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THE METAL WORKER.

NEW YORK AND CHICAGO.

Saturday, July 1, 1893.

DAVID WILLIAMS, - PUBLISHER

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Practical Charity.

The truth of the old proverb, "Heaven helps those who help themselves," is inc ontestable, and the best method for putting helpless men into the way of becoming self-reliant, useful citizens is to teach them to help themselves. Such a wise effort is that of the Baron de Hirsch Trade Schools of New York, for training destitute Russian Jews in useful handicrafts, of which institution we give some account in another column of this paper. This establishment is a branch of a great enterprise instituted by the distinguished Hebrew philanthropist above named, by which he seeks to improve the condition of his fellow-religionists who have been driven from their homes in Europe, and who too often land in America destitute and friendless, without knowledge of the language or any means of livelihood; and this through no fault of their own. Just at this point the younger men and boys find a means provided for them by which they can learn a useful trade, which will give them an assurance of independence in the future. They are generously assisted during their time of pupilage, if necessary, by free provision of food, clothes and shelfer, and at the end of their term of instruction are helped to obtain employment, and launched upon their new life well equipped to become useful citizens of their adopted country. It is not proposed that the men so trained shall be turned out to swell the already overcrowded ranks of labor in our Eastern cities, but they are encouraged to go further afield and fill gaps in the newer portions of the Republic, where their services are really needed. The large-hearted, practical benevolence of the wealthy members of the Hebrew race toward their poorer brethren has often been signally instanced both in Europe and the United States, and in no case more brightly than in the institution we allude to. It differs, of course, from most of the trades schools of this country, in that it is a purely charitable institution, but it is charity on a common-sense basis which deserves consideration, for there is a wide field for similar work outside the Hebrew race.

The Workman and the Fair.

One of the greatest misfortunes to the country at large that will result from the incorrect impression of exorbitant cost of seeing the World's Fair is the effect of this impression on the working man. It will prevent many from making the effort to see it and deprive them of a great pleasure. The pleasure lost is a comparatively small matter, but the amount of invaluable information that might be obtained by the sightseer, whether he be workman or tradesman, in examining exhibits and watching processes of manufacture, is incalculable. In grasping the magnitude of the exposition as a whole or in detail there is an incentive to progress and an inspiration to attempt greater things that is priceless. The value of an object lesson is generally understood and the fair is an object lesson of infinite diversity. Of the millions who will gaze on its wonders each will gather some valuable impression to be used advantageously at a later period, and the amount of knowledge thus disseminated could be imparted in no other way. A notable feature of this fair to those who have had experience is the number of persons who are examining goods of all kinds with a business end in view. These inquirers come from all nations and an interpreter is not an unusual companion. Many are seeking information with the idea of taking samples abroad and making sales from them, and not a few exhibitors report some very satisfactory orders.

A Bright Sheet Among the Ternes.

After the Tin Plate Association at Pittsburgh had been disappointed in their endeavors to secure the necessary contributions to make an ideal exhibit of the industry at the World's Fair it was deemed advisable to discontinue the effort. On learning this decision, about April 14, H. T. Duff of the Irondale Iron & Tin Plate Company, urged and aided by some friends, started to secure space and material. On writing for help ten different houses responded and Mr. Duff has been able to make a very handsome showing with the material received and no doubt other additions will arrive from time to time that will make the exhibit still more interesting. The location of the exhibit in the gallery of the Mines Building is unfortunate and due to the fact that it was the only space available at the late date Mr. Duff took hold of the matter. It has been suggested that the courtesy be asked of some of the exhibitors of tinware, metal shingles, stoves and plumbing goods to hang a neat sign at some conspicuous place on their exhibit stating where the tin plate exhibit is located, so that the tinner and others interested visiting the fair may be sure to find it.

Some Interesting Experiments.

The statement that radiant heat passes directly through air without heating it, and that the latter is heated by stoves, furnaces and other heating apparatus only through its contact with the heated surfaces, has been difficult for many persons to comprehend, and, consequently, there are still to be found in the heating business those who either flatly deny the truth of the proposition, or, if they do not venture to deny it, secretly discredit it. The statement is, however, not only true, but it is important in its practical applications in the art of heating buildings, in greenhouse heating, and in other industrial arts. Some interesting experiments bearing upon this subject have recently been performed in France. Though these experiments were carried out for an entirely different purpose, they afford very striking proofs that air is not warmed by radiant heat.

Temperatures at Great Altitudes.

The experiments referred to consisted in taking the temperatures, both in and out of the direct rays of the sun, at hights of 9, and even 10 miles and upward, by means of self-registering thermometers, carried to these hights by small balloons; the hights reached by the balloons being determined by the indications of self-registering barometers. Ingenious devices for protecting the instruments when they descend from these great elevations were provided, and in the instruments employed, where metal work was required, aluminum was much used on account of its lightness. Now, by these experiments it was found that while the direct heat radiated from the sun at the hight of 10 miles is much more intense than it ever is upon the earth's surface, the temperature of the air is intensely cold, often reaching 58° below the Fahrenheit zero. This proves that the air is not warmed by the direct heat of the sun; and that the air near the earth's surface is warmed only by coming in contact with the surface itself and the objects upon it, these all being heated by the sun's direct radiant heat, that passes through the intensely cold stratum of

air above till it reaches and is partially intercepted by clouds and vapor of water at much lower hights. It has been asserted that were it not for the constant presence, even in the clearest atmosphere, of the vapor of water, the direct radiant heat of the sun would be unbearable by man, while the temperature of the air might at the same time be below the freezing point of water.

The Pig-Tin Duty.

From to-day goes into effect the duty of 4 cents a pound imposed on pig tin under the McKinley bill of 1890. As will be remembered, a bill for repealing the provision relating to this metal was presented to the last Congress and its passage was believed to be secure. In fact, an announcement to the effect that it had passed at the close of the session was erroneously made. It turned out, however, that in the hurry attendant on the closing hours of the session the measure had failed to pass the Senate, consequently the pig-tin clause stood, and has now become operative. This portion of the bill directs that a duty of 4 cents a pound shall be paid on all imported "cassiterite or black oxide of tin, and bar, block and pig tin," from July 1, 1893; the duty to be raised and the material admitted free after July 1, 1895, unless the product of the mines of the United States shall have been shown to have exceeded 5000 tons of tin in any one year prior to that date. The expectations formed for domestic tin at the time the tariff was framed have, admittedly, not been realized; and it is generally regarded as certain that the duty on pig tin will be repealed during the coming session of Congress, although matters of more paramount importance, such as the silver question, may prevent attention being devoted to the subject at any very early date. Meanwhile imports of pig tin have been unusually large this year. The following figures show approximately the receipts and consumption of the metal since January 1 last:

	Tons.
Tin in warehouses on January 1, 1893.	4,270
Arrivals to May 31	12,930
	17,200
Consumption to May 31	8,200
Tin in warehouses on June 1	9,000
To arrive during June	2,500
	11,500
Estimated consumption for June	1,500
Stocks in hand on July 1 about	10,000

Thus it will be seen that the estimated "visible" supply existing to-day in the warehouses of the United States is amply sufficient at the average rate of consumption—namely, 1500 to 1600 tons a month—for all requirements during the next six or seven months, before the end of which, it is believed, the duty will have been raised. The market for pig tin is at present in a curiously depressed condition, owing, it is said, not to any diminution in the general demand, but because of the prevailing tightness of money, preventing the purchase by dealers of more stock than they can dispose of out of hand. Prices now ruling—namely, 19.50 cents for July deliveries and 19.85 cents for August—are the lowest since last fall, and with the unusually large stocks in hand no prospect of immediate improvement is visible.

The Ferris Wheel.

Of all the engineering novelties projected in connection with the World's Fair, the Ferris wheel is the only one that has been carried to completion. The great success of the Eiffel tower at Paris, both mechanically and commercially, stimulated American inventors and engineers to attempt something equally noteworthy at Chicago. Many of these schemes have been described in our columns. One of them was the Jenison tent, with a center pole 1492 feet high and a steel and glass canopy large enough to take in the entire World's Fair exhibits. Another was the Morrison tower, in many respects resembling the Eiffel tower. A third was the Johnstone tower, 560 feet high, with an electric railroad winding about it spirally from the bottom to the top. All sorts of fantastic schemes were also exploited in the newspapers, but these were the only ones considered seriously by practical people until the Pittsburgh engineer, G. W. G. Ferris, conceived the idea of an enormous revolving wheel, with a large number of cars suspended on its periphery. It was one of the last schemes to be brought out, but it proved sufficiently practical to attract capitalists, and it was carried through.

The principle of the wheel is not a novelty, being merely the familiar revolving wheel of the summer resorts on a colossal scale. The plan upon which it is built is, however, a novelty in constructive engineering, and the daring builder is worthy of as high praise as Eiffel, who also merely advanced further than any of his predecessors in the building of towers. The construction of a great circular frame work of steel, 250 feet in diameter, so thoroughly braced as to resist any possible wind pressure, and so well balanced as to be moved easily on its axis, was a task calling for the highest mechanical ability. Further than this was the financiering of the scheme, probably more difficult to accomplish than the details of construction. Mr. Ferris has won fame in both respects. The rapidity with which the wheel was built is another triumph of his genius. Not a pound of the steel for its construction had been ordered in January last, and the foundations were not begun until well toward spring. The middle of June sees the whole work completed and in regular operation earning a revenue.

The Ferris wheel will undoubtedly be the special feature of the fair that will be vividly remembered by the millions of visitors. Even those who are too timid to venture to take a ride in one of its cars will be interested in its curious appearance and will visit its site to take a closer inspection of the greatest single piece of mechanism ever put in motion. It is a superb work and deserves to retain its place long after the memory of the exposition of 1893 has faded.

Cost of Seeing the World's Fair.

BY L. M. W.

The Centennial being frequently used for comparison, Philadelphia will be the point from which the cost is computed. This estimate is made in the interest of the wage worker and not the salaried official. Consequently luxury will not be considered, and bearing with some disagreeable things will be necessary. A ticket from Philadelphia to Chicago, good for the return trip, can be bought for $25. Now, as the journey will probably take two nights and one day, the question of eating must be considered, and a good supply of substantial provender can be brought from home in a pasteboard box, or $2 can be set down for this purpose. Where are you going to live is a question that should be decided before you leave home by writing to the Bureau of Comfort, Rand & McNally Building, Adams, Quincy and La Salle streets, Chicago, or to L. H. Lee, care of Young Men's Christian Association, 148 Madison street, inclosing a stamped envelope for an answer, and saying that you want a clean, comfortable room for $1 a day, or for as much less as a good room can be had, and there is no doubt but they can direct you to good accommodation at this figure. They will tell you how to reach the place from the station where you arrive, or a policeman will render you the same service. The same source of information will direct you to good table board, or you can find a restaurant of reasonable charges, and if you select a plain substantial bill of fare $1 a day will keep you well fed. Now, it costs 50 cents a day to get into the fair, and another 50 cents a day for car fare, incidentals and souvenirs will enable you to see all of the main and important exhibits. A walk through Midway Plaisance in the morning will let you see all that is really necessary of it.

Now, if you stay at the fair six days these last items will amount to $18, and added to the price of the ticket and lunches both going and coming it will amount to very nearly $50.

By the use of the same business judgment and foresight that you use every day at your trade or in your business you can get good plain respectable lodging and living and see one of the greatest and most interesting displays of what man, and probably only an American man, can accumulate. No matter whether you are a tinner, a plumber or any other kind of a mechanic or a clerk, it will pay you to see the World's Fair, and it is the cheapest and best education you will ever get at the price estimated, but if you want to spend more there is ample opportunity.

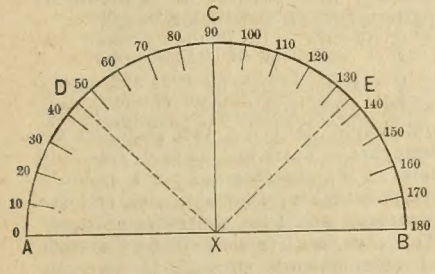
Evidence of the depressed condition of shipping business is given in the returns of transit revenues collected by the Suez Canal Company for the first four months of this year. The total receipts amounted to $4,685,966, as against $5,364,730 received in the corresponding period of 1892.

THE LETTER BOX.

Elbow Angles.

From M. A. D., *Neenah, Wis.*—I wish to inquire if there is any reason for designating elbows as they are generally listed. For instance, an elbow having an angle of 135° is indicated in list as a 45° elbow.

Answer.—The above question having been submitted to a prominent manufacturer of elbows, he replied as follows: The circumference of a circle being divided into 360 equal parts, each



Elbow Angles.—Fig. 1.—Semicircle Divided for Measuring Angles.

of these parts is called a degree. The semicircle, as shown in Fig. 1, is thus equal to 180°, and the quadrant or right angle to 90°. If the arc of a quadrant is divided into two equal parts, and a line drawn from this point to the center, we obtain one-eighth of the circle, or 45°. As 90° represents one-fourth of the circle, or a right angle, a right-angled elbow is designated as 90°. As 45° represents one-eighth of a circle, and as eight of the 135° elbows, as your correspondent calls them, placed together would represent a circle, one of the latter is designated as 45°. In the same manner, 12 elbows

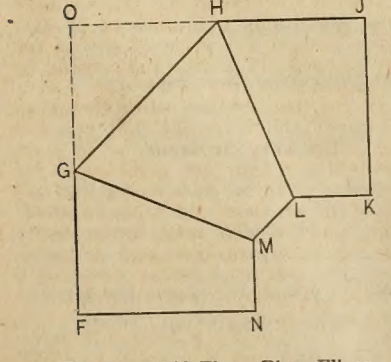


Fig. 2.—A 90° Three-Piece Elbow.

of 30°, or 16 of 22½°, would be required to form a circle. Two 45° elbows placed together would equal a right angle, or 90°. Two 22½° elbows would be equal to one of 45°, &c.

Such is the method usually adopted by the trade for designating the angles of elbows, and while it may be difficult to give a precise reason, the custom appears to be sanctioned by usage. Yet it is not the proper method, as can be seen by referring to Fig. 1. In this diagram the semicircle A C B is divided by tens into 180°. The angle formed by A X C, or C X B is a right angle, or 90°. If we bisect the right angle C X B by the straight line E X, E X B or C X E will represent an angle of 45°. If we bisect A C in a similar manner, the angles A X D or D X C are also of 45°. If an elbow was made as indicated by any of these angles, as A X D or E X B, it could be called a 45° elbow. If the elbow is made at an angle as indicated by A X E or D X B, it must be evident that the elbow is at an angle of 135°. In Fig. 2, let F G H J K L M N represent a right-angled elbow composed of the three pieces F G M N, G H L M and H J K L. It is evident the angle F O J is a right-angle, or 90°. On the other hand, an elbow having the angle indicated by F G H would be of the same angle as A X E in Fig. 1, or 135°. If 12 elbows when placed together would represent a circle, one of these elbows should be called a 150° elbow, and not a 30° elbow. Also, if 16 elbows would be equivalent to a circle, one of these elbows should be called a 157½° elbow, in place of designating it as one of 22½°.

Laying a Tin Roof.

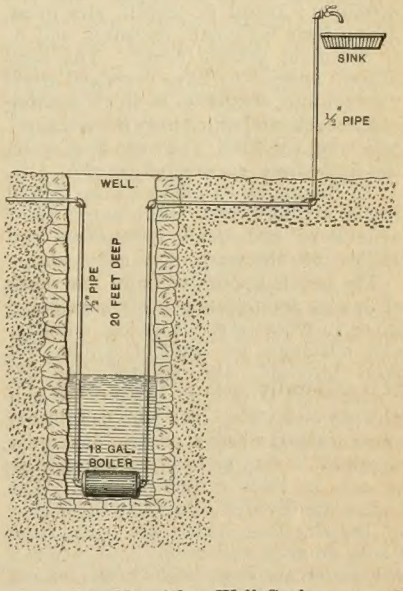
From C. S. P., *Brinkley, Ark.*—I would like to be informed regarding the proper method to use in putting on a tin roof, 50 x 80 feet, with 4 feet fall in 80, laid with flat seam and soldered. Is it best to lay the tin on roof one sheet at a time, or put it together in sections in the shop, and then lay the sections on the roof? My experience with putting tin together in long sections has been that it is difficult to get them sufficiently straight so they will lock together properly when being laid.

Answer.—When a flat seam tin roof is to be put on, we think the best results are obtained by laying it sheet by sheet, each sheet being secured to the roof boards by means of cleats. We should be pleased to have our readers give their opinions regarding the two methods mentioned by our correspondent.

Trouble with a Well Cooler

From P. R. F., *Virginia*—I did a job last summer which has not given satisfaction, and perhaps you can explain where the difficulty lies. The water mains here are not over 18 inches deep, so that in summer the water becomes very warm. I put an 18-gallon boiler in the bottom of a well and connected the supply pipe from the main to one end and ran a pipe to the sink from the other. The water, however, is as warm as if it never had run through the boiler, and I am puzzled to know why this is so. The accompanying sketch shows the general arrangement.

Note. — We have reproduced the sketch sent us by our correspondent, and will be glad to have any of our readers who may be experienced in this line tell what the trouble is. If the water is not drawn continuously from the faucet, but has ample time to cool in the 18-gallon tank down to the temperature of the well, we fail to understand why it should be so warm at the faucet. It is possible that our correspondent does not let the water run until the liquid that has been standing in the pipe between the sink and the boiler is discharged. This, of



Trouble with a Well Cooler.

course, is warmed to the temperature of the house or air. After this has been expelled, however, the cooler water from the boiler ought to flow. It is barely possible that the two pipes in the boiler may be so close together that when the water flows the warm water from the main passes through the boiler and rises in the discharge pipe without displacing the cooler water in the reservoir. This would not happen under ordinary conditions, but there is a chance that there has been some mistake in arranging the boiler connections.

The *American Shipbuilder* states that the Harlan & Hollingsworth Company of Wilmington, Del., have taken the initial step among American shipbuilders in preparing for free-trade legislation by the next Congress, by asking importers of English steel ship plates, angles and beams to quote them the lowest obtainable price for these materials laid down at their works or delivered in New York or Philadelphia.

A Jewish Trade School in New York.

Among the manual training institutions of the city of New York is one of comparatively recent date, which differs from all others now in operation here in that the instruction given is entirely gratuitous, and that the pupils are all Russian and Roumanian Jews. The school in question is a detail of the vast scheme of beneficence initiated by the eminent Hebrew philanthropist, Baron de Hirsch, to ameliorate the condition of his oppressed co-religionists from Eastern Europe who have sought shelter in the United States. This scheme includes the settling of Jewish colonies in the Argentine Republic, in Vineland, N. J., and in other parts of the American Continent, which colonization has been accomplished with more or less success.

The manual training establishment known as the Baron de Hirsch Trades Schools, was inaugurated nearly a year ago in a large building erected for the purpose at 225 East Ninth street. It is under the general direction of the Central Committee appointed to manage the Baron de Hirsch fund, of which committee ex-Judge M. S. Isaacs is president; Jacob H. Schiff, vice-president; Jesse Seligman, treasurer, and A. S Solomon, general agent. The committee appear to have exercised great wisdom and discretion in the launching of these schools, which have proved a success from the first. They are now under the immediate superintendence of Col. J. E. Bloom, an ex-officer of the United States artillery, who has brought some experience and much enthusiasm and ability into the work of management.

The pupils are drawn from the ranks of Jewish immigrants, preference being given to recent arrivals in the country, and although no limit of age has yet been imposed, the majority of the students are boys from 14 years old and upward and young men who have either never learned a trade or who have only acquired a very elementary knowledge of one in their former country. The classes are divided into two; those held in the daytime, which are open from 9 a.m. to noon and from 1 to 4 p.m., and which are composed of the element above referred to, and the evening classes, open from 7 45 to 10 p.m., which are mainly attended by young men who are occupied as helpers in their trades during the day, but who wish to improve their knowledge in them by more direct instruction during their leisure hours. It is endeavored to limit all classes so far as possible to those men and boys who have not been more than two years and a half in the country.

PLUMBING AND OTHER TRADES TAUGHT.

The trades taught include plumbing and gas fitting, artistic metal work and electro-plating, sign and fresco painting, machinists' work and mechanical drawing, carpentry and wood turning and wood carving. Each class has either one or two instructors, those for the day classes usually assisting the evening teachers, who are otherwise occupied during the day, and who generally give instruction in the more advanced stages of work, their pupils having, as a rule, already mastered the elementary principles of their trades. The plumbing and gas-fitting classes, both day and night, are, however, under the care of a permanent instructor, B. Bedanes, a graduate of the 1885 class in the New York Trades School. The average attendance at both these classes is from 16 to 20, the number of students being limited to the latter figure on account of restricted accommodation. The evening class in plumbing might easily be multiplied by three or four, we are told, did considerations of space not forbid. The work done by the beginners in the day class is very creditable to their instructor, who states that it is surprising how quickly these Jewish lads, who have often never seen any plumbing work in their lives, pick up the use of the soldering iron. They can, it is said, learn to make a seam or wipe a joint in much less time than is generally taken in mastering the operation by their Gentile brethren. Instruction is given on essentially similar lines to those used in what is known as the Auchmuty system, as practiced in the New York Trades School. Indeed the whole organization is founded upon the excellent principles made use of in that successful institution.

The sheet-metal class is mainly instructed in the production of small fancy objects in brass and copper, many of which are very beautiful in design and execution, approaching to jewelers' work. A very attractive exhibit of the work done in this class has been sent to the World's Fair.

Carpentry and wood turning is a very favorite branch of study with the Hebrew immigrants. Many of the articles of household use produced by them are used in the de Hirsch colony at Vineland. The classes for sign and fresco painting are also well attended, and no difficulty has yet been experienced in keeping all the departments of instruction full of pupils. In fact the managers are in a quandary as to the provision of sufficient space to accommodate all the deserving applicants for a place in the schools. At present they are obliged to exercise their discrimination in the matter.

GENERAL ARRANGEMENTS.

The course of instruction in all trades is nominally six months, but certificates are granted to men who show the necessary proficiency after as short a period of study as three or four months. The certificates issued are merely recommendations stating that the bearer has had so many months' instruction at the schools and is recommended as a diligent worker, the form being as follows:

BARON DE HIRSCH TRADE SCHOOLS.

No..... 225 East Ninth street, New York.....

THIS IS TO CERTIFY *that the bearer*.....

aged..... *years, has had*..... *months' instruction*.....

in our department of.....

He is especially competent in.....

.....

We recommend him as a diligent, faithful worker. If you give him a trial, please report to us his progress and deportment from time to time.

Yours truly,

....

Instructor. *Manager.*

N. B.—If the bearer is not acceptable, kindly return this certificate with indorsement, stating your requirements—either in this or other department.

During the first year's existence of the institution these recommendations have been given to 58 graduates who, we understand, have all secured lucrative employment, many of them in distant cities.

It is the aim of the management to locate their students so far as possible outside the city of New York, in places where the labor market is not overstocked, so as not to compete with the large demand for employment existing here. In this way they believe they can benefit both the men and the country at large by providing capable workmen to establishments situated in places where skilled labor is not easily obtained, especially in the newer portions of the Western States.

Another object which Colonel Bloom has in view is the teaching of American methods of work to those Jewish immigrants who have learnt a trade in their former country, but who find its conditions here to vary from the practice they have been accustomed to. This, it is believed, can be done in a very short space of time.

A labor employment bureau is also in contemplation in connection with the schools, and other additions and improvements, including classes in house painting and papering, boot and shoe making, and possibly in sheet-metal pattern cutting and tinners' work.

SYSTEM OF MARKS.

A system of marks is in operation which gives a standard of ten marks obtainable daily by the pupil in all branches. These are made up as follows: 5 for character of work done, 2 for punctuality, 2 for attention and deportment, and 1 for general cleanliness. This plan, with a very efficient system of office records showing the particulars of each individual and the work done by him, was arranged by Colonel Bloom, and has just been adopted.

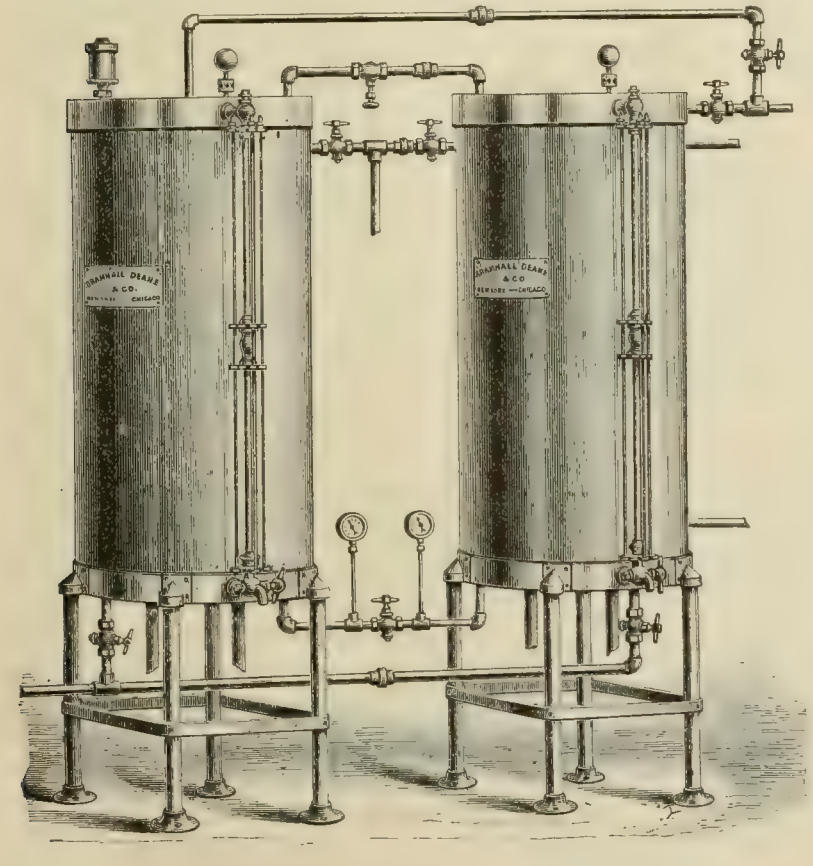
One great disadvantage under which the newly-arrived scholars generally labor is their total ignorance of the English language. Most of the instructors are, however, able to communicate with them in their own tongue, and the pupils of the day classes—who are the only ones so situated—are obliged to attend the evening classes for the study of English at the Hebrew Institute on Broadway. No man is given a certificate from the school until he has a competent knowledge of the English language. The manager says that most of them pick it up in an astonishingly short space of time.

The poorer boys, who have no friends or means of support in this country during their term of pupilage, are sheltered at a lodging-house, also under the direction of the Baron de Hirsch fund. Here they are housed, fed and clothed gratuitously, and at the end of their term are, like all the other graduates, found employment which will make them self supporting.

LECTURES.

Every Saturday evening a lecture of some sort is given on some interesting or instructive mechanical or trade subject. Occasionally literary or musical entertainments with stereopticon views are provided. For the benefit of newcomers, ignorant of English, the lecture is sometimes interpreted into Russian. Some able speakers have been secured for this purpose, and this feature is much appreciated. On the first Saturday in June Col. A. S. Bacon spoke to the pupils about the West, and the advantages offered by that part of the country to steady men and skilled workers.

The courses commence the first Monday in each month the year round. New pupils are then received, and started on their term of from three to six months, according to the progress in proficiency which they display.



Apparatus for Automatically Sterilizing Water.

Water Sterilizing Apparatus.

Bramhall, Deane & Co., 262–266 Water street, New York, are manufacturing several forms of sterilizing apparatus, one of which is here illustrated. This device is designed for sterilizing water for drinking, cooking and surgical purposes. It may be used with steam or gas and can be made either portable or stationary. It automatically sterilizes water under pressure, giving any required temperature, and makes it practicable to draw sterilized water for use without exposing it to contact with unsterilized air. The materials used in its construction may be of copper, composition or non-corrosive metals, and nickeled or silver plated. The smaller apparatus have appliances for being heated with gas. Those of large capacity are arranged to receive steam generated elsewhere for sterilizing. The cut shown represents apparatus of 100 gallons capacity. The cylinder at the left has an interior steam coil, which is surrounded by the water (which has first been filtered) to be sterilized. After being sterilized it is forced under pressure into the tank at the right, where it is cooled. Connections are made enabling the user to draw hot, cold or tempered sterilized water at any point to which pipes have been laid, or at the faucets shown in the cut. The customary water and pressure gauges, safety valves, tell tales, &c., are attached, as well as an overflow to prevent any excess in the sterilizing tank. Bramhall, Deane & Co. are manufacturing several other styles of apparatus for sterilizing bandages, dressings and instruments for use with steam, gas or lamp, suitable for private practice, hospitals or other institutions.

Notes from Indiana.

THE BRUCE & MARKS MFG. COMPANY,

Gas City, Ind., recently started their plant at work making grass hooks, which they are now turning out at the rate of 1000 a day, though their capacity will be more than double this when the whole plant is in operation and all the machinery and hammers are set up. Their steel comes to them rolled in special shapes, from which their patented hooks are made. Hay and corn knives will be added to their productions as the season advances. Chas. H. Marks attends the manufacturing, having had many years of experience with the implement makers at Auburn, N. Y.

THE WESTERN BRASS COMPANY

of Gas City are just getting to work in a new plant for making gas fixtures, chandeliers and brass fittings. This is a branch of their works at Bridgeport, Conn., and Whitehall, Mich., and the line of goods made in Gas City will be principally for gaslighting.

MOREWOOD & CO.

The erection of their tin-plate manufacturing plant at Gas City has been very much delayed by the weather which prevented their railroad siding being run in and so prevented them getting materials. The buildings, however, are now all up and the tinning stacks also. The size of the buildings, the number of them and the space they cover all indicate a large producing capacity and show that experienced judgment was displayed in their arrangement. No undue haste is being used in getting into operation, but as the machinery is now arriving and being set up it is fair to suppose they will be ready for early fall trade.

THE ELWOOD IRON WORKS,

Elwood, Ind., have two plants, the one on the north side being new, and is just about starting to make radiators for the Holland Radiator Company of Chicago. The older plant consists of a foundry and machine shop, where they make gate valves and fittings for natural gas work, and has been considerably occupied in making annealing boxes for black sheets for the tin plate plants, an improved tinning machine for both bright and terne plates, a cleaning machine for running the coated plates through bran and a duster to remove anything from the coated surface before it is sorted and boxed.

THE AMERICAN TIN-PLATE COMPANY.

Another tinning stack has just been put in operation at Elwood, and in order to turn out the black sheets faster a mill to roll the billets to tin-plate bars is now ready to start, and a furnace for heating the billets is ready for use. The superintendent, W. H. Banfield, is more than pleased with his improvement in the tin plate mills, which has increased their capacity.

THE AKRON FORGE COMPANY

of Akron, Ohio, have just broken ground at Elwood for a branch of their works. The building is to be 70 x 240 feet, and will be pushed to an early completion to get the benefit of gas.

THE INDIANA TIN-PLATE COMPANY,

Atlanta, Ind., enjoy a supremacy in manufacturing, being the only plant in that town to attract wide attention. Under the experienced supervision of Enoch Stanford, the plant is running in a conservative and satisfactory way. They were annoyed recently by the tank of one of their tinning machines cracking, which necessitated the delay incidental to putting another new stack at work.

THE PERFECTION MFG. & SUPPLY COMPANY,

at Tipton, do a general foundry and machine business, but make a specialty of a straightway, quick opening valve for natural gas. These valves are called on to stand a gas pressure of 350 pounds to the square inch in use, and in some sections the pressure has been as high as 500 pounds, but so high a pressure seldom continues.

Lord Thurlow, chairman of the Harney Peak Tin Mining Company, is reported to have said that operations will be resumed at the mines by October 1.

PLUMBING and GAS FITTING.

Plumbers' Examination.

From P. J. R., *New York.*—Having a job in New York I am receiving quite a number of letters from friends that I have made among the plumbers while working in different parts of the country, asking me to send them the questions used by the Examining Board in New York, according to the new law that is now in effect. As there were so many I concluded I would send my letter to *The Metal Worker*, dropping them a postal to watch for it; and if they are disappointed in never seeing it, it will not be because I never wrote it. The examiners are good practical plumbers, and have too much good judgment to adopt a series of questions that some fellow would give away, so that answers could be got and enable the very ones to pass who ought to be weeded out. The examiners render the citizens a very efficient service, and yet are just in the plan they follow. The questions are many and rigid, or few and leading, according to the ability, acquaintance with the subject and general knowledge a man displays in his answers. The plumbers in any neighborhood can greatly benefit themselves if they will all meet, bosses and apprentices, some evening, and select three judges who shall ask questions that may be answered by any one in the meeting, not allowing over five minutes to a subject. Questions like these might be asked, and would prove of interest to all:

How should a double boiler be connected?

What descent should a sewer pipe have?

Where and how should the main sewer be tapped, to connect a drain?

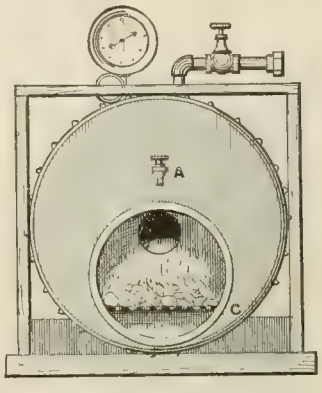
Where would you start to plumb a building?

From the answers a plumber would make to such questions a good idea of his ability could be determined by a committee of practical working plumbers, whether appointed by law or selected by friends, and much valuable information could be acquired by the boys. Such a meeting would be very similar to the examinations in any city under the new law, and if followed up with a lively interest would be of use to all concerned.

Thawing Frozen Street Mains.

There was printed in *The Metal Worker* of April 1 a communication from "S. I. D.," Canada, describing his method of thawing frozen street mains. Another correspondent writes us later, asking if he could not obtain a description of the boiler used for the purpose. We have in reply to this inquiry the following communication from "S. I. D.:"

There are quite a number of different kinds of boilers that can be made from sheet iron for the purpose. Before the plumbers' gasoline furnace came into use I made one like the old fashioned Cornish boiler, with fire hole surrounded by water, in which we burned charcoal, wood chips, &c. It was made cylindrical, as shown in Fig. 1, about 10 inches in diameter and 8 inches deep. A is a ¼-inch pet cock, from which we could tell the hight of the water in the boiler. A ¼-inch globe valve was placed in the pipe to shut off the steam. C was a grate made of wire netting of about ½-inch mesh. A door was placed in front of the fire hole and a 2-inch smoke stack, which is not shown in the illustration, was provided. It was mounted on a



Thawing Frozen Street Mains.—Fig. 1.—*Section through Horizontal Boiler.*

base and cased with ⅛-inch hardwood, as shown, to protect it from injury.

This was all very well when we had nothing better, but it was much more convenient to use a gasoline furnace, and I will try and show how to make a boiler for use in connection with one. It is the simplest kind I know of, and will answer the purpose effectually. Take a piece of galvanized iron, No. 18, 10 x 20 inches, and form it into a cylinder, giving about 1 inch lap for

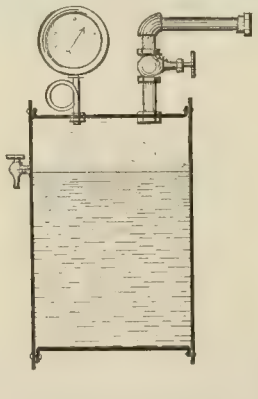


Fig. 2.—*Section through Vertical Boiler.*

seam, which must be riveted closely. This would be about 6 inches in diameter when formed up, and 10 inches high. Make the ends 4¾ inches in diameter, and turn up 1 inch all around, as shown in Fig. 2. Fasten a ⅜-inch nipple in top of the boiler by means of two lock nuts, as shown, for the steam pipe, and repeat the process for a steam gauge. Place another in the side, about 2 inches from the top, for a pet cock, which is used for filling the boiler, as well as for blowing off the steam, &c. The ends of the boiler are riveted in, as shown, and after that all the seams are heavily soldered. A ¼-inch globe valve is placed on the steam pipe, pretty close to the boiler, with a nipple and elbow for making connections by means of a union with a ¼ inch coil of lead pipe. A very low pressure is sufficient to thaw out most pipes, as they are frozen in a great many cases where they pass through a stone wall, and this is a place difficult to reach by any other method than that described in *The Metal Worker* of April 1. Fill the boiler with water by taking out the pet cock in front, and use a funnel with a tube at the end bent sideways. When the water level is up to the hole screw in the pet cock again, and set the boiler on top of the furnace, which will soon give enough heat for the purpose. I made other kinds of boilers, which would heat quicker, but were, of course, harder and more expensive to make. In this one there are very few joints, and consequently it is more durable.

Note.—The above is an interesting account of an apparatus for thawing frozen pipe, but it must be borne in mind that a home-made boiler of this kind is not adapted to high steam pressure, and it must be used with care. If the pressure rises above a very small amount it will not do to keep the valves shut. We think our correspondent would have done well to provide his home-made boiler with a safety valve to blow off at low pressure. Steam is a dangerous thing to handle, unless provision is made for its escape in case of too great strain on the boiler. Bearing this point in mind, however, we think that the description of boiler shown may be of service to many in the plumbing trade.

The Management of Office and Shop.*

BY ALFRED HOPKINS, BRIDGEPORT, CONN.

What I have to say regarding the management of the workshop, salesroom and office will be only a brief outline of suggestions. Some of these suggestions will be reiterations of time-worn remarks, but as "keeping everlastingly at it" has done wonders in the past, I believe it to be a potent factor in the elimination of evils of the present.

To contrast order and chaos, well lighted premises and dingy apartments, cleanliness and dirt-encumbered floors and counters, is not my intent. If there are any in our craft who cannot see the advantages possessed by the first named of each of the conditions contrasted it would be far from my desire to effect a change. Nothing short of the millenium itself would be capable of doing anything like that.

Of the treatment of workmen in one's employ, the less said the better, since the individual peculiarities of persons are so dissimilar that no set rules can be laid down for general guidance. A quiet determination gives by far the best results. It is to be

* Presented at the Milwaukee convention of the National Association of Master Plumbers.

borne in mind, however, that politeness on the part of both the employer and the employee is to be encouraged, but beyond that politeness, all which tends to make undue familiarity is to be avoided. While it is well, of course, to have the good opinion of all those in one's employ, it is also desirable to remember that a master who is too easy in his methods of discipline is likely to have as little work done as the hard task master who is unnecessarily harsh. Like all things else, there is a medium between the extremes.

Where a foreman is employed he should be given entire charge of the work over which he is placed, and should be held strictly accountable for the quality of that work. If not, what is the use of having a foreman? Would his salary not be a dead loss?

The slip-charge method, which consists in the employee writing on a slip and giving it to the man at the office for the materials used on each job he works upon, is the best known method of preventing troublesome differences between the customer and one's self. Where more than one day is put upon a job, all material used the second or subsequent days is to be entered upon another slip and properly dated and signed with the initials of the workman, when the job is completed, all material returned to the shop is to be credited upon a similar slip (but of different color), and the result of the slips figured and added in a book for the purpose, is the easiest mode of proving material used which has ever come to my notice.

The time is to be disposed of in the same way, except that one day each week, preferably Friday, the workman wait after hours a few moments and give in the time spent on the different jobs for the previous week, and this is entered upon a time book, which keeps a separate account with each man, and besides saving delay on pay day, it is a certain preventive of paying for time not given by the workman, for only what time he accounts for is credited to the account of the man on the time book and no danger is experienced of being unfair.

The forgetfulness of workmen in failing to ask for material needed until the very moment it is required is annoying in the extreme. It can be avoided by compelling each man to write out a list of stock required for his next day's work which is not in the shop. The failure of the workman to do this results in his being laid off until the stock arrives. Once doing this is usually enough to sharpen his memory.

The importance—particularly with new and prospective customers—of a clean salesroom and neatly dressed salesmen cannot be overestimated, and their importance toward the general summary of business prosperity the merchant cannot afford to overlook.

Another point is the having in sight and in form for operation the various devices to be sold. Illustrated catalogues are for old-timers. The device itself and in operation is the modern way of doing business. The device may be on hand, but if dust covered and generally unattractive the sale drops through.

Our traveling salesmen will bear witness that a clean office is a certain sign of commercial prosperity; 50 years ago one did not mind a little dirt in a corner of a shop where the books were "kept," but to-day, the customer may be stylishly dressed and in light fabrics, and wants a clean office floor and unobstructed chair while he talks business. A file of latest catalogues and price-lists in order and at a convenient place adds wonderfully to the force of an argument with a customer.

The longer the interval between the completion of work and the sending of a statement of the same, the more likelihood of differences and consequent loss of custom. By sending a statement at once, alleged errors can be straightened out and general harmony prevail. The sending of such a statement should not be taken to mean a "dun," but merely for the purpose which is attained when a manufacturer sends a shipping statement. Attention to this detail may mean hundreds or even thousands of dollars in one's pocketbook.

I might go on indefinitely giving these little suggestions, but with one more I shall close. What I wish to impress upon the minds of the craft is that the lavish use of a letter copying press never did any harm and yearly does untold good. A copy of a letter takes no room in a letter book; a contract is easily copied, and if even in ten years after it is brought into question, the law has decided a letter copy made by sympathetic ink to be "original evidence" when the letter itself is missing. Great pecuniary loss often results from failure to use a copying press.

TRAPS AND VENTS.

FRED ADEE & CO., 90 Beekman street, New York, are putting on the market the Duplex water closet, which they describe as a combination of the best features of the Capital and A.D. They say it will work well if the cistern is placed any hight, from 3 to 7 feet above the closet, and if the flush pipe, which should be 1½ inches, is straight, or made with elbows or flush bends, 1 or 6 feet. Its noiselessness is a special feature referred to.

NOTICES HAVE BEEN ISSUED to the trade stating that the Mercer Pottery Company, Trenton, N. J., have purchased the business of the Beekman Salutary System of New York, and the Smith & Anthony Stove Company have been made their sales agents. The latter firm have a large and spacious store at 56 Beekman street, New York, where they exhibit the Beekman whirlpool wash-out closet along with their Sanitas specialties and other plumbing supplies.

MAYOR WHELAN of Troy, N. Y., has appointed as members of the board of examining plumbers of that city William Ferguson, Martin Mulligan and Michael J. Flannery. They will soon proceed to examine the plumbers of that city.

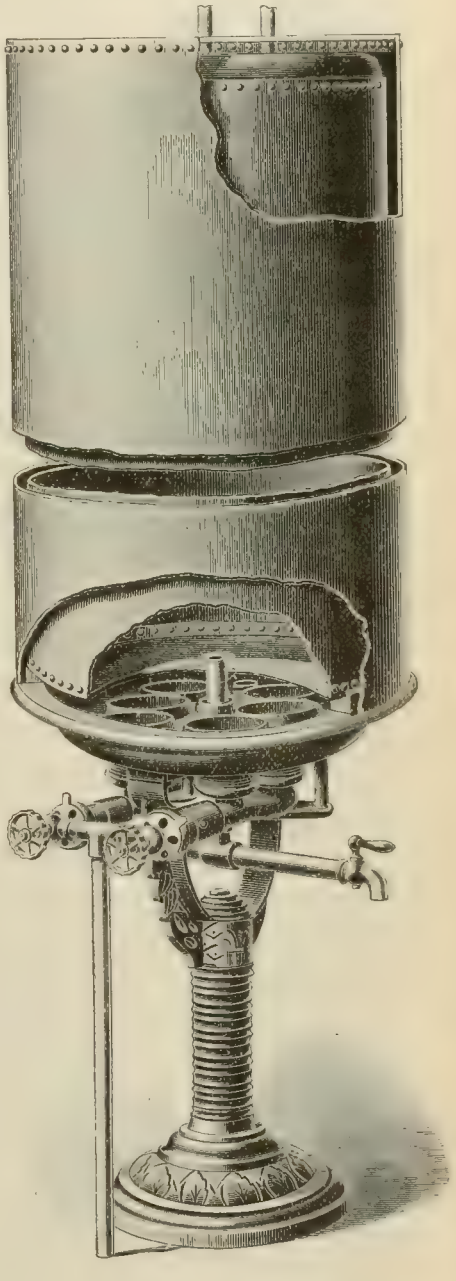
THE NEW JERSEY LAMP & BRONZE WORKS, New Brunswick, N. J., have ready for distribution to the plumbing trade a new catalogue of gas fixtures which is a fine example of artistic printing.

TWO YEARS AGO last May a new manufacturing enterprise was started at Buchanan, Va., known as the Smith & Briggs Brass Works. This was an amalgamation of two former Brooklyn, N. Y., interests, transplanted to Virginia on account of inducements offered by communities and land companies. The company now have in operation a foundry, 80 x 30 feet in dimensions; brick building for engine, 40 x 40 feet; a polishing room, 40 x 40 feet, together with a finishing department, 100 x 30 feet. There is also a pattern shop, 50 x 25 feet, constructed of iron, besides a core room, blacksmith's shop, coal sheds and pump house. They manufacture principally bathroom and lavatory fittings, Handy wash tray and waste traps, stop cocks and plumbers' brass work generally, as well as specialties from composition, phospho-bronze and aluminum. This plant is located on the Norfolk & Western and Chesapeake & Ohio railroads, and the Baltimore & Ohio Railroad will soon be in there. Coal is cheap and labor is advantageously secured. The force at present numbers upward of 40 hands. The New York office is at 275 Pearl street, where a stock is carried. The president of the company is Benjamin C. Smith, who also does a general plumbers' supply business at the above address, independent of this interest at Buchanan. The works are in charge of William Briggs as manager.

JOHN T. MCMAHON, a Harlem plumber, has been appointed deputy-warden of the Tombs, New York City.

Gas Heated Kitchen Boiler.

The Gilbert & Barker Mfg. Company, New York office 90 John street, are offering a device as here shown for heating water. This is designed for use where the ordinary range with water back is not available, or where, during the warm months, it is not desirable to operate a range; also, if for any reason the range when in use is not equal to the requirements this may be used exclusively or in connection with the range. It will be readily seen that the most economical way to heat water is to maintain a fire under it.



Gas-Heated Range Boiler.

This is not only accomplished, but the boiler is kept surrounded by a bath of hot air that has already been utilized below, by means of a sheet-iron jacket placed around the boiler. The boiler support is a cast iron bed plate with six round holes about 3 inches in diameter, conforming to the shape of the burners, thus insuring a constant and uniform supply of outside air to assist combustion, in addition to the customary air mixers attached to both gangs of burners. Each set of three burners is controlled by a valve, so that one or both may be used. The heat can be kept at a minimum or maximum, started or discontinued in a moment. The company are not only installing this apparatus in connection with new work, but are applying it to ordinary house boilers already in use. One feature referred to is that in case of drip from any cause whatever, it would be caught in the cast-iron stand and evaporated at once. The immunity from handling of wood, coal and ashes is likewise dwelt on by the makers

THE ST. JOSEPH PUMP COMPANY, St. Joseph, Mo., are making an addition to their already extensive plant. The addition referred to will be a two-story brick building, 35 x 90 feet. This addition has been necessitated by the fact that the company have outgrown their present capacity, and the new building will be entirely utilized as soon as it is finished. E. A. King, secretary and general manager, has been with the company from the start, and much of the success attained by them is due to his efforts.

THE BOSTON PLUMBERS adopted this week resolutions thanking the members of both branches of the Massachusetts Legislature who supported the bill relating to sanitary plumbing and providing for the registration of plumbers.

Worthy of Imitation.

About a dozen of the young men employed in the machine shops of M. C. Hammett at Troy, N. Y., decided about two years ago that a knowledge of drafting and geometry would be of benefit to them in their business. They laid the matter before their superintendent, W. S. Rogers, and found that he was heartily in sympathy with their movement and at their request agreed to give one evening of his time every week in giving them lessons, but their employer, also desirious that they should have every facility for furthering their plans, offered the free use of office and drawing room, light and materials. The result is that one of them to-day holds the position of superintendent for a new and growing firm, another is foreman in a large machine works in a Southern city, a third is an inspector in a large electrical manufacturing company in Massachusetts, one of them has been raised to a position of trust by his employer, another, having finished his term of apprenticeship, is fitting himself for a course in the Rensselaer Polytechnic Institute at Troy, while the youngest, after serving another year in the shop, will also take an institute course. These six young men had two years ago only ordinary prospects of employment. Their efforts have proved their benefactors. The remnant of the class gathered at Mr. Rogers' house a few evenings since to take their final lesson and recieve their diplomas. The young men presented their superintendent with a handsome silver smoking set.

Prize Competitions

$25.00.

As announced in previous issues the following competition is now before our readers and remains open until the date named:

Prize Competition No. 27.

SUBJECT:

Local Associations of Merchants.

It has been found feasible to form associations in many places for the purpose of securing more friendly relations among competitors and reaching an understanding in regard to matters of common interest. Among the good results referred to as coming from such associations are the following: Overcoming petty jealousies; cultivating a spirit of fraternity; listing of undesirable customers; an understanding in regard to time of presenting bills; putting in operation early-closing movements; agreement as to the prices at which goods are to be sold; mutual accommodation in supplying goods which one merchant may be temporarily short of, &c. The subject is thus evidently a broad one and of a good deal of practical interest. In discussing it the following points are suggested:

Whether it is desirable to have such associations;

How such associations may be organized;

The objects to be accomplished by them.

It will also be of interest to have any information in regard to the practical working of such associations.

This competition will remain open until July 8, 1893.

The following prizes will be awarded in each competition:

First prize.....	$12.50
Second prize.....	7.50
Third prize.....	5.00

The prizes will be awarded for answers which, in the judgment of the Committee of Award, are most suitable for publication and of the most general interest

We reserve the privilege of extending the time on any competition in case the contributions received are not of sufficient number or merit for the committee to award prizes. These competitions are open to every one, and it is hoped that there will be a general response from business men. We shall have the privilege of publishing any or all of the contributions received.

Replies are to be received not later than the dates on which the competitions close. They should be addressed as follows:

DAVID WILLIAMS,
96–102 *Reade street,*
New York.

Building Ordinances of Berlin.

The European correspondent of a Baltimore journal, writing from Berlin, gives some particulars relating to the building regulations of that city which show that a military discipline, characteristically German, exists in the municipal government of the metropolis of the Fatherland. He expresses himself as follows: "Berlin is the best managed city in the world, and its city fathers regulate the style of the buildings which shall be put up. You can't build a dog kennel without showing a design of it at the City Hall, and no man can put up a sign-board on his own house until he has shown a diagram of it and has gotten the permission of the government. You can't put down a pavement in front of your house without a permit; and the government watches your building and insists that you make your walls just so thick, while the ceilings must be of a given hight and the fronts must be of a uniform pattern. In building the house you are not allowed to litter the street with your brick and mortar, and all the materials must be kept inside the lot. You have to fence off the street while the building is going on, and when your house has reached the hight of the second story you must build a roof over the sidewalk to prevent the bricks or mortar falling on those passing below. The building is done much better than with us, and much more economically. Nearly all the mortar is mixed at one place, there being a mortar company which sells the material ready mixed to the builders and carries it about in iron wagons and delivers it just where it is needed. This Berlin establishment is paying dividends of 25 per cent. on its capital, and it sells mortar, like coal, at so much per wagon load or per ton." In regard to the latter subject, the writer was evidently unaware that a similar system of mortar supply was already in operation in this country, having been introduced in the city of Philadelphia last year with the best results.

The latest project in ship canals is one to connect the city of Brussels with the sea. The Belgian Government has decided to contribute a round sum toward the work. It is also willing to take over shares of the company to the extent of $1,200,000 and to guarantee the obligations of the concern.

In 1892 there were granted a total of 3417 Canadian patents, of which 2227 were taken by American citizens, 671 by Canadians, 298 by Englishmen, 106 by Germans, 26 by Frenchmen and 89 by persons of other nationalities. It will thus be seen that nearly two-thirds of all the patents granted in Canada are to American inventors, and but for them the Canadian Patent Office would make a very poor showing. The entire receipts of the Canadian Patent Office were $84,720, and the expenditure was $39,643, leaving a profit of $45,000 over expenses. It may be said that American inventors chiefly support the Canadian Patent Office as well as the Patent Bureau at Washington.

The New York Academy of Medicine's special committee on quarantine precautions has drafted a bill for the establishment of a national quarantine, which would have supreme control of the quarantine in all ports, thus removing this important matter from the influence of local politics. The committee is anxious to have this measure presented to Congress with the indorsement of the entire medical faculty of the country.

The German Society of Engineers has issued a circular soliciting subscriptions for a proposed memorial to the late Werner von Siemens.

TIN PLATES.

Tin Plate Production to March 31.

Colonel Ayer's report on the production of domestic tin and terne plates during the first quarter of 1893 not being yet forthcoming from the Treasury Department, a Pittsburgh journal—*Tin and Terne*—has compiled an interesting summary, based on reports obtained from 24 firms engaged in the manufacture, which indicates that the increase in production of domestic tin plates during the months of January, February and March approximates 36 per cent. more than that of the last quarter for which we have the official returns—namely, that ending December 31 last, notwithstanding that manufacture had been more irregular at some of the works. The figures given by these concerns, which include two-thirds of the whole number of tin-plate works now in operation, are tabulated as follows:

	Lighter than 63 lbs. per 100 sq. feet.	Heavier than 63 lbs. per 100 sq. feet.
	Pounds.	Pounds.
Tin plates	12,929,129¾	417,703
Terne plates	10,502,556½	.....
Total	23,431,686¼	417,703
Made from American black sheets	8,950,826	
Made from imported black sheets	12,310,165	
Total	21,260,991	

When it is understood that the 12 or 13 producing concerns from whom no reports were collected include in their number some of the largest in the country, the assumption that at least 32,000,000 pounds will represent the total production of tin and terne plates for the quarter appears to be a conservative conclusion.

The Tin-Plate Exhibit.

In the Mines Building at the World's Fair, on the second floor at the south end, is found the display made by the American tin and terne plate manufacturers. Here all of the materials that enter into the production of tin plate are shown. There is the fuel used (no natural gas, of course), both coke and coal, with the pig iron, which becomes a billet, and next a tin-plate bar, then rolled into sheets of less and less thickness until the lightest black plate is shown, cleaned, ready for the plating of either lead for ternes or tin for bright sheets. A big glass bottle shows the palm oil, and a pile of brown dirt shows the tin as it comes from some mines, and a lot of stones or quartz rock shows the ore of other mines. Then the smelter is shown, with pigs of tin from the Temescal mines in California and Harney Peak mines in South Dakota. Lead ore and pigs of lead are also exhibited. Grouped around this display are boxes of both bright and leaded plates from the many tin-plate plants in this country, and that the piles of boxes are no higher is due to the demand for every sheet made.

The skill of the American tinner has been called in use to make the display complete by inclosing the space with an ornamental railing and balusters made of tin, and three pavilions, to show the elaborate effects possible with tin in columns, cornices, ceilings, walls and roofs. On a tin pedestal at one side is a glass case containing a full-rigged schooner made entirely of tin, and on the other side on a similar pedestal rests a column at the top of which is a globe with an eagle perched upon it holding a banner in its beak, the ends of which are attached to its outstretched wings, all made of American tin plate. This exhibit is in the charge of a gentleman connected with one of the large tin-plate plants, and who answers the many odd questions asked by the always inquisitive sightseers.

The following is a list of the makers who have contributed to make up the exhibit: American Tin Plate Company, Elwood, Ind.; Irondale Iron & Tin Plate Company, Irondale, Ohio; St. Louis Stamping Company, St. Louis, Mo.; U. S. Iron & Tin Plate Company, Demmler, Pa.; Columbia Tin Plate Company, Piqua, Ohio; Cincinnati Corrugating Company, Cincinnati, Ohio; Cleveland Tin Plate Company, Cleveland, Ohio; Marshall Bros., Philadelphia, Pa.; Phillips Bros., Philadelphia, Pa.; E. Morewood & Co., Elizabethport, N. J., and Gas City, Ind.

SCRAP.

A LOCAL PAPER of Pennsylvania origin makes the astounding statement, on the authority of a prominent manufacturer, that "this country consumes about 400,000 tons of tin plate daily." This is equivalent to nearly 3000 millions of boxes a year. If the reporter had written *yearly* instead of daily in the sentence he would probably have quoted his authority correctly.

THE STRIKE at the Carmarthen Tin Plate Works, Wales, has been raised by mutual concessions on the part of employers and employed.

THE BRITISH tin-plate market is reported as unchanged in its dullness. Advices from London, under date of June 17, are to the following effect: There is very little life in things here, and the outlook for the next few months does not look hopeful. There is not much business offering, and what there is is eagerly sought after by sellers, and prices are again a shade weaker, some good orders for cross specifications having been placed at lower prices than had ever been accepted before.

THE ALIQUIPPA TIN PLATE COMPANY'S plant at Aliquippa, Pa., has been shut down temporarily, but will be started again about the middle of July.

LYON, CONKLIN & Co. of Baltimore, report a large demand for their roofing plates, particularly for their brands known as Lyon Hand Coated and L. C. & Co.'s Redipped, and for their single-coated roofing plate known as the Glendale brand. This is very satisfactory to the firm and speaks well for their goods.

AN ENGLISH TRADE JOURNAL, in writing recently about the American tin-plate industry, remarked that the fact had long been patent "that, in the way of manufacturing tin plates America is capable of doing practically nothing, at present at any rate." Our contemporary's information must be somewhat incomplete; or perhaps its statistics were taken from the source from which so many English papers have of late drawn their material for articles on the tin-plate manufacture of America—namely, the report of the British Secretary of Legation at Washington, which was published a couple of months ago. The figures there given are those for the half year ending June 30, 1892. Twelve months of vigorous development since that date have put a different complexion on the matter.

A Prehistoric Blast Furnace.

Prof. Flinders Petrie, the distinguished explorer of biblical lands, when excavating and investigating in Southern Palestine a few years ago convinced himself that in a remarkable mound called Tel-El-Hesy would be found the remains of what was one of the strongest places in that country down to the invasions of Sennacherib and Nebuchadnezzar. The explorations since carried out on the spot were announced at a recent meeting of the Palestine Exploration Fund in London as having fully verified this forecast. The mound is found to be composed of no fewer than eight successive towns formed on the ruins of one another, the uppermost dating about 500 B.C. and the lowest, or earliest going back to 1500 B.C., the time of the great Egyptian conquests in Palestine. Amid all the evidence discovered by F. J. Bliss of the American College at Beirut, Syria, who has had charge of the excavations, of the civilization of that remote age—wine presses, treacle presses, alkali burnings and innumerable other things—by far the most curious is the disclosure of an iron blast furnace, so arranged as to give strong evidence of being intended to heat in its descent a blast of outside air forced through passages before entering the chamber at the level where tuyeres are usually found. "If my theory be correct," says Mr. Bliss, "we find 1400 years before Christ the use of the hot-air blast instead of cold air, which is called a modern improvement in iron manufacture due to Neilson, and patented in 1828."

The following changes in the rates of import duty levied on the undermentioned articles have been introduced by the Newfoundland Government: Iron and steel buildings (not including their wood work) iron and steel beams, girders, joists, pillars, columns, doors, sashes, shutters, cornices, architraves, channels, gutters, angles, structural shapes, shingles of iron, steel or composition; sewing machines, knitting machines, and parts of same, are now all assessed at 10 per cent. ad valorem.

ROOFING AND CORNICE.

Laying Steel Roofing.—III.*

BY L. S. BONBRAKE.

FIRE WALL AND CHIMNEY FLASHING.

Perfect fire wall and chimney flashing is important in the construction of a metal roof, and is secured only by counterflashing or the use of a strong, durable cement, as Portland or rock plaster. In the cutting of roof strips for flashing a chimney, care should be taken to have measurements correct, and cut to the line. A beveled wood strip is advised in the chimney valley, shown at A, Fig. 12, to give pitch and run the water in either direction, as desired. The sheets are usually cut as shown in Fig. 13 on straight lines and bent at dotted lines. When the chimney is smooth an edge can be turned on the perpendicular edge of flash and corners seamed on, forming a solid box around chimney, except at the bottom corners, which can be soldered or cemented. Counterflashing, as is readily understood, is, 1, a flash made from roof strips, extending up the chimney to hight desired; 2, a strip of metal extending from between two rows of brick in chimney, down and over the upturned edge of first flash, as in Fig. 14.

Where Portland or rock plaster is used it is unnecessary to use the second strip, but instead, a piece of felt or sized paper can be placed over the upturned flange or flash, and plastered over with the cement mentioned up the chimney a short distance and tapered to a feather edge at the top. This forms a pocket, and a thorough time test has proven it to be a durable and effective manner of flashing—neat in appearance. It fully provides against damage or leak in case the roof should settle around the chimney, as the felt B, Fig. 12, prevents the cement from adhering to the metallic flash and allows it to sink without disturbing the cement.

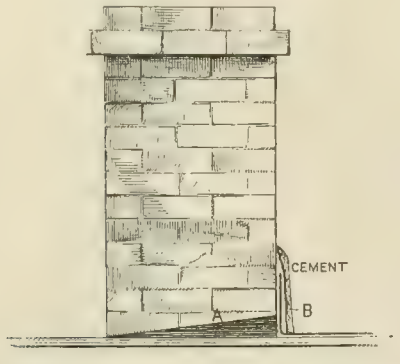


Fig. 12.—Laying Sheet in Chimney Valley.

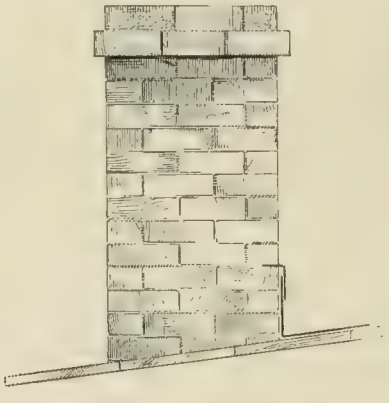


Fig. 14.—Counterflashing.

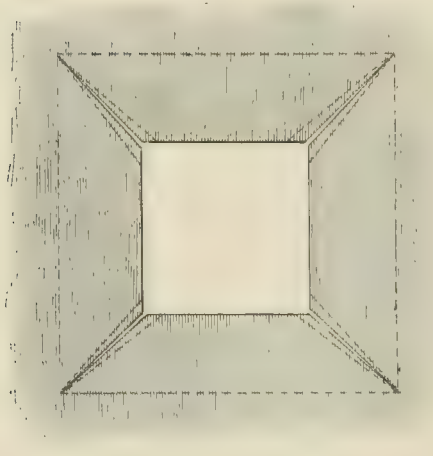


Fig. 13.—Sheets About Chimney.

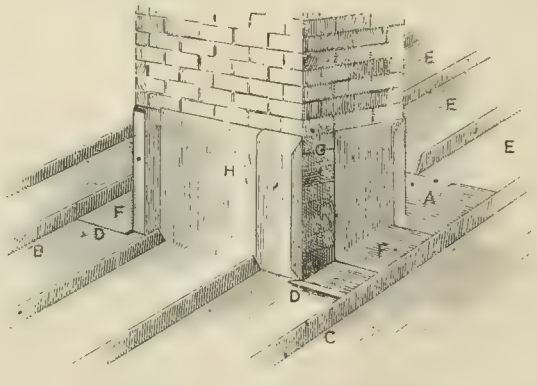


Fig. 15.—Flashing Large Chimney.

LAYING STEEL ROOFING.

When the chimney to be flashed is of such size as to require more than two sheets to pass or more than one standing seam to abut it, a valley should be laid at the upper side of the chimney, as at A, Fig. 15. For convenience the valley is usually made from steel used in roofing and laid lengthwise of the sheet. It may extend up against the back of the chimney from 4 to 6 inches, in proportion to the pitch of the roof, with the remainder of the sheet laid up the roof. A fold is turned on the upper edge of the valley sheet, and the roof strips E E E are secured to it, as shown.

The roof below the chimney is continued on from the last standing seam laid, B, on reaching the chimney until a point on the roof past the chimney has been reached, where the

* Copyrighted, 1893, by L. S. Bonbrake.

standing seam C is formed. This is done regardless of the chimney, except to turn up the flashing H and to form the folds B B to receive the folds of the side strips F F.

The strips F F are made of such width as to form the flashing for the sides of the chimney to cover the space between the standing seam and the chimney and to form the respective sides of the standing seams. They should be of such length as to allow the valley A to be seamed on at the top and extend down the roof along the side of the chimney and be hooked to the bottom roof sheets at D D. A section of the strip cut out at G, Fig. 15, exposes edges turned at D.

In Fig. 16 a view is given of the side strip, with edges turned at its top ready to receive and be attached to the valley. Fig. 17 is a perspective view of the valley sheet, with the flash H turned for the back of the chimney. The upper fold is formed to engage the roof proper and with edges turned on the right, by which it is secured on to the side strip, Fig. 16. Fig. 18 shows the valley (Fig. 17) and side (Fig. 16) connected, making the upper right-hand corner with the seams formed and ready to close. The counterflash may be made as described elsewhere.

Fig. 19 shows the manner in which a collar is seamed into the body of the roof where tile chimneys or circular stacks pass through and are to be flashed. A separate sheet is used for this purpose and the work is usually performed at the factory or shop. A band is formed of the hight wanted and fitted around the part to be flashed. An outward-turned hem is formed upon the cylinder and a hole is cut, with a flange formed in the roof sheet to fit over the cylinder and engage the hem, when it can be pinned down and double seamed, as shown. It can then be taken to the roof and edges formed to seam in and become a part of the roof. When it is not convenient to slip the collar over the cylinder to be flashed it must be made in two sections, or cut at dotted line, A A, allowing each half to be enough larger than a half circle as will provide for secure laps at each side.

When space between the stack and the collar is desired, for ventilation or other purposes, it is then necessary to counterflash over the cylinder, which may be done by forming a cone-shaped hood, Fig. 20, to fit the stack end and extend out and over the rim of the cylinder to such a distance as will provide against rain or snow blowing in through the open space. The hood can be held secure in place by means of an iron band, Fig. 21, which may encircle the flange A formed on the hood.

(*To be continued*).

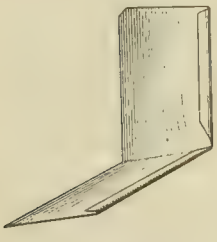


Fig. 16.—*View of Side Strip.*

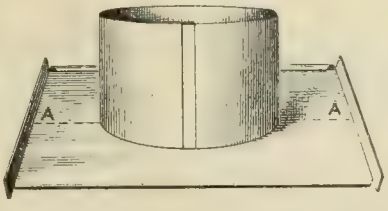


Fig. 19.—*Collar for Tile Chimney.*

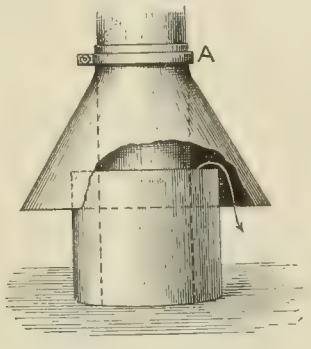


Fig. 20.—*Counterflashing Hood.*

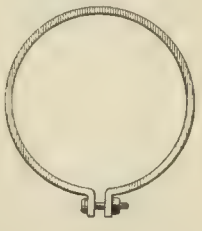


Fig. 21.—*Band for Holding Hood.*

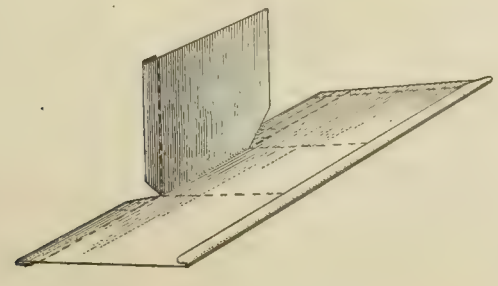


Fig. 17.—*View of Valley Sheet.*

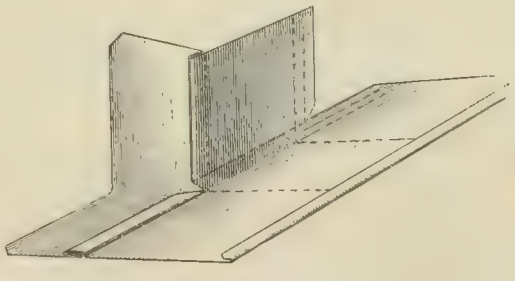


Fig. 18.—*Valley and Side Connected.*

LAYING STEEL ROOFING.

Tinners and Roofers' Exhibits.

In the Manufactures and Liberal Arts Building at the World's Fair are a number of exhibits of interest to the tinner and the roofer.

CORTRIGHT METAL ROOFING COMPANY,

Philadelphia and Chicago, have a pretty pavilion roofed with tiles or shingles, with cresting and finials of same material. The lower part of the sides of the building is weather-boarded and the upper part covered with metal shingles, both parts painted different colors. A small portico runs across the front and the exhibit is very attractive, particularly as inside it presents a line of metal shingles as samples, and offers some easy chairs where one can rest and receive all of the information he wants from M. B. Ulleiy, who is in charge and who is a tinner of 40 years' experience.

BRYANT & WATSON,

Crawfordsville, Ind., exhibit the crestile conductor, a combined cresting, ridgeboard and electric conductor, to which finials, weather vanes or ornamental scrolls may be attached. It is to take the place of the ordinary saddle board on a roof, and being made of galvanized steel, is easily applied and durable, in addition to being more orna mental than the board in general use.

THE CANTON STEEL ROOFING COMPANY,

Canton, Ohio, show what they make that is of interest to the progressive tinner, in a pavilion made of sheet metal goods from their own plant. As a matter of course it is roofed with their specialty, the H. W. Smith patent steel roof, and painted with their anti-rust paint. The ceiling is also of sheet metal worked into an ornamental design. The upper part rests on ornamental columns and completes a very pretty structure. At the front one show board displays samples of their patent double cross lock seam roofing in plain, tinned, galvanized and painted iron, and another samples of metal shingles and stamped and corrugated iron for roofs, siding and ceiling. Inside at each end is a large ornamental ventilator, and at the back is arranged tin, copper and galvanized hanging gutter and corrugated conductor with elbows, cut-offs and hangers. Elegance is contributed to the display in the designs and the arrangement of copper and galvanized finials, crestings and cornices.

Samples of Ceylon graphite are shown from which their paint is made. Their guarantee for this paint is against cracking, peeling or absorbing moisture, and its resistance to the action of heat and acids, making it superior for smoke stacks, roofs and either wood or brick work.

FIRE AND WATER PROOF CEMENT ROOFING COMPANY,

Chicago, show a little house roofed with their cement, and samples in different colors to show the effects that may be produced. It is made of one half German Portland cement and lighter material, so that it is claimed to be 15 per cent. lighter than gravel. It can be used on steep as well as flat roofs. John G. Zallee, the patentee, can be found in the little house to give full particulars.

THE ADAMS & WESTLAKE COMPANY,

Chicago, show several tiers of large tin cans, some red, some white, some blue and some with stars, forming the flag which waves over the fair, and on the reverse side, on a blue ground, small bright tin cans form the name of the company. This flag must be 25 feet high and of appropriate length, and naturally attracts attention from quite a distance. Around it are grouped their specialties in oil cans, wire sieves, Imperial sifters and a selection of household tin goods.

KEEN & HAGERTY,

Baltimore, Md., have erected a hard wood platform and several tiers of shelves, on which they display a great variety of handsome household tinware, pieced and stamped, plain and japanned, and some handsomely decorated. This display is well calculated to fascinate the eye, and it is impossible to say what its feature is unless it be beauty, as every article is a specialty. However, a soldering copper made for a rubber hose attachment, so that it can be continually heated by gas, is surely interesting to the tinner.

IRON CLAD MFG. COMPANY,

New York, make their space look twice its size by the use of plate-glass mirrors. The space is inclosed with a nickeled railing and a skeleton pavilion is formed by using patent seamless circulating boilers for columns with small milk cans for a top ornament. From the columns nickeled bars are run to a central nickeled shaft to form the roof. From the top of the central shaft wires are run to the corners, and hung from them are letters forming the company's name. To the sides and roof thus formed are attached every article required in the household of Iron Clad enameled ware. Over 1200 little cocoa bowls in various colors are hung about, with novel and attractive effect. Their many specialties in milk cans, ash cans, ice cream cans, coal hods and soda fountains, though incongruous in use, are arranged in perfect harmony. Their new retinned stamped steel ware and the number of specialties modestly exhibited will keep many a buyer busy in assorting an order.

THE JACOB J. VOLLRATH MFG. COMPANY,

Sheboygan, Wis., lay a Brussels carpet on the floor and inclose three sides of their space with glass cases having white frames and gilt decorations, a roof with a gilt decorated ceiling arches across and supports pyramids of pans in the center and at each corner with coffee pots and tea pots along the sides. The exhibit is made up of their world's standard white enameled ware, which embraces all the known articles of use to the modern housewife. A very pretty effect is gained by a vine covered with colored leaves twining all through the exhibit. At one side, against a garnet background, the line of larger and heavier goods is shown, while on the floor are shown enameled sinks and stove reservoirs.

WAGNER MFG. COMPANY,

Sidney, Ohio, make a fine display of cast-iron hollow ware, griddles and waffle irons, ground, polished and nickel plated. A ball and socket joint is a feature of the waffle iron, so that it can be turned on a gas or gasoline stove without lifting it off and in a small space.

OHMER'S FLOUR BIN COMPANY,

Dayton, Ohio, show a novel arrangement for storing a supply of flour in a convenient place, or directly over the pastry table, which also sifts the flour and measures the quantity used. It is tastily decorated and sold at prices that seem attractive.

KINGSLEY & DAVIS,

Barrington Centre, R. I., show a nutmeg grater which, they claim, uses up the smallest pieces of the spice without the least difficulty.

C. S. OSBORNE & CO,

Newark, N. J., in addition to a fine display of leather-working tools, show their well-known gasfitters' pliers, wire-cutting nippers, screw drivers and washer cutters.

RONALDS & CO.,

Brooklyn and New York, in addition to their regular line of galvanized and copper-circulating boilers, show a novelty in various colored agate boilers marked "enameled inside and outside. Cylinders seamless. Test, 450 pounds."

D. R. SPERRY & CO.,

Batavia, Ill., make a novel exhibit by forming a pavilion of their heavy hollow-ware. The columns are formed of druggists' mortars connected at the top by cast braces supporting a series of globes formed by placing one cauldron upside down on another and these in turn support four pyramids of sugar kettles which gradually diminish in size, supporting as a top piece a mammoth globe made of cauldrons, the upper half being gilded and the lower half decorated with their trade-mark, which is Macbeth's witches around the boiling cauldron. White letters with red shading are used to enumerate the different kinds of kettles and cauldrons made by them.

SMITH & ANTHONY STOVE COMPANY,

Boston, Mass., show cauldrons from 20 up to 125 gallons, painted white with gilt letters and substantial black legs. They are furnished with copper hinged covers and openings for pipe connections when steam is to be the heating or cooking agency.

GRISWOLD MFG. COMPANY,

Erie, Pa., have three sides of their space inclosed with show cases having black frames decorated in gilt, while above them on a black background "Griswold's Erie Ware" is formed by miniature polished spiders. The front is barred by a chain of miniature nickel-plated tea kettles. The cases are filled with spiders, griddles, broilers, waffle irons, Scotch bowls, pots and tea kettles, some plain, some polished and some nickle plated. The American dampers are shown in various sizes, and though 2,000,000 were sold last year, the demand to date this year is a "tip" on its popularity and the future possibilities after it has been seen at the fair. In the center of the exhibit are waffle irons, which present every desirable feature for use, and can be turned on any stove without removing, or be removed without the parts shifting. They are made to cook several small individual waffles or as a large iron to furnish the usual four triangular temptations. Prices of the miniature goods displayed are printed, with an invitation to send for a Columbian souvenir, the card having holes for the coin and a flap to paste over it.

FLASHINGS.

THE LONG STEEL & IRON ROOFING COMPANY, Indianapolis, Ind., publish an illustrated and descriptive catalogue of the various goods of their manufacture, including roofs, sidings and ceilings of many kinds. The circular opens with notices of corrugated sheets, tables of prices and sizes, and diagrams showing the application of the material. Then comes steel roofing, crimped roofing, beaded siding and ceiling, sheet metal weather boarding, sheet steel, pressed brick, &c.

THE STEEL CEILINGS of the porches and assembly rooms of the Mines Building at the fair were made by the Caldwell & Peterson Mfg. Company of Wheeling, W. Va., as is announced on a gilt sign on the West Virginia State Building.

AMONG the recent work completed by J. Foerster & Son, 806 East Fifth street, New York, are the following: Galvanized iron cornice on two buildings in East Tenth street near Avenue B; similar work with window trimmings on buildings in East Third street; ornamental cornice balustrade and pediment on building in West Ninety-seventh street; cornice on store fronts on East Twenty first street; ornamental cornice, roofing and skylight for dwelling on East Fifty-seventh street. The firm have also put up the copper cable lightning rod on St. Patrick's Church at Elizabethport, N. J. Among the miscellaneous work that they are doing are the sheet-metal letters for attaching to wood and wire mesh, to be placed on the steamer "Aurora." The letters are 18 inches in hight and are raised 1½ inches.

Sealed proposals will be received at the office of the Supervising Architect, at Washington, D C., for the iron stairs and interior iron and copper work for the U. S Post Office, Court House, &c., at Troy, N. Y., in accordance with the drawings and specifications, copies of which maybe had from the Supervising Architect at Washington or at the office of the superintendent at Troy.

The Columbian Liberty Bell, which is to figure at the World's Fair, was successfully cast at the Meneely Bell Foundry, Troy, N. Y., on Thursday, June 22. A large number of historical relics were incorporated in the metal used for the casting. It was intended that the metal should be released from the furnace by Mrs. Cleveland by means of an electrical apparatus operated from Gray Gables, but the heavy storm prevailing at the time frustrated the arrangement.

World's Fair Exhibits.

The Jacob J. Vollrath Mfg. Company

of Sheboygan, Wis., make a fine exhibit of their Vollrath enameled ware. The company have recently engaged in the manufacture of steel and sheet iron enameled ware, but their exhibits are of as high an order of excellence as though they had been making this class of goods for years. They have built a very neat pavilion for their display, the sides of which are glass cases filled with specimens of all kinds of cooking utensils as well as covered vessels, teapots, coffee pots, &c. Many of the specimens are handsomely decorated. Different colors are shown. On the roof of the pavilion they have a variety of specimens of their blue and white and Imperial cast ware, in the manufacture of which the company built up their reputation in the trade. They also manufacture maslin kettles and pots, enameled on the inside and painted on the outside.

Belding Mfg. Company

of Belding, Mich., have done very well with the limited space they were allotted. They show all the regular styles of household refrigerators except sideboards. All sizes are in the display, from very small boxes for small families up to the largest made for large hotels and restaurants. Thirty-two of their grocery refrigerators are in use on the fair grounds in restaurants. The sample of this class shown in the exhibit is finished with plate-glass mirrors in each panel, making a very pretty finish and attracting much attention. The other goods shown are just as they come from the factory, but are so well finished that they make a fine display. In one style of their domestic refrigerators a sliding glass shelf is constructed to hold meat or butter. The object of this is to enable the shelf to be pulled out so that a piece of the contents can be cut off without permitting the interior of the refrigerator to be heated up during the process. When the shelf is pulled out, the closed back completely stops up the opening. The hardware on these refrigerators is elegantly nickel plated.

Detroit Corkscrew Company

of Detroit, Mich., exhibit a variety of corkscrews. The Columbus power corkscrew is of the type with a base to fit on the mouth of the bottle, when the cork is drawn up through the center. Greeley's cork extractor is a grooved flat wire with the end bent over to make a short catch. It is forced down the side of the cork, then twisted round to pull the cork out. The Puddefoot power corkscrew is a pocket corkscrew with a short fulcrum riveted at the joint. After the screw has been driven into the cork, the fulcrum is dropped on the top of the bottle and the cork is then easily drawn by leverage. The Davis pocket knife, wire cutter and lever corkscrew has a serviceable knife blade, and the wire cutter is also intended for use as a fulcrum to rest on the top of the bottle, making the cork easy to pull. The Davis corkscrew is the same without the knife blade.

C. E. Jennings & Co.,

79 Reade street, New York, exhibit in an upright glass case samples of their mechanics' tools. They are very attractively arranged in groups according to size, tacked on the back of the showcase. A small circular saw forms the center piece. It is inclosed in a frame of reamers and other bits, extending points outward. Gouges, draw shaves, ice shaves, chisels, screw drivers, plane bits, scratch awls, extension bits and back saws make another series in the enlargement of this circle, while on the extreme ends are butchers' cleavers and saws, hand saws, straight and bevel sided chisels, gouges, &c. The bottom of the case and a shelf above it are devoted mainly to a display of augers and auger bits. This is a special feature of the exhibit, the bits being of all styles of twist, and a great variety of sizes. In some of them the twist has been extended far beyond the usual length, to show the facility with which the firm can turn out this class of fine work. Sets of bits are displayed in cases. There are also cases of chisels, containing assorted sizes. Taken collectively this exhibit is particularly creditable and noteworthy.

Vienna Enamel & Stamping Company

of Porter, Ind., whose main office is at 149 Lake street, Chicago, have adopted an original method of attracting attention to their display. Having a corner space they have carpeted the corner and left it uninclosed, running an upright showcase along the rear sides. On shelves in the case they exhibit their enameled ware in marbled, mottled, deep blue and white finish, introducing variations from these types to show the capabilities of their process. The goods shown cover table ware, decorated drinking cups, tea and coffee pots, toilet sets and cooking utensils. The lower part of the showcase is decorated with metal panels of beautiful designs, handsomely enameled.

Universal Sad Iron Company

of Milwaukee, Wis., have a large oak showcase, with glass sides, in which they show a large number of their sad irons arranged in pyramidal form. These sad irons are self-heating, being really charcoal stoves. They are made in several sizes, for family use or for dressmakers or tailors.

Stone Mfg. Company

of Columbus, Ohio, exhibit the Stone clothes wringer. They have erected for this purpose a series of shelves in pyramidal form, made of small channel iron, supported by a frame work of bar iron and angles. The channels for the shelves are placed just far enough apart to receive the feet of the wringers. The structure is thus light in appearance and very tasteful. These wringers are made with all-metal frames, galvanized. Interspersed among them are a number of toy wringers, exact reproductions in miniature of the commercial sizes. T. W. Stone, inventor of this wringer, is in charge of the exhibit. He has just brought out a new wringer named the Progress, one of which is on exhibition. This wringer is exceedingly simple, having no bolts, screws, threads or nuts. It adjusts for any thickness by means of a horseshoe spring, the ends of which are connected with the rolls. The metal table in the front of the rolls is pivoted on the inside clamp, so that when it is raised the rolls are released and the wringer can be moved from the tub. This is an entirely new feature in a wringer, the patent having been granted without any reference to any previous patent. It will be regularly manufactured by this company.

Hurd Refrigerator Company

of Duluth, Minn., make an unusually fine display of their refrigerators. They have finished them in carefully selected woods, which have been given a piano polish, while the interiors are lined with sheet copper tinned, instead of the usual galvanized iron. A fine sideboard in curled maple, natural finish, attracts particular attention. It has a high double closet with plate-glass doors, under which is a plate-glass mirror the full width of the refrigerator. The hardware is of solid bronze in a very pretty pattern. A tank for drinking water occupies the space in the center between the two compartments of the refrigerator. Another very pretty sideboard shown is in red oak. There are also grocers' refrigerators, various styles of domestic refrigerators and narrow apartment house refrigerators.

J. S. Thompson

of Erie, Pa., exhibits two of his North Pole refrigerators. The Crystal pattern of this refrigerator is lined with glass, making a very clean receptacle for the storage of food, and also free from any odor connected with a wood lining.

Alaska Refrigerator Company

of Muskegon, Mich., have a two-story pavilion, built of oak. This is an extremely handsome piece of work and attracts much attention. The posts are beautifully carved, with carved capitals. The roof of the second story is in oak panels, while the ceiling of the first floor is mirrored in panels. A neat stairway gives access to the second story. Here is the desk of J. Chapin, in charge of the exhibit. There are also on this floor a sideboard and some domestic refrigerators, one of which is kept in use to show its system of refrigeration. Below are a number of the company's goods taken from their regular line, finished just as they go to the trade. The display comprises sideboards, grocers' and florists' refrigerators, a beer cooler and a line of domestic goods, all built on the well-known Alaska system of refrigeration.

Wisconsin Refrigerator Company

of Eau Claire, Wis., have a very good display of their Peerless refrigerators. The gem of this collection is a full mahogany sideboard refrigerator, made to order for a customer. It is beautifully carved and paneled, has a large plate-glass mirror in the top and is supplied with compartments in addition to the food and ice compartments. This stands on an elevated platform, approached by a short flight of steps laid in parquetry. The other refrigerators shown are just as taken from stock. They are well made, however, and finely finished in every detail. The point specially made in the construction of these refrigerators is to secure easy access to all the flues so that they can be readily cleaned. The sides of the flues are lined with wood, on the theory that the moisture condensing on metallic surfaces would obstruct the free passage of air.

It is stated on French authority that the Panama Canal works will be resumed at the end of the current year, and that for this purpose $10,000,000 have already been raised. The gulls are not all dead yet.

The railway and tramway lines in Teheran, Persia, and its environs, lately owned by a Belgian company, have passed into the hands of the Russians, who are extending them considerably.

STEAM AND HOT WATER.

Hight of Horizontal Steam Mains.

From J. M , *Pennsylvania.*—As there is much diversity of opinion among steam fitters in my neighborhood as to the proper hight of horizontal main at the lowest point in a gravity return above the water line in the boiler, I wish you would state what it should be for runs of 100, 200 and 400 feet; also the quickest way of finding the length of pipe in running 45° L's without using a level.

Answer.—The above inquiries were submitted to M. W. Mackay, the well-known expert in steam and hot-water heating, who furnishes us the following answer:

Regarding the proper hight at which the lowest point of a horizontal steam main should be located above the water line in a steam heating apparatus at different distances from the boiler, would say that, in my opinion, distance does not make any material difference except in long runs, where the sizes of the mains are placed too small or in such a manner as to give friction. In such cases a greater hight would be an advantage, but the proper cure would be to place larger mains, and while I have a number of good working apparatus where the distance between the lowest point of the horizontal steam main and the water line is less than 1 foot, still I have made a practice of recommending that the horizontal main, at its lowest point, should be at least 2 feet above the water line of the boiler. This might necessitate pitting the boiler in some cases, but placing the boiler on the cellar bottom without a pit, with the horizontal steam piping nearer the water line, would possibly result in flooding the steam main and cause a failure or partial failure. If fitters would make a practice of carrying the steam main at its lowest point 2 feet above the water line, and use ample area in mains they would have no trouble on the score of flooding the steam main, regardless of how long the steam main may be.

Regarding the quickest method of figuring the length of pipe required, where 45° elbows are used, I have found that the simplest and easiest way for a fitter to get the length of the pipe that he requires is to describe a square, either full size or reduced to a scale, the size of the square being equal to the distance apart that the parallel lines are required to run. Taking his measurement diagonally across this square from corner to corner and deducting the space taken up by the elbows will give him the measurement of the pipe easier and quicker than in any other way. This rule is always practical and is readily understood by the fitters.

English Practice in Hot-Water Heating—XXIV.*

EXAMPLES OF BUILDING WORKS.—(*Continued*)

The next example that may be suggested is as Fig. 97. This is an apparatus extending away from the boiler in two different directions, for the purpose of heating two rooms of different size and in different manner. Taking the boiler first, this is shown having two flow pipes off the top, and each flow has a stop valve near the boiler, as shown.

When it is convenient to have two flow pipes in this manner. it is as well to use them, although one flow which is immediately branched in two directions has no bad features; in this latter case the single pipe should be a size larger. In an apparatus such as this, especially as it does not appear to be extending far in hight, the main or general services should be 1¼ inches; 1 inch might do in some cases, but is not recommended. The returns are usually brought right back to the boiler, although there would be no objection to their being branched into one if they met at some distance from the boiler (this is not the case in the example given). If the two services terminate in a single return, it would be well to have this of a size larger pipe, as suggested with a single flow. An emptying cock and cleaning plugs must be provided to the boiler, and when placing the boiler there must be room enough in front of it for the cleaning and stoking tools to be used.

Each flow pipe should have a stop valve in it, so as to regulate the heat in either direction as occasion may require, and also to check the possible inclination one service may have to work more freely than the other. Hitherto we have suggested giving the longest service a greater rise, if possible, so as to equalize results, and this may be done in this case if convenient, but stop cocks must be provided as well. We cannot suppose that both rooms want to be heated at the same time and to the same extent always, and on this account alone the stop cocks are needed.

The service shown as proceeding to the left goes to heat a large room, requiring three radiators—a billiard room, for instance. Speaking of billiard rooms, let the reader be cautioned against putting pipes or coils under the billiard table; nothing more improper could be done. If the pipes in question are sufficient to heat the room, they will pull the table to pieces. The writer was once consulted respecting a billiard room that some one had attempted to heat by a single radiator placed under the table. Fortunately for the table, the radiator was not a large one; it failed to heat the room and did no injury; but even with this insufficient heat the players complained of the heated air ascending from under the table and coming directly to the face when in the act of resting on the board to play. No heating appliances should be under a billiard table.

* Reprinted from the *London Builder.*

The illustration is intended to show the radiators placed around the room, in corners or at most convenient points. They must not, however, be too near wainscoting or similar wood work, or the heat will injure it. The radiators are shown of different shapes, but this is settled by the general conditions. The method of connecting them, however, requires a little explanation.

The nearest radiator is shown connected by a distinct branch flow and return from the main service ; this is the best way to treat this one. The next, in the left-hand corner, is connected to the flow only as shown and as described in Article XXII. The last radiator on the right has the main flow and return directly connected with it; it really forms a terminal to these pipes, as illustrated. Each of these radiators would need the usual air cock on the top. There would be no need for a stop valve to each, as although one may heat quicker than the other, the whole three would soon become of an even temperature. The mains with this apparatus should be 1¼ inch, but the pipes or branches from the mains into the radiators need only be 1 inch, or ¾ inch will do sometimes.

The service to the right may be supposed to furnish heat to a smaller room, but one of such a character that radiators, however good in appearance, would be objectionable. In this case the radiating media must be put out of sight, and this example shows it placed beneath the floor. In a new building arrangements can be made for pipes to be carried whichever way may be most suitable; but such works as these are more often put in residences already occupied, but which have certain rooms that should have a regular heat, or which the ordinary fire places are not successful in heating. This latter trouble often occurs. There are numbers of rooms, even as large or larger than billiard rooms, that have only one fire place, which cannot heat the whole of the room, although it may be large enough to cause an intolerable heat at the end where it is situated.

The writer's usual plan when the heating pipes have to be beneath a floor is first to see that the room below is an unimportant one—a kitchen or servants' offices; then to cut away the plaster of the ceiling and secure an ordinary pipe coil with box ends up to the joists. Immediately above the coil, on the top side of the joists, a suitable sized hole is cut in the floor boards and a brass grating laid in. The pattern of the grating should be open, yet strong enough to bear being stood upon. Branch flow and return pipes enter the box ends of the coil as shown, but with coils lying flat it is best to let the flow pipe enter at a point as far removed from the return as possible, so as to insure the passage of hot water through all the pipes. (It is not as if the coils stood upright, when it is recommended to connect all pipes at the bottom only, as the heated water then readily finds its way through the top pipes without any special provision.)

Thus far the arrangement is sufficient to heat the room, as although the coils are on the ceiling of the room below, all the heat would come up through the joists and gratings, but there are two things further to consider. First, the coils would have an exceedingly bad appearance below, and secondly, and most important, all

the impure air and possible odors (if a kitchen) will come through with the most undesirable speed imaginable. The coils must be boxed in below; this will totally hide them and will make the ceiling sound, and, when whitened, of ordinary appearance except for the square box projections that must exist. To do away with those boxes the joists would have to be cut through and trimmed to make a space for the coil; this would be a somewhat expensive and troublesome undertaking. Notwithstanding the box below, which quite shuts off communication between the room above and below, the spaces between the joists should be soundly stopped also, or air may be drawn this way from disagreeable sources. When this is done the coil will heat theair of the room only; it will be practically a coil in a box, or well, sunk in the floor, but, if convenient or desirable, a fresh-air conduit could be led to it from outside. There would then be a rapid inflow of air, warmed by contact with the coil, and an inlet of this kind always goes to reduce the disagreeable drafts at doors and windows.

Air cocks would have to be put on the highest points of the coils, and when requiring attention could be got at by removing the gratings. If this is inconvenient, small tubes can be carried from the same points, but either up or down, whichever is best, and terminating with cocks.

With an apparatus like this an expansion pipe should be provided; ¾-inch would do, and the proper point for it to start from would be in the flow pipe somewhere between the two stop cocks. The cold supply would be provided for by a good-sized cistern fixed at any point from 1 foot to 4 feet above the top of the highest radiator, Fig. 98. The supply pipe might be led into any of the return pipes with the necessary dip or syphon.

Doubtless many of our readers have heard that it is proper in some instances to connect all radiating pipes, coils, &c., to the main return service only. This is correct in some cases, but in none of the examples yet given is it necessary or desirable. The methods shown are as good as any. The idea of putting all radiating media on the main return arises from the argument that the service pipe which has the greatest weight of water in it or connected with it should be the one that has the water descending within it when at work. In other words, if the flow pipe had a greater bulk of water in connection with it than the return it would tend to be an obstacle to the upward direction of the water when it goes to rise up this pipe, and having a greater amount of water to displace than there is in the return pipe it might bring about a reversed or retrograde circulation.

This theory is broken down a great deal now, yet, at the same time, when an apparatus extends in a vertical direction a good hight, and the engineer has any fear of such a result, he may put his coils all on the return, as Fig. 98, for instance. This shows an apparatus with a boiler in the basement, but going to heat two corridors or rooms a floor or two above. If it was feared the upper coils, or pipes, would give better results than the lower, then the circulation to each could be equalized by running the services as in Fig. 99. If it is not desired to make the connections wholly with the return pipe, then it could be carried out as in Fig. 100, which is, perhaps, the most customary way of doing it now.

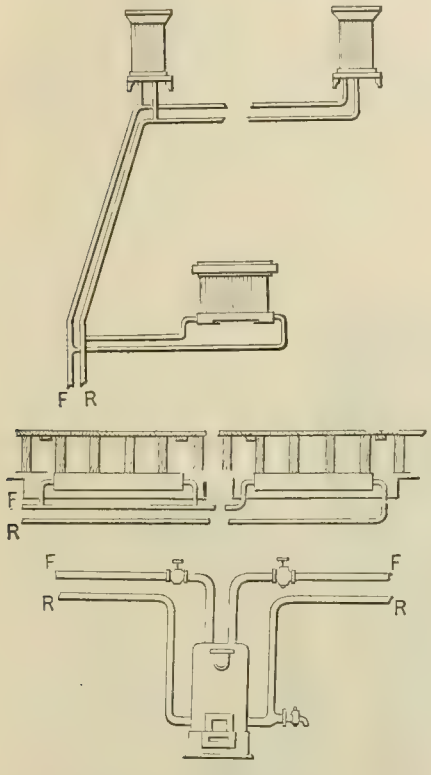


Fig. 97.—Showing Boiler and Connections for Heating Two Rooms of Different Size and in a Different Manner.

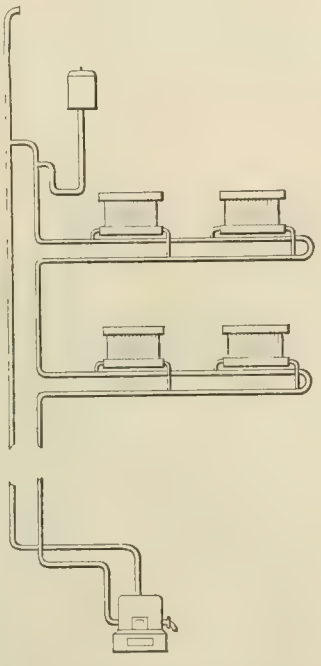


Fig. 98 —Another Arrangement which may be Employed.

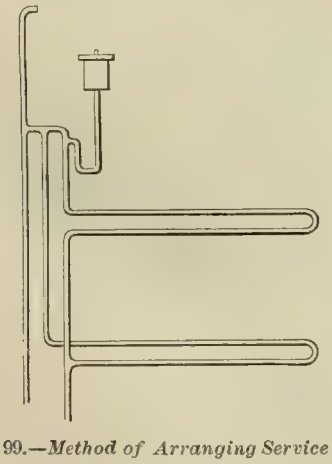


Fig. 99.—Method of Arranging Service Pipes to Secure Equalization of Circulation.

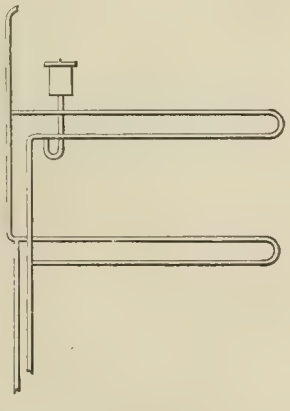


Fig. 100.—Customary Method of Arranging Service Pipes.

ENGLISH PRACTICE IN HOT-WATER HEATING.

HEATING NOTES.

The Richmond Stove Company, Norwich, Conn., have gotten up blank forms that have more than the usual interest for the steam and hot-water heating trade. One of the forms is an estimate of cost, &c., for heating apparatus. On the outside lines are left for all the particulars of owner, date, contractor, location, &c. Within, the blank is suitably ruled for making a complete estimate of cost, one-half being memoranda for radiation and the other memoranda of cost. All the items that enter into a job of this kind are provided for, and space is left for memoranda of sundry estimates. The blank will be found most convenient for those who are estimating on steam and hot-water heating work. A second form issued by the same company is a specification and contract, leaving blanks for the insertion of the amounts, &c., relating to the particular job in hand. A similar form of contract is prepared for steam heating.

The B. F. Sturtevant Company, Boston, Mass., have printed a third edition of 10,000 copies of their 200-page General Catalogue No. 61, which describes the uses of their blowers, exhausters, engines, forges and heating and ventilating apparatus.

The Raymond & Campbell Mfg. Company, Middletown, Pa., distribute an attractive little circular, printed in red and black ink, respecting the Lindemuth Sun steam and hot-water heaters of their manufacture. In the pages are given full particulars of this apparatus, and numerous illustrations show all its features of construction. A price-list and table of sizes accompany the text.

The excellence of our fruit carrying service by rail excites the admiration of foreign visitors to the United States.

The Pittsburgh Gas Engine.

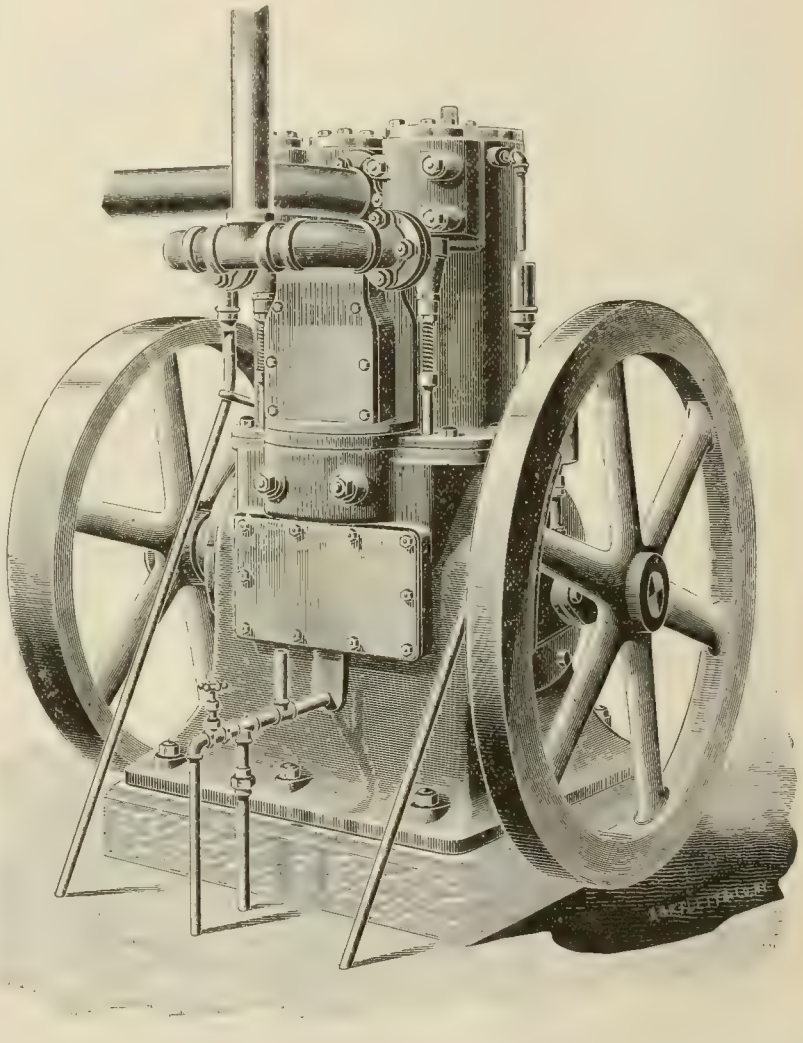
In designing the Pittsburgh gas engine the aim of Albert Schmid, superintendent of the Westinghouse Electric & Mfg. Company, and of Mr. Bechfeld, was to produce an engine possessing the following characteristics: Close regulation under the widest variations of load; an admission device that would admit gas in quantities exactly proportioned to the power required; an ignition device that would be absolutely positive and efficient in its action; to provide complete jacketing and thorough lubrication; and to be compact and simple in its general design and to have all parts easily accessible.

The engine here illustrated is made by the Fuel Gas & Mfg. Company of Pittsburgh, Pa., in sizes from ¼ up to 200 brake horse-power. As the principles of design and operation are the same for all these engines, a brief description of a single example will embody the characteristics of the whole class. The most striking innovation is found in the use of a crank chamber to inclose the bearings and lower end of the cylinders. This chamber is filled almost up to the shaft with a mixture of oil and water, into which the crank shaft and connecting rods splash at every revolution, so as to completely deluge the bearings, piston and interior of the cylinders, thereby not only affording copious self-lubrication, but also supplying an efficient jacket to the piston. Oil for the crank chamber is introduced through the main bearings, which are supplied from the only two oil cups on the entire engine. A simple pipe connection with a city main supplies the necessary water. Another pipe, serving to carry off the overflow, is made, by means of a funnel head, to indicate the level of the lubricants in the crank chamber.

All the Pittsburgh gas engines are built with two cylinders on a single shaft, and, as usual, abnormal heating is obviated by the employment of water jackets. Each revolution made by the engine operates valves admitting the gaseous fuel alternately to the one or the other cylinder. As the period of admission is controlled by a positive action, the crank shaft receives an impulse once each revolution, no matter what the load, but the energy of that impulse is predetermined by an independent piston valve. In order that the maximum amount of energy may be developed by the explosion of the gaseous fuel, there is but one value that the relative amount of gas and air can bear to each other. This value has been determined by a prolonged series of chemical analyses, and the company now design their measuring piston valve so that it shall always admit gas and air in their correct proportion for producing the correct maximum result, but at the same time vary the total amount of mixture directly as the work of the individual piston stroke.

The governor regulates the speed and controls the admission of gas to the cylinders. It is mounted upon the shaft, between the cranks, and, by direct connection between the eccentric rod and valve stem, insures an accurate and positive travel to the measuring slide valve.

The igniter employed is of the electric spark type. It consists, in brief, of an arm operated by a cam. At just the proper moment the arm is made to break an electric circuit, and the arc thus formed—intensified by the use of an induction coil—ignites the fuel instantly. As the arm is actuated by a positive motion, there can be no failure to produce a spark and no failure in the resulting ignition of the fuel. In order that the engine may be entirely self contained, the electric current is supplied from a galvanic cell. If preferred, however, the requisite energy may be taken from a dynamo circuit.



THE PITTSBURGH GAS ENGINE.

The Bessemer Medal.

At a meeting of the Council of the American Society of Mechanical Engineers, held June 22, the following resolution was passed on the presentation to John Fritz of the Bessemer medal by the Iron and Steel Institute of Great Britain:

It having come to the knowledge of the Council of the American Society of Mechanical Engineers that the Iron and Steel Institute of Great Britain has recently bestowed upon a member and ex-vice-president of the society the Bessemer medal for 1893, the council avail themselves of this occasion to tender their congratulations to John Fritz on the receipt of such a well-merited and distinguished honor from his friends beyond the sea.

The council desires to commend the excellent judgment of the Iron and Steel Institute in selecting for this honor one who by his genius, skill and industry through many years has done so much toward the improved metallurgical processes, and especially in the construction of the mechanical appliances now in use in the manufacture of iron and steel in this country, as to have materially aided in making this industry the important one it now is.

That in conferring the Bessemer medal in this the year of our Columbian Exposition upon an American engineer, the institute has in a pleasant way added further evidence of the kindly feelings and hearty good fellowship which in so many ways has of late marked the action of engineering societies and engineers in this country and in Europe, and we cannot but believe courtesies like this tend to a closer union of engineers in all lands; that while it is the mission of our profession to compel the rude forces and materials of nature to contribute to the welfare and comfort of mankind, it is their mission as well to bring in closer touch nations and individuals, and in this way aiding in a degree it would seem no other profession can to bring about those better days which in all ages past the world has hoped and struggled for.

The United States Commissioner of Navigation, in his report for the year ending June 30, 1892, gives the total tonnage of the Lakes fleet, including steamers and sailing vessels, canal boats and barges, as 1,183,582.55, showing an increase of 2.5 per cent. over the figures of 1891. The total number of bottoms was 3657, against 3600 in the previous year.

STOVE TRADE NOTES.

Electricity and the Stove Trade.

The subject of electricity and its possibilities as a heating medium for stoves and ranges is an interesting one, writes a well-known correspondent. While in conversation with a stove man the other day this topic was touched upon. He said he thought the day when electricity would usurp the office of the coal and wood cooking and heating stoves now in use was far distant. His first reason for this opinion was that the cost of producing the electric current was not reduced enough, and would not be for a long time to come, to make it a feasible material for the use of the common people, and it is largely the common people who use stoves. In a comparatively short time, he thought, electricity might be used extensively among the wealthy; but it is out of the question nowadays for the majority. Electricity cannot yet be furnished at a figure to begin to compete with coal; and the stove man thought that, should any competition begin in this direction, the price of coal would be reduced by the producers of fuel so that the electrical commodity would at once be too expensive in comparison with the cheaper fuel for the use of the mass of people who need heat for warmth and for cooking and other purposes.

"But," continued he, "should it happen at some future day that the electrical current could be produced in such quantities and at such a low rate that people not in independent circumstances could afford to use it, it would open up a new field for the stove manufacturer. It would not begin to destroy the stove trade, for stoves, I believe, will always be used in certain localities. If the electrical stove becomes a reality, instead of, as at present, a speculative production, the big stove manufacturers will at once turn their attention to the production of handsome bodies in which to insert the electrical heating apparatus, and to which the supply wires can be attached. This would surely give them as much of a field for manufacture as they have at present, and I believe that an immense business would be developed. It would afford much opportunity for the exercise of inventive ingenuity and would practically revolutionize the business of stove manufacturing in part, though, as I said, I do not believe that it would oust the coal and wood stove. However, a great deal of this is speculative, and until the day of the electrical stove comes no one can tell with definite prediction the probable outcome of the use of electricity as a heating medium for cooking and supplying warmth. There are many difficulties yet to be overcome and many devices to be planned and invented."

Indirectly the conversation touched upon the probability of there being a supply of stoves some day and a consequent falling off in the business of their manufacture. The stove man simply replied to this query by pointing out the fact that each year there were as many, if not more, couples getting married than the year previous, and that new couples needed new stoves. Altogether, he said the stove business was not likely to diminish for many years to come, if it did at all, and the demand for stoves and ranges bids fair to be good for a long period in the future.

The Future of the Hot-Air Furnace.

BY A. W. GLESSNER,

President of the Excelsior Steel Furnace Company, Chicago, Ill.

At the recent meeting of the Stove Manufacturers' Association, held at the Palmer House at Chicago, May 29 to 31, I am told that the status of the hot-air furnace, past, present and prospective, received careful consideration at the hands of the members present at said meeting and that the opinion was freely expressed that the days of the hot-air furnace were numbered. The reasons assigned for the early demise of my old friend, the said H. A. F., were, I am informed, chiefly that there had been no improvements made either in the construction or the installation of furnaces during the past few years and that heating by the means described continued to be very unsatisfactory, while on the other hand marked progress in steam and hot-water apparatus and installation was apparent, and these forms of heating were rapidly displacing the hot-air furnace in the better class of houses, while in the cheaper classes the furnace was about to be superseded by the improved ventiduct and double heaters made by the members of the association referred to.

These opinions, evidently carefully considered, sounded the death knell of the hot-air furnace and I was about to make preparation for the funeral when the issue of *The Metal Worker* chronicling the proceedings of the Convention of the Master Steam and Hot-Water Fitters, just held at the Revere House, Chicago, reached my desk and in reading the address of the president of the association upon the assembling of that body my eye fell upon the following commentary upon the effect on the steam and hot-water trades of the poor work done by novices in these lines during the past three years:

"Many business men have been materially injured by this method in the past three years, and the miserable success that has been met with on account of it has offered an almost unanswerable argument for furnace heating, and has caused much of the latter where hot water or steam would have been used if the faith of owners had not been entirely shattered by the miserable success their friends and neighbors had met with, which is chargeable wholly to the want of experience on the part of the man who lost money doing a wretchedly poor job.

"The sum of it all is, capital has been wasted in large quantities, contractors have been crippled; the public has been injured and imposed upon, and our line of business has received a set back that it will take a long time to recover from."

In comparing the opinions of the stove makers with the statements made by the president of the Master Steam and Hot-Water Fitters, the outsider would, naturally, give greater credence to the latter, for the reason that the former were simply discussing a theory, and a very pleasant theory at that, while the latter was stating a condition, and an exceedingly unpleasant one, to the organization of which he was the official head.

It might also be argued that the Master Steam and Hot Water Fitters, who are practical men and who come in actual competition with the hot-air contractors, would be better qualified to express an opinion on the future of the hot-air furnace than the stove makers, who occupy a plane so totally different from that of either the hot-water or hot-air contractors as to partially obscure their vision when dealing with this subject. The stove makers produce an article which, when properly made, requires for its installation a very small amount of intelligence, and practically no knowledge of the construction of the article or the scientific principles governing the construction of the same, whereas the hot-air furnace maker or boiler maker is producing an article which requires for its successful installation fully as much if not more intelligence, experience and judgment than for its successful manufacture.

In regard to the statement that there has been no improvement in furnace construction within the past few years I would say that there has been no radical departure from the older forms of furnaces, as experience has shown that these forms were effective and economical when properly installed and operated, but there have been improvements, and decided improvements, in the little things that go toward the making of the perfected apparatus, and while not apparent to the casual observer they are known and felt in the furnace trade. That there has been no improvement in the art of putting in furnaces and the science of hot-air heating I most emphatically deny. It is true that yearly there are hundreds of furnaces put in by novices which fail to give the satisfaction that was expected of them, just as there are hundreds of steam and hot-water boilers put in each year by inexperienced contractors and workmen which totally fail to do the work anticipated, but there is everywhere throughout the country a keener interest felt by the contractors of hot-air heating in the science of such heating and an earnest desire to improve in the art of locating and installing furnaces which is leading to much better work, and the general average of work done within the past two years has been very much raised, and the prospect ahead is for still better work. Much thought and study must be expended by the hot-air contractors in the planning of their work if the best results are to be obtained, and the co operation of the architect and builder must be had if great progress is to be made, as no class of labor has so much to overcome in the way of obstacles as that of the furnace contractors. But the improvement is constant and gradual and the results are apparent at the end of each year, and

these results do not point to an early death of the hot-air furnace.

(To be continued.)

Of Possible Interest to the Stove Man at the Fair.

In the Horticultural Building D. Stutzman of Ligonier, Ind., exhibits various sizes of the Stutzman improved fruit evaporator for drying all kinds of fruits. It is designed more particularly for farmers' use, a small size being made to work on the back of an ordinary cook stove. A current of warm air passes over the fruit, which is arranged in layers in a series of trays, and ample provision is made for the air that becomes charged with moisture to escape. The evaporator is made in different sizes to meet the requirements, the larger sizes being supplied with grates for heating.

Confectioners & Bakers' Supply Company of Chicago show candy furnaces, ice-cream freezers and a great variety of molds and utensils that are indispensable in the bakery and candy kitchen. The candy furnace is made in different sizes, with a series of rings on the top to give a large or small opening for different sizes of kettles.

The Hubbard Oven Company, Chicago, Ill., show one of their large size sectional portable ovens, as used in restaurant or hotel kitchens, with a pipe coil in the fire chamber for heating water in a circulating boiler. The oven has a cast-iron front with doors, and the sides are made of galvanized iron lined with non-conducting material, and the parts are fastened together with bolts. The shelves in the oven are made of slate, and a Fahrenheit pyrometer is arranged at the front so that the temperature of the oven can always be readily told. The oven stands about 5 feet high, is 6 feet long and 5 feet wide, giving a capacity for a large baking in a comparatively small space.

The Middleby Oven Company, Boston, Mass, show a bakers' oven that has the advantage of being portable and yet works in the same way as the usual brick oven. The fact that it can be moved should a baker find he has selected a poor stand or may be installed where a landlord will not go to the expense of building a brick oven is a recommendation that will be appreciated. The oven consists of a cast-iron frame work and a galvanized iron casing lined top, bottom and sides with 3 inch thick fire brick, having a 6-inch space filled with sand between the brick and the casing. A fire chamber is built in one corner with a convenient grate and ash pit underneath. An automatic damper works in connection with the door, so that when the door is opened the damper opens in a pipe which connects with the main smoke flue. This effectually prevents a blast of hot gas or steam in the face of the baker when he forgets to open the damper, and prevents the damper being left open when it should be closed. The record of sales shows an increase in demand as the oven becomes known.

New Stewart Stoves.

The Fuller-Warren Company have samples of their new Splendid Stewart base burner on exhibition in their Chicago salesrooms. The design of this stove is thoroughly new, although it is of the familiar square type. It is peculiar in the blending of the ash-pit section with the body of the stove in unusually harmonious relations with each other. There is no violent change of form, but graceful curves and rounded corners predominate equally in all parts. The sides and front of the ash-pit section are constructed with swelling panels beautifully carved. The body of the stove is circular, with numerous fret work mica doors through which every part of the fire pot can be easily reached. The top is of the deflector pattern, full nickeled. The dome is surmounted with a brass ornament of very handsome design. The interior construction is fully in keeping with the fine exterior. The grate is the Ransom combination duplex, and the fire pot is Fuller & Warren's patent sectional. The magazine cover acts automatically. Special care has been taken to secure a perfect damper system. The grate is operated from the outside. A large hot-air flue with a 6-inch opening at the bottom increases the heating power of the stove and enables it to be used as a double heater. Three sizes are made—13, 14 and 15 inch. The 14-inch is also made with a low oven. The P. P. Stewart base burner, which proved very popular last year, has been changed in some respects, improving very materially its already handsome appearance. A black frontpiece now runs down the body instead of the full nickeled piece of last year.

The Yeager-Hunter Spring City Stove Works

of Spring City, Pa., have issued from the press their annual catalogue of stoves, ranges and heaters. It is a volume of 100 pages, measuring 8¾ x 10 inches and bound in colored paper covers. The side title consists of the name and address of the company embossed in old gold script letters. The opening pages are devoted to announcements of interest to the trade, among which may be mentioned suggestions to customers on the subject of stove repairs. The leading place in the publication is given to the Model Chester, a six-hole range made in two sizes, and arranged for using horizontal or upright boiler, according to requirements. The ornamentation is very attractive and the constructive features of the latest pattern. Following this stove attention is invited to a variety of cooks and ranges made under such names as Grand Active, Queen New Era, the latter being something entirely new and having the oven door fitted with a heavy beveled French plate glass, surmounted with a nickeled name frame, bringing all parts of the oven to view when the door is closed; the Model New Era, the New Treasure, Roselle, Fireside, New Chester, Art Chester, Index, New Commercial, New Etna, Rego, Earl, Bertha and Unique. The heating stoves occupy fully one-half of the catalogue, the place of honor being given to the Active New Era, a square parlor stove made with full revertible flue. Reference is made to the system of air circulation in this stove, the ducts being so arranged as to take in the air from the back, and forming, it is claimed, a direct suction. The Active New Era has duplex and Ransom patent shaking grate combined, as well as other features of obvious utility. The Mascot and Maywood are conspicuously ornamented heaters, embodying the modern improvements. The Capital New Era, made in one size as a double heater; the Keystone, Signet, Modest New Era, Alway, Esther, Berwick, New Telephone, Espy, Positive, Sunrise, Star, Pilot and a miscellaneous assortment of globe, cannon and laundry stoves are included. Several pages are given up to a presentation of the merits of the Royal wrought-iron cylinder furnace and the Fearless steel-plate furnace. A list of hollow ware and of stoves for which fire brick can be furnished are features of the volume.

ODD PLATES.

The Richmond Stove Company, Norwich, Conn., favor us with an interesting little pamphlet entitled "The Richmond Recipes, with Hints and Helps for Mother, Daughter and Wife." The title suggests its contents, but scattered through its pages are illustrations with descriptive particulars of some of the Richmond stoves and ranges. There are also given tables of weights and measures in common use, time required for cooking summer and winter vegetables, and *menus* for plain and special dinners. At the close of the pamphlet is a table of contents and a few testimonials relating to the Richmond ranges.

The Art Stove Company of Detroit, Mich., have just completed their new engine room, which is built of brick in a substantial manner. It embodies all the modern improvements, and in it will be installed a very fine engine. We understand that this is the third time since they commenced business that the company have been compelled to increase their motive power.

The Bennett & Peck Heating and Ventilating Company, Cincinnati, Ohio, have recently put in one of their apparatus at College Hill, Ohio, also one for the Board of County Commissioners at Dayton, Ohio, while a third one has been installed at the courthouse at Brownstown, Ind.

The new plant of the Central Stove Works, Foster & Brothers, proprietors, Lebanon, Pa., is well under way, the buildings having been completed and the engine placed in position. The proprietors are daily receiving shipments of material and expect to be in readiness in all departments of the works by August. The first floor is used for office and storage purposes, the second is a finishing department, while the other floors will be employed as circumstances may require.

Anton Weiskittel, of the firm of A. Weiskittel & Son, Baltimore, Md., is the patentee of an improvement in gas stoves, and which relates to the construction of the pilot light. The stop cock is provided with a valve having a handle, while an ignitor connects with the cock in advance of the valve, so that the flow of gas to the ignitor is not affected by the adjustment of the supply valve. An important feature of the improvement is found in the fact that the movements of the ignitor are entirely independent of the supply valve of the burner, so that when the ignitor has served its purpose to light the gas at the burner, it may be adjusted out of the way of the latter, and, in fact, entirely out of the stove, if desired. It is claimed that this arrangement avoids any injury to the ignitor which might result from its continual heating by the stove burner, and it also enables the use of the pilot light to illuminate, in a measure, the room in which the stove is used.

William N. Moore, president of the Joliet Stove Works, Joliet, Ill., has patented a heating stove in the base of which are cold-air chambers extending entirely across from side to side and provided with openings for admitting and discharging cold air. Resting on

the base plate is a fire pot, supported by and secured to which is a parabola-shaped dome. An outer casing rests on and is secured to the stove base for the purpose of forming a chamber between it and the fire pot and dome and connected with the cold air chambers by means of flues.

Among the articles admitted free into Guatemala under the reciprocity treaty between the United States and that country are fire bricks, tiles of clay or glass, clay pipe, plain or barbed wire, iron railings and balconies, iron fire places or stoves, and machinery.

The Kernan Furnace Company of Utica, N. Y., are the assignees of a patent granted a short time since to William J. Owens of that place, for a hot-air furnace. The fire pot, or dome, of the furnace has a feeding section extended to the outside of the casing, within which is a draft flue which nearly encircles the fire pot and terminates at each side of the feeding section and having a series of openings into the fire pot above the fuel line. There is also a heating box within the casing below the feeding section and connected by equally contracted air passages with the ends of the encircled flue. These air passages are at right angles with the plane of the draft flue. The patentee states that the peculiar construction and arrangement of the heating box and draft flue provides for a first heating of the air in the box and a second heating in the flue. The heating box is connected with the ash-pit base by means of a flue and provided with a damper.

A. T. Nye & Son of Marietta, Ohio, are furnishing their new line of Leader oak stoves with heavy cold-rolled sheet body, lined fire pot, draw-center grate, smoke guard on the upper door, square base and nickel plated trimmings. Their new dwarf stove, known as the Opal, is offered in two sizes and is arranged for burning wood, coal or gas. It has large double front doors, half-pouch feed, single lower front swing door with iron slide, deep ash pit and two griddle holes in the top. These new goods, we understand, will be ready for the fall trade. The firm have also added a neat Leader coal cook to their assortment, and announce that five sizes are now ready. Its constructive features include oval fire box, extra wide bottom grate, large broiling and toasting surface, half swell oven doors, large bailed ash pan, cut top, Boston ring covers, draw-out hearth, and a system of oven ventilation which is claimed to be entirely satisfactory. The cook stove is referred to as being first class in all particulars, while the ornamentation is neat and effective.

The Famous Stove Company of Indianapolis, Ind., have issued a number of sheets illustrating some of their goods, to which they invite the attention of the trade. For the most part they relate to heating stoves, prominent among which may be mentioned the Magnet Oak, made with either sheet-steel or cast-iron body, heavy fire bowl and nickel trimmings. It is made in five sizes and is adapted for burning coal or wood. Under the name Magnet Franklin the company offer a very neat construction for coal or natural gas. It has round fire pot, draw-center grate and a blower made with sliding upper doors and swinging lower doors. The Home Cottage is another attractive heater made in several sizes and having two griddle holes under the swing cover. The Magnet is another member of this general class, but adapted for burning wood or gas. The Penn Franklin is made with round fire pot and sliding upper mica doors, giving the stove, it is claimed, all the advantages of both open and closed constructions.

Danville Stove & Mfg. Company, Danville, Pa, and 284 Pearl street, New York, are putting on the market two ranges, which are advances on similar goods made heretofore. The Queen Beaver is made in three sizes, viz: 8-21, 8-23 and 9-23. It has a heating attachment designed to use surplus heat for warming floors above, instead of losing it in the chimney. It is furnished with either solid or portable hearth. It has a backguard to prevent cooking or other utensils being forced off the top, and attached to this guard are two nickeled swing shelves on which dishes, &c., may be placed Reservoirs for heating water are placed at one end and can be had constructed of copper or iron. The range is supplied with or without reservoir. In the oven door at the bottom are four holes for tempering the heat of the oven by opening or closing. For purposes of embellishment a nickel band is furnished to go on the edge of the top. This range has six holes. The other range is termed the Prince Beaver. It is made in 8-18 and 9-18, with solid hearth. It has either triplex or flat grate, and is made with and without reservoir. The backguard made for the Queen Beaver will fit this or any other range made by this company. The two new pipe shelves are specially attractive and interchangeable.

The Wood Stove Foundry at West Troy, N. Y., has started up again on full time.

American gas and oil stoves, says the *Gas Engineers' Magazine* of London, are in use in Australia, France, England, Belgium, Canada, Mexico, and, to a lesser extent, in Central and South America.

No. 5 Wabash avenue, Chicago, is now the scene of a glittering display. E. A. Ireland has just unpacked and arranged for show a shipment of the latest style of urns and ornaments for stoves, and a visit will be sure to please the eye. The Western manufacturers will be well cared for by the efficient manager of the Chicago house of the Matthews & Willard Company of Waterbury, Conn.

An improvement in gasoline stoves forms the basis of a patent granted June 13 to Charles Anson Frayer of Keithsburg, Ill. The invention has, in some degree, a likeness to what is well known in steam machinery as the "sight feed," and the claim is intended to cover the novel means by which this idea is carried out in its adaptation to gasoline stoves. A hollow pendant attachment for a gasoline stove is provided with openings in its sides, and an internal glass cylinder for covering the openings. There is also provided a screw thread cap, having a screw thread opening, and located in the upper portion of the pendant, to hold the glass in place and afford a means by which to attach the pendant to a distributing pipe. The inventor refers to the advantages of this invention, especially in connection with the New Process stoves. As now made it is claimed that the fluid drops from the exits in the receiver or pendant upon a gauze and the amount of drip regulates the size of the flame. He states that under this arrangement it cannot be ascertained without removing the can just how much the drip is, or whether it is dropping at all, but by the device recently invented it is claimed that the drip can be seen at all times. Mr. Frayer has assigned the patent to himself and to George M. Clark of Chicago, Ill.

Grange Sard, vice-president of Rathbone, Sard & Co. of Albany, N. Y., has returned with his family from a trip to the Chicago Exposition. He had a very enjoyable time.

At the Fourth of July Celebration at Troy, N. Y., the stove manufacturers of that city will take a prominent part by having a number of handsome floats representing the trade. Bussey & McLeod, Fuller, Warren & Co., Phillips & Clark Stove Company, and Burdett, Smith & Co., as well as others, will make a fine showing.

The Backus heater, made at Williamsport, Pa., by the Backus Portable Steam Fireplace Heater Company, is seen in many different buildings at the World's Fair, using gas for fuel.

William S. Essick has resigned the office of president and manager of the Keystone Meter Company, and will at once engage in a brokerage business, handling principally pig iron, coal, coke, tin plates and metals. Mr. Essick is well known to the stove trade, having been actively engaged in that department of business from 1877 to 1890, and for several years was secretary of the Buckwalter Stove Company of Royersford, Pa. In his recent departure he will have occasion to renew many old acquaintances among the manufacturers and dealers, among whom he is so pleasantly and widely known.

A notice has been issued under recent date that after a long and successful career as a manufacturer of foundry facings, Robert Mackellar of Peekskill, N. Y., has retired from business. He has been succeeded by his sons Archibald and W. H. H. Mackellar, who will carry on the business under the style and title of Robert Mackellar's Sons, at 638 Central avenue, Peekskill, N. Y. Archibald Mackellar has been connected with the Peekskill facing mills for the last 25 years, and W. H. H. Mackellar has been engaged in the same line of business in the West.

The plant of the Toledo Stove Works of Toledo, Ohio, was slightly damaged by fire, which broke out in the front portion of the building on the evening of Friday, June 16. The damage, which was very slight, was fully covered by insurance.

Grinberg Brothers of 154 and 155 South street, New York, have issued an illustrated price-list, of a size convenient to carry in the pocket and consisting of 24 pages, profusely illustrated and bound in colored paper covers. The greater portion of the matter relates to Eagle gas and oil stoves as manufactured by the firm named. Attention is also given to ovens adapted for use with gas and oil stoves, and also to the Eagle elbow, stove pipe, dampers, &c.

Danville Stove & Mfg. Company, Danville, Pa., and New York office at 284 Pearl street, are offering an improved heating stove, known as the Princess Beaver, made in sizes 12, 13 and 14. Nos. 12 and 13 can be had in half-revertible flue, while all sizes are made with full revertible flues. The double heaters are furnished in sizes 13 and 14 only. While not radically different from heating stoves heretofore made by

this house, it has been remodeled so as to present an exceedingly attractive appearance. It has bulged doors and much nickel ornamentation, with the popular cabinet base nickeled, supplied with their various heating and cooking apparatus. This cabinet base permits of the stove being properly located by first placing the base in position and then lifting the stove or range into its place on the base.

The Excelsior Steel Furnace Company, 110 to 114 South Jefferson street, Chicago, have begun the issue of a little sheet called the *Excelsior Bulletin*, in which they discuss practical questions of interest to the furnace trade. The number before us treats of the cost of hot-air elbows, double safety stacks, &c.

The Peninsular Stove Company of Detroit, Mich., are distributing, with their compliments, a booklet entitled "The Child's Pictorial," which tells the story of "three little pigs." It is illustrated with numerous engravings, and, in its way, is likely to interest and amuse the little ones at home. The second and third pages of the covers are embellished with advertising matter of the Peninsular wrought steel ranges and warm air furnaces. The fourth page of the cover carries a *facsimile* of the company's trade mark, together with the name and address, and the statement that a written guarantee accompanies every Peninsular stove, range or furnace.

Chas. C. Heath & Co. of Baltimore, Md., are not adding this season to their lines of furnaces, heaters and ranges, nor have they found that they could make any improvements of importance. With the exception of one or two very slight changes their lines, therefore, will be identical with those of last season. The firm, however, in view of the success which attended their efforts last season, have made ample provision for the speedy and prompt fulfillment of all orders for their Active Domestic and Ideal furnaces and their fire-place heaters, their line of the latter including the well-known Grand Domestic, Bristol, National, Domestic Jewel, Chelsea, Linden and Crystal heaters. They are also prepared for the usual large demand for their Domestic and other ranges.

Governor Russell of Massachusetts recently discussed the World's Fair with a reporter of the Chicago *Herald* in a breezy way, referring to many things among the exhibits that he had noticed. The great stove of the Michigan Stove Company had made an impression on him, as is to be seen from his remarks on the subject, as follows: "Here, for instance, is a cook stove. You wouldn't think there was anything sensational or picturesque about a cook stove, would you? But there is, in the hands of a man entirely a Yankee. 'How shall I attract attention with my exhibit?' was the question with this particular Yankee. 'I don't know much about pavilions, and statues, and decorations, and hangings,' he probably said to himself, 'and if I go into that sort of thing I shall make a botch of it. I won't go into it. What I do know is stoves; with me the stove is the thing. By Jove, a stove it shall be!' So he builds a stove as big as a country schoolhouse, puts his other stoves within that, paints a sign on the outside of it in letters 2 feet long, illuminates the interior with electricity, and asks his friends to step in and see what he has to show. Of course it is a success. It may not be artistic, but who cares for art in the stove business? It catches the eye and rouses curiosity, and that is the main thing."

Rathbone, Sard & Co. of Albany, Chicago and Detroit, are distributing, with their compliments, a little pamphlet of pocket-size relating to Acorn stoves and ranges. The story is told in verse of Columbus discovering a new world and while yet far from land he notices a mysterious something floating in the water. With a fish net he scoops it up and finds it to be a monstrous acorn upon which is the startling inscription "Rathbone, Sard & Co., Acorn Stoves and Ranges."

John Utter, accompanied by his wife, left a short time ago for Chicago, where they expect to remain for something like two weeks. They are daily visiting the World's Fair, and in a letter to Sam they state that they are having a very enjoyable time.

Joseph Mackey, treasurer of the Fuller & Warren Company, Troy, N. Y., was in the metropolis last week visiting friends in the trade. He remained several days, and during his sojourn was the guest of J. D. & C. C. Lincoln.

"The Columbian World's Fair Souvenir Diary" is the title of a little book of a size convenient to carry in the pocket which is being distributed with the compliments of the Brand Stove Company of Milwaukee, Wis., and Chicago, Ill. The first few pages are devoted to advertising matter relative to the goods made by the company named, following which is information of interest to those visiting the World's Fair. The body of the little volume is intended to be used as a diary, there being spaces ruled for two days to a page, and the period covered being that during which the exposition is to be open. There are also several blank pages for purposes of memoranda. The book is gotten up in such a way as to prove useful to the owner, while serving to keep constantly before him a reminder of the line of goods manufactured by the Brand Stove Company.

The Union Stove Works of 70 Beekman street and 66 and 68 Gold street, New York, send us a circular of what is known as the Astor No. 25 eight-hole double oven range. It is made in portable form and for brick setting, according to requirements. The castings are highly finished and extra heavy, while the broiler opening is large, the double top removable and the ovens constructed of wrought iron. The stove is provided with dust-flue attachment, powerful water back and full low hot closets, together with sifting grate and ash pan. The manufacturers refer to this range as the handsomest of its class now before the public and as embodying the latest improvements.

The Thomas White Stove Company,

with offices and foundry at the corner of Fifth and York streets, Quincy, Ill., favor us with a copy of their thirty-first annual catalogue and price-list of stoves, ranges and hollow ware. The volume of 80 pages is bound in yellow paper covers carrying a side title, the design of which embraces a *fac-simile* of the company's trade-mark. The goods shown include a varied assortment of cook stoves, ranges and heaters, which are made in the usual styles and sizes. Special attention is invited to the Royal, a six-hole range for burning coal and offered in the usual modifications. The Home Royal for coal, the Royal Herald, a member of the same class, and the Prize Royal are among the other ranges illustrated and described. The cook stoves are offered under such names as the Modern Royal, adapted for burning coal or wood as a fuel; the Royal Garnet, the Prize Royal, the Gem City, Royal City and Forest City. In this catalogue the company show a very complete line of heaters for coal and wood, made in a variety of styles and sizes. The Royal Princess is a neat Todd stove and occupies the place of honor. It is made in one size only, and among its novel features may be mentioned openings in the bottom for removing ashes without disturbing the fire and for checking the draft. The stove also has automatic damper, which opens and closes with the door, or can be worked independently, as may be desired. The manufacturers make special note of their line of oak stoves for coal or wood, and which are made under such names as White's Oak, the Royal Oak and the Argus Oak. These embody the modern features and are referred to as being first-class in every particular. We also notice the Charm, a very neat soft coal base heater, with nickel-plated upper section, revolving fire pot, anti-clinker pull-out grate and extra damper; the Novelty, Pallas, Queen and Mary fancy parlor stoves for coal or wood; the Ocean Wave and Snow Bird box stoves, the Mary, Triumph and Novelty parlor cooks and the Jewel, Argus, Trump and Silver cannon stoves. The catalogue is neatly arranged and concludes with a list of stove hollow ware subject to special discount.

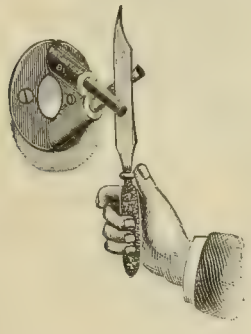
The Famous Aurora Base Burner.

The Brand Stove Company of Milwaukee and Chicago have brought out a new anthracite base burner named Famous Aurora. It is fitted with the Ransom combination duplex grate, has a large tea-kettle attachment and is supplied with a ventiduct of extra size. The flues for this purpose pass up both sides of the ash-pit walls and have no connection with the interior of the stove, thus avoiding leakage of gas. A damper is arranged so as to throw the heated air into the room or through a pipe into another room when used as a double heater. It is a three-flue stove, on the principle first used in the Square Brilliant, made by this company. The general shape of the stove is square, with rounded corners and curved outline. The body is round, tapering in at the top of the mica section. The top is square, with deflectors on three sides, graceful brackets apparently supporting the top. The swing cover is also square, with an appropriate urn of jet, bronze and nickel. The design of this stove is unique. The manufacturers desired something new and distinctive in appearance, and began at the bottom. There is a double foot rail on either side, and another in front in place of the usual hearth. No corners appear in the body section. Very large mica doors swing right and left, opening all the way to the back and overlapping a narrow front piece with a watch-case fit. Below these doors are four slotted hinge doors for inserting a poker, avoiding the constant use of the large doors for this purpose. The magazine is cast with an ornamental design. The entire stove is well proportioned, and will rank among the really handsome stoves brought out this year. Three sizes are made, 14, 15 and 16 inches.

THE RETAIL STORE.

Foster's Knife Sharpener.

John Chatillon & Sons, 85–89 Cliff street, New York, are offering the sharpener as here shown for sharpening carving or other knives. It consists of two straight pieces of steel ⅜ by 3 inches in size, roughened in the



Duplex Steel for Sharpening Knives.

same manner as butchers' steels. The pieces of steel are held rigidly at a proper angle by means of two cast-iron sections, drawn together by a screw and nut in the center. It is intended the sharpener should be screwed permanently to the wall or other convenient place. The knife is sharpened by drawing it firmly between the steels a few times. The entire surface of the steels may be used by turning and reversing them as found necessary.

Little Giant Steel Truck.

The Little Giant Truck Company, Syracuse, N. Y., are introducing the

Little Giant Steel Truck.

truck illustrated herewith. It is described as being made entirely of metal, with well-fitted bearings, with no wood in its make-up to shrink, warp or decay. The truck combines strength with lightness, the manufacturers stating that it weighs but 14 pounds and will carry 500 pounds. The adjustable clamp, operated by an eccentric lever, is referred to as a sure and positive grip on a barrel, and its range of adjustment as permitting various sizes of barrels to be handled on the same truck, while its compactness and practical indestructibility are features emphasized by the makers. The truck is recommended for light general use, such as moving flour, sugar, ash and garbage barrels, &c., and is known as No. 1. A No. 2 truck is soon to be ready for the market adapted for heavy work, such as oil, liquor barrels, boxes, &c. The trucks are finished in japan and vermilion.

Travelers' Drinking Cup.

Illustrations are herewith given of a folding cup which has been put on the market by F. H. Clifford, 265 Dearborn

Fig. 1.—Travelers' Drinking Cup.

street, Chicago. Fig. 1 shows the cup open, ready for use, and Fig. 2 represents it closed. It is made with five parts and a handle. When closed it is about ¾ inch in hight. It is described as being made with a screw in the bottom which works into a slot in the handle, so that by revolving the bottom the screw becomes tightly fastened to the handle, thus drawing the parts together, making a tight package. On

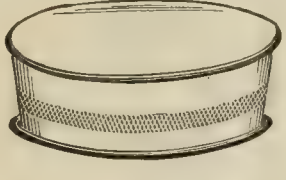
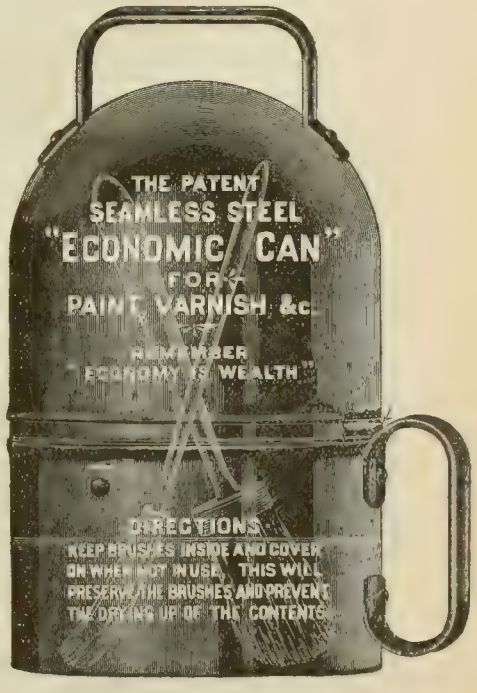


Fig. 2.—Drinking Cup Closed.

unscrewing the bottom the handle is loosened and when the rings are pulled out the handle is thrown over, as shown in Fig. 1 and braced against the rim on the bottom, being further held in place by a slight projection passing through the slot shown on the handle. The cup, it is stated, is then rigid, will not collapse in the hand and can be operated with the handle instead of putting the fingers in the top of the cup as usual. The manufacturers state that it is strongly made of white metal, nickel plated, is handsome in appearance as well as being strong.

Economic Can.

The Wilmot & Hobbs Mfg. Company, Bridgeport, Conn., and 20 Murray street, New York, are introducing the Economic can, as here shown. The can is 9 inches high and 6 inches in diameter. Both top and bottom are seamless, being formed from Swedoh steel, with no seams to leak. Where the two



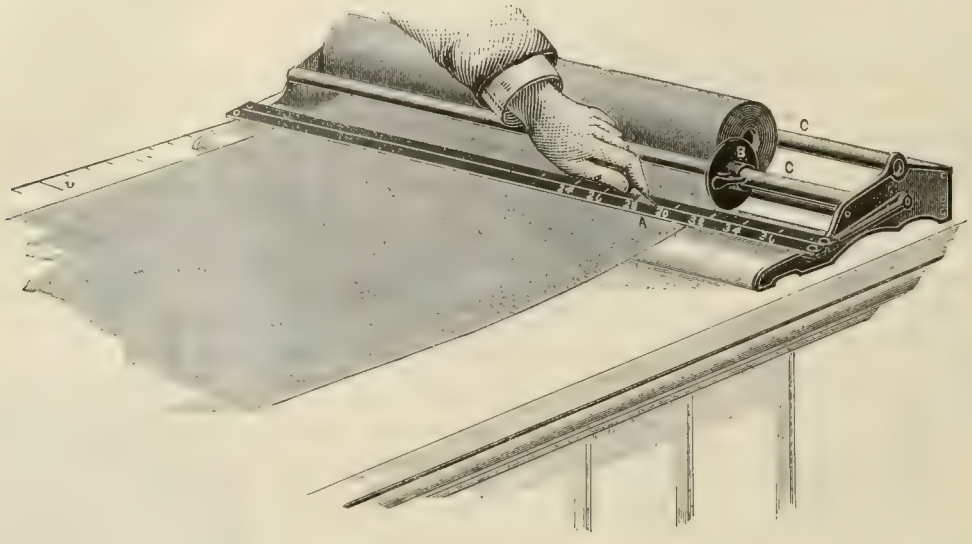
Seamless Varnish or Shellac Can.

sections are joined is a rubber cushion, making, it is stated, a tight joint and hermetically sealing the can. Two wide flat steel springs fastened by rivets, holding the handle to the dome, and projecting an inch or more below the rubber, keep the two parts together, which, the makers say, will sustain 10 pounds weight. There is a piece of metal riveted to the inside of the can, on which the brush may be wiped to relieve it of surplus material. There is also a formation of wire with two hooks that can be slipped on the metal piece alluded to to hang the brush on. The can is black japanned, and very attractive in appearance. The bottom section will hold conveniently 1 quart. The can is designed for the use of painters, pattern and cabinet makers, and all who use fine material, especially shellac and varnish. The hermetical sealing of the can when closed is intended to preserve brushes and varnish by preventing evaporation, thus avoiding the necessity of cleaning the brushes and the formation of skins.

THE HARDWARE FIRM of W. H. Crane & Son, formerly Crane & Parker of Binghamton, N. Y., have been succeeded by Crane & Lockwood. The senior member has been engaged in the business 13 years, and the firm has been a prosperous one.

I X L Combined Wire Cloth Roller, Cutter and Rewinding Machine.

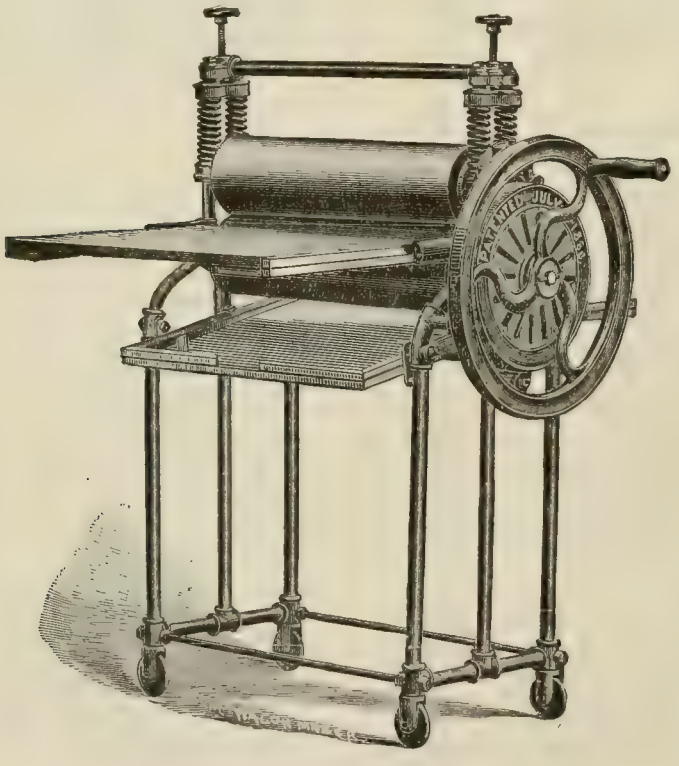
O, P. Schriver & Co., Pearl and Sycamore streets, Cincinnati, Ohio, are putting the above machine on the market, as illustrated in the accompanying cut. The machine consists of a frame in which there are three rolls, C C, which revolve when the cloth is laid on them and pulled out. The washer B is movable on the front roll, and is designed to keep the wire cloth from running sideways. The cutting bar throws back out of the way while the cloth is being pulled out on the counter the length required, ready for cutting off. The bar has a slot corresponding to a slot in the frame, in both of which the knife runs in cutting, thus insuring a straight cut. When the cloth is put in the machine the figures on the frame tell the width, thus avoiding mistakes. For rewinding wire cloth a split bar is used, fitting in holes provided for that purpose in the frame. The manufacturers state that cloth is thus rewound in as compact a form as when it comes from the factory, that 100 feet of cloth can be rewound in a minute and a half, ready to give to a customer, and that remnants as well as full rolls may be unrolled on the machine without any changing of the rolls.



I X L Combined Wire Cloth Roller, Cutter and Rewinding Machine.

The Eclipse Mangle.

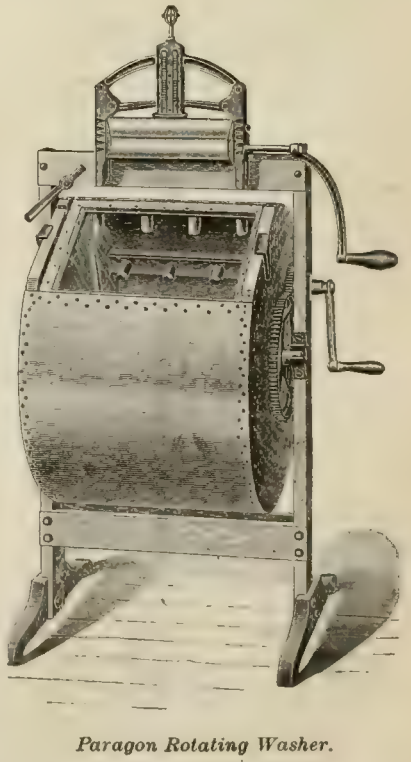
The accompanying cut represents a mangle put on the market by the Lang Mfg. Company, Racine, Wis. The machine is described as having a cast-iron frame tied by wrought-iron bars, with the parts geared to secure a pressure of 2000 pounds, having the gearing so adjusted as to make the operation of the machine easy. The rolls are of selected white maple, treated by a process to prevent shrinkage or checking. The manufacturers claim that by the use of the machine a fine gloss is obtained; that there is no possible chance of scorching the goods, and that a mangle will do the work of six expert workmen, with a child to turn it while a woman runs through the plain goods. The mangles are made in two sizes, 24 and 27 inch rollers.



The Eclipse Mangle.

Paragon Rotating Washer.

Olds Wagon Works, Fort Wayne, Ind., are introducing this washer, as herewith shown. Its operation is described as simple, combining the principles of the old pounding barrel together with the abrasion of the clothes in contact with themselves, being an effective rubbing with the least possible wear and tear. Attention is called to the symmetry and mechanical finish of the machine throughout.



Paragon Rotating Washer.

TRADE REPORT.

The Iron Market.

The week past has been merely a repetition of several preceding, and has developed no change in the Iron market worth noting. Demand has been on the decrease, and prices show increased weakness in many cases. As yet the conference committees representing the manufacturers and the Amalgamated Association have not come to an agreement, although some six or seven meetings have been held. It is not thought, however, that any serious trouble will occur, and a settlement brought about by mutual concessions is expected to be reached at an early date.

Throughout the West the demand for Finished Iron and Steel has been larger than had been expected in view of the depressing financial conditions, as many consumers thought it advisable at last to make some preparation for the anticipated curtailment of production. The increased movement has had no effect on prices, however, which still manifest a downward tendency.

Pig Iron.—In the New York market business is still dull. Curtailment of output recently relieves the selling pressure in some degree, but there is evidently still more than enough Iron to go around, and, on other than particularly favored brands prices are weak, with some business said to have been done in low-grade foundry stock at less than our inside quotations. We quote Northern brands at $14.50 @ $15 for No. 1; $13.75 @ $14.50 for No. 2, at tidewater. Southern Iron, same delivery, $13.75 @ $14 50 for No. 1; $12.50 @ $13.50 for No. 2; $12 @ $12.25 for No. 3; $12.25 @ $12.50 for No. 2 Soft, and $12.75 @ $13.25 for No. 1 Soft.

While the supply of Pig Iron in the Philadelphia market is small the demand is still smaller, so that sales are both few and unimportant, the strong point being that deliveries are freely taken, leaving the furnaces with very little material on hand, thereby enabling producers to maintain firm prices. The demand is not expected to show much improvement during the next couple of weeks, but prices will probably remain about as follows for Philadelphia and vicinity, and from 20 to 30 cents less for Southern Irons at points accessible by water:

American Scotch, No. 1X...	$16.00 @ $16.50
American Scotch, No. 2X...	15.00 @ 15.50

At Chicago contracts covering about 30,000 tons have been secured by local Pig-Iron manufacturers from agricultural-implement manufacturers to cover their requirements during the next 12 months. Southern Foundry grades are weaker than Soft Irons under greater pressure to sell. Lake Superior Charcoal has slightly receded, as makers are, at least to some extent, endeavoring to realize on the stock which they have been so long carrying. The weakness on this class of Iron is for immediate delivery and prompt cash; season contracts would hardly be placed at the prices now current. So many Charcoal furnaces are out, and will probably be for the remainder of the year, that those who are able to carry their stocks expect to realize much better prices next fall or winter. We revise our quotations in the light of recent events, but they are subject to concessions in nearly every case for immediately delivery and for prompt cash.

Lake Superior Charcoal.....	$15.75 @ $16.00
Local Coke Foundry, No. 1...	13.50 @ 14.00
Local Coke Foundry, No. 2...	13.00 @ 13.25
Local Coke Foundry, No. 3...	12.75 @ 13.00

In Southern markets there is no improvement in the Pig-Iron trade, and the existing monetary depression seems to bear with greater weight upon the business with each succeeding week. Consumers of Pig Iron who are undoubtedly solvent cannot pay their paper as it becomes due, and must be accommodated by renewing it. There is much talk of the suspension of production of Pig Iron until more favorable times, but this matter is uncertain. While the melting of Iron is much restricted in this district, there is yet a considerable volume of business, but the purchases are mainly in single carloads. Quotations are as follows:

Foundry.

Southern Coke, No. 1.	$13.00 @ $13.25
Southern Coke, No. 2.....	11.50 @ 11.75
Southern Coke, No. 3.....	11.00 @ 11.25
Ohio Soft Stone Coal, No. 1....	16.00 @ 16.25
Ohio Soft Stone Coal, No. 2....	15.00 @ 15.25
Lake Superior Coke No. 1.....	15.00 @ 15.25
Lake Superior Coke No. 2.....	14.00 @ 14.25
Hanging Rock Charcoal, No. 1..	18.50 @ 19.00
Hanging Rock Charcoal, No. 2..	17.50 @ 18.00
Tennessee and Alabama Charcoal, No. 1.....	15.00 @ 15.50
Tennessee and Alabama Charcoal, No. 2.....	14.00 @ 14.50

Metal Market.

Pig Tin.—The sharp decline in price of Silver, along with financial complications, has caused depression in the market, under the weight of which values dropped about ½¢ @ ⅝¢ ₱ lb from the closing quotations at the date of last week's review. Business has been done during the week at as low as 19 45¢ for spot and July delivery, and sales were difficult to make at that price at the close.

Copper.—Business has been on a very moderate scale and the popular quotation for Lake Superior Ingot is 10¾¢, but some sales have been made at less, and there were faint signs that bids of 10½¢, prompt cash, would have found takers in some quarters. Electrolytic sold at 10¼¢ @ 10½¢, according to brand and size of lot. On Casting Copper there has been a decline to 9¾¢ @ 10¢, but the inside price seems to be exceptionally low at the moment.

Pig Lead—Under the pressure of liberal offering of stock for delivery during the next 60 days, prices have undergone a further decline and the market is at present suffering in no uncertain way from the weight of financial stringency. The official bullion price dropped to 3.40¢, the lowest point that has been touched in a long time.

Spelter.—Dullness is still the prominent feature in the market for this metal. Prices are rather weak, with the range of 4.15¢ @ 4.25¢ quoted for Prime Western delivered here.

Antimony.—The market has been very slow, but prices are held at about 9⅞¢ for Hallett's, 10⅛¢ @ 10¼¢ for L X, and 10½¢ for Cookson's.

Tin Plate.—There is no change in the condition of the market; certainly none for the better as far as sales or demand are concerned. Aside from occasional lots of special sizes the purchases for future delivery are still extremely slim and spot goods are taken in very moderate quantities. Prices are rather weak all along the line but show no radical change.

Chicago Report.

Scrap.—There is so little demand from consumers for anything except Cast Scrap that dealers hesitate to make offers. They would probably buy at about the following rates:

	Per net ton.	Per lb
No. 1 Wrought Scrap.....	$10.00	....
Machinery Cast.....	7.50	....
Malleable Cast.....	7.00	....
Stove Plate (free of burnt)..	5.00	....
Burnt Iron and Grate Bars..	4.00	....
Sheet Iron and Hoops.. .	3.00	....
Plow Steel and Breaking Stock.....	6 00	....
No. 2, such as Shovels, Hoes, &c.....	4.50	....
Old Boilers—whole (Iron)....	6.00	....
" (Iron)—cut in single Sheets and Rings..	9.00	....
Old Gas-Pipe and Boiler Tubes.....	6 00	....
Cast Borings.....	3 50	....
Turnings.....	5.00	....
Horseshoes.....	10 00	....
Copper Bottoms.....	....	7 ¢
Copper Clips and Heavy.....	. ..	8½¢
Heavy Brass.....	....	7½¢
Light Brass.....	....	4 ¢

Pipe Lead	8 ¢
Tea Lead	21½¢
Zinc	2¾¢
Rubber	2¾¢

Anthracite.—The summer buying has not yet begun. Dealers quote carload lots of 12 net tons as follows:

	Grate.	Egg, Sto. and Ch.
Chicago, Ill	$5.85	$6.10
Milwaukee, Wis	5.85	6.10
Kansas City, Mo	9.05	9.30
Council Bluffs, Iowa	9.05	9.30
Lincoln, Neb	9.20	9.45
Sioux City, Iowa	9.05	9.30
Aberdeen, S. Dak	9.10	9.35
Dubuque, Iowa	7.15	7.40
Madison, Wis	7.35	7.60
St. Paul, Minn	8.35	8.60
Burlington, Iowa	7.35	7.60
Des Moines, Iowa	8.80	9.05
Davenport, Iowa	7.15	7.40
St. Joseph, Mo	9.05	9.30
Leavenworth, Kan	9.05	9.30
Omaha, Neb	9.05	9 30

Colorado Anthracite.

COLORADO FUEL & IRON COMPANY.

Denver	$8.00
Pueblo	8.00
Colorado Springs	8.00
Leadville	8.00
Cheyenne, Wyo	10.00
All points between Denver and Missouri River	9.35

CONDITION OF THE

Hardware Trade.

WITH THE CLOSE of the half year there is naturally a diminished volume of business, and, taken all in all, trade is quiet, orders being limited for the most part to small assortments of goods which are needed for early requirements. Many manufacturers are preparing for the dullness which generally prevails in July and are giving their attention to repairs and the finishing up of the six months' business. The financial situation has a good deal of influence with the larger buyers, and there is a marked indisposition on their part to make any large purchases, preferring to await developments rather than take advantage of the low prices which are prevailing in many lines. The stringency in the money market is being felt by wholesale houses and manufacturers, and it is observed that some strong concerns are not availing themselves of the usual cash discounts. At the present time more attention is being given to the scrutinizing of credits and the collection of accounts than to efforts for the sale of goods. In the matter of prices there is very little to report, the market continuing weak and in an unsatisfactory condition, but manufacturers are refraining from pushing goods upon their customers, thus preventing any material shrinkage in quotations. The volume of business during the half year has probably been nearly, if not quite, up to the average, the quiet which has prevailed during the past month or two being counterbalanced by the excellent trade with which the year opened. The indications are that July will be a quiet month, but it is hoped that with the removal of financial uncertainty and disquietude there will be a satisfactory resumption of business in good volume before long.

Advices from Chicago.—Trade in Shelf Hardware is somewhat lighter now, as summer is here, and the demand for seasonable goods is about over, except for pick-up orders to supply the scattering trade. Vacations are beginning and salesmen are taking advantage of the approaching summer dullness to visit the World's Fair. The demand for Builders' Hardware continues light, as was reported last week. Staple goods are comparatively quiet also. The trade in Heavy Hardware is very moderate for the time of the year, although some houses report a fair condition of business, greater in volume than they had reason to expect from existing conditions.

Notes on Prices.

Cut Nails.—There is only a moderate demand for Cut Nails, and prices are somewhat irregular. The quotation of $1.05 for carload lots at mill represents the market in a general way, being shaded on desirable orders. Small lots from store in New York are held at $1.30 to $1.35.

Advices from Chicago.—Manufacturers of Cut Steel Nails report an absence of large orders, but a steady influx of small orders, which keeps them moderately busy. There are no special developments in this line, but prices are held at $1.20 to $1.25, Chicago, on factory lots, and $1.30 on small lots from stock.

Wire Nails.—There has been no important change in the Wire Nail market. The mills are preparing for the shutdown in July, which will be quite general, and in anticipation of this some of the trade are sending in orders covering their requirements for that month. The aggregate of this business is not referred to as especially large, a good many of the trade having sufficient stocks on hand. The quotation of $1.35 for carload lots at mill still prevails and is maintained with a good deal of regularity, manufacturers refraining from making important concessions. The feasibility of reaching an understanding in regard to prices and production is still under consideration by the manufacturers and it is thought that the present condition of things is favorable for the success of the project. There are, however, serious difficulties in the way and what the outcome will be is uncertain.

Advices from Chicago.—The Wire-Nail trade is in a little better condition from the manufacturers' standpoint. Less pressure to sell is observable, and although prices have not been sustained at the figures named last week by sanguine sellers, a firm bottom appears to have been reached, and there is now a chance for a better condition of trade after the general shut down takes place the coming month. Quotations on factory range according to the mill, from $1.40 to $1.50, Chicago. Jobbers quote $1.60 as their regular price from stock, with concessions to best buyers.

Barb Wire.—The Barb-Wire market continues sluggish, with the moderate volume of trade prices continue unchanged at $2.45 to $2.50 for Four-Point Galvanized in carload lots at mill.

Advices from Chicago.—Orders are still coming in reasonably well for fair quantities from factory. World's Fair visitors are buying, also, to some extent. Local manufacturers have thus been favored recently with considerable Southwestern trade. Taking the whole volume of business, however, it is lighter than it was and seems to be tapering down to the usual midsummer dullness. Carload lots are quoted at $2.15 for Painted and $2.55 for Galvanized. Small lots are selling at $2.30 and $2.70, respectively.

Tackle Blocks.—The Tackle Block market continues in the demoralized condition which has prevailed for some time. It is conceded by manufacturers that the goods are selling below the cost of production, but the competition has been and continues very animated. The volume of business has been fair, but at present it is referred to as having fallen off considerably. The trade will realize how unsatisfactory the present condition is to the manufacturers when it is remembered that before the combination broke up prices were represented by a discount of 50 and 10 and 10 per cent., but that recently sales have been effected in some extreme cases at prices as low as discount 85 per cent., which represents a shrinkage in price to 15 cents as compared with 40 cents. This condition of things had doubtless something to do with the embarrassment of the Boston & Lockport Block Company, the effect of which on the market remains to be seen. It is thought not unlikely that it may have a tendency to diminish somewhat the prevailing competition and induce manufacturers to pursue a more conservative course.

Glass.—This is a season of the year when little is being done in the way of distributing Glass from factories. It is too late for jobbers to place large orders, and too early to make contracts for fall delivery. The disposition is to purchase enough only to cover immediate wants, this policy being largely enforced by the scarcity of money. Most of the factories have shut down for the summer, and, it is understood, with comparatively small stocks of Glass on hand. The National Window Glass Company have succeeded in maintaining prices, apparently under the most adverse circumstances, as in all probability the backward spring and, later, the financial uncertainty would have demoralized prices completely, if the manufacturers and jobbers had not been held in check. As it is, the outlook for good prices and better trade in the fall is encouraging. Small dealers are replenishing their stocks from jobbers, day by day, so that the Glass

handled in small quantities amounts to quite an aggregate. There are no encouraging features in the Plate-Glass market, demand continuing limited. Jobbers do not appear to be overstocked, as a rule, but the factories have as much Glass as they can conveniently carry. Quoted prices remain unchanged, as follows: American Window Glass, 2000 boxes at one time, 80 and 10 and 10 per cent. discount; carloads, 400 boxes, 80 and 15 per cent. discount; less quantities than carloads, 80 and 10 per cent. discount. Freight allowed on car lots and over, not to exceed 17½ cents per 100 pounds; less than car lots, f.o.b. at shipping point. French Window Glass, 75 and 10 and 5 per cent. discount. American Plate ranges in price from 50 and 10 and 7½ per cent. discount to 60 and 5 per cent. discount. Imported Plate Glass, 60 per cent. discount to 60 and 10 and 5 per cent. discount.

Old Rubber.—The following are the current prices paid for Old Rubber delivered in New York:

Car Springs, ton lots,	₩ lb.	@	$0.03½
Rubber Shoes, ton lots	₩ lb.	@	.04
Large Hose,	₩ ton	@	9.00
Wringer Rolls,	₩ lb	@	.04½
Wringer Wire Rolls,	₩ lb.	@	.02
Syringes,	₩ lb	@	.05

Old Rags, Paper, Etc.—The following are the current prices paid for Old Rags, Paper, &c., delivered in New York:

No. 1 White Rags	₩ lb		4¢
No. 2 White Rags	₩ lb		3¢
Mixed Rags	₩ lb	1⅛ @	1¾
Blues and 3ds	₩ lb	1¾ @	2
Hard Sized White Shavings	₩ lb	2¾ @	3 ¢
No. 1 White Book Shavings	₩ lb	2¼ @	2⅜¢
No. 2 White Book Shavings	₩ lb	1½ @	1¾¢
Light Book Shavings	₩ lb	⅞ @	1 ¢
No. 1 Mixed Shavings	₩ lb		1¼¢
No. 2 Mixed Shavings	₩ lb	¾ @	⅞¢
No. 1 Printed Books	₩ lb	1⅜ @	1½¢
Ordinary Mixed Books	₩ lb	¾ @	⅞¢
Newspapers	₩ lb		½¢
No. 1 Manila Paper	₩ lb	1⅛ @	1¼¢
No. 2 Manila Paper	₩ lb	⅛ @	1 ¢
Bogus Paper	₩ lb	⅝ @	¾¢
Common Paper	₩ lb	¾ @	½¢
Straw Chips	₩ lb	½ @	⅝¢
Binders' Clippings	₩ lb	½ @	⅝¢
Jute Butts	₩ lb		1¼¢
No. 1 Jute Bagging	₩ lb	1¼ @	1⅜¢

Old Metals.—The following are the current prices paid for Old Metals in New York:

Heavy Copper	₩ lb	9½¢
Light and Tinned Copper	₩ lb	8½¢
Heavy Brass	₩ lb	7¢
Light Brass	₩ lb	6¢
Lead	₩ lb	3½¢
Tea Lead	₩ lb	3¼¢
Zinc	₩ lb	2¾¢
No. 1 Pewter	₩ lb	14¢
No. 2 Pewter	₩ lb	7¢
Wrought Scrap Iron	₩ gross ton,	$13.00
Heavy Cast Scrap	₩ gross ton,	9.00
Stove Plate Scrap	₩ gross ton,	6.00
Burnt Iron	₩ gross ton,	4.00
Mixed Bagging	₩ lb	1 ¢
No. 2 Bagging	₩ lb	¾¢
Hemp Twine	₩ lb	2½¢
Manila Rope	₩ lb	2¼¢
Jute Rope	₩ lb	1⅞ @ 2 ¢
Mixed Rope	₩ lb	¾ @ ⅞¢

In an article on "Southern Progress and Prospects," J. S. Jeans, secretary of the British Iron Trade Association, says it will not excite any great surprise if in the not far distant future coal from the Southern States should be shipped to ports now supplied by England, and even to England herself.

Trade Notes.

THOS. DEVLIN & Co. of Philadelphia have just completed a handsome addition to their establishment. The new building is six stories high, 140 feet long by 40 feet wide, and will considerably increase their facilities for turning out goods, and enable them to keep well up with the increase in their trade connections.

ESTATE OF S. WHITNUM, Brooklyn, galvanizers (Edward Little, manager), have recently added a one-story extension to their works, which now cover a plot 150 feet on Driggs avenue and 200 feet on North Eleventh street. They are now engaged in galvanizing a large order recently received from the Third Avenue Railroad Company. Castings weighing over 40 tons have been received to be galvanized. Among them are the caps for the immense chimney connected with the power house. They are also engaged on a large order for galvanizing 24,000 kitchen sinks, to be finished within 60 days. A number of men have been recently added to their force, making 125 men in all. Mr. Little, the manager, is a well-known business man, and is the patentee of many well-known articles, among them being a corrugated leader and a stand for kitchen boilers.

JOHN B. HARKER & Co., 19 Fifth street, South, Minneapolis, Minn., state that the suit instituted against them 16 months since for the infringement of a patent on a Waffle Iron has been decided in their favor. The decision was a most decided refutation of the claim made against them, and they are now free to push the manufacture and sale of the Harker Waffle Iron.

Enlargement of Cramp's Shipyard.

Mayor Stuart of Philadelphia has signed an ordinance by which the long-desired facilities are given for extending Cramp's shipyard, so as to accommodate the large amount of work now on the books of that establishment. The Cramp Company will, it is said, now proceed with the construction of five great slips, over 600 feet long and 70 feet wide, which will be required for the five large American liners under contract. When all the enlargements and improvements which have been decided upon are carried into effect, Philadelphia will possess a shipbuilding plant the peer of any in the world, giving employment to a larger number of skilled mechanics and workingmen than any single industrial establishment in the Quaker City. At present there are 4500 men on the pay rolls, but 6000 will be required to run the plant on the increased scale contemplated. Cramps have now in hand seven war vessels for the Government—namely, the armored cruiser "New York," now nearing completion; the commerce destroyers "Minneapolis" and "Columbia;" battle ships "Indiana," "Massachusetts" and "Iowa," and the armored cruiser "Brooklyn." Besides these, work will shortly be commenced on the five ocean greyhounds to be built for the American line—namely, two of 10,500 tons and 540 feet long, and three of 13,000 tons, 600 feet in length. All other departments of the establishment are reported as very actively employed, the gun shops being filled with orders for the next nine months, and the brass foundry for another year.

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Metal and Miscellaneous Prices.

See Standard Lists on Following Pages.

CHICAGO, JUNE 29, 1893.

Tin—

Straits pigs..... 22¢

Imported Tin Plates—

Charcoal Plates.—Bright.

Guaranteed Plates command special prices, according to quality.

		Per box.
Calland'and Melyn Grade	IC, 10 x 14	@ $6.75
	IC, 12 x 12	@ 6.75
	IC, 14 x 20	@ 6.75
	IC, 20 x 28	@ 13.50
	IX, 10 x 14	@ 8.75
	IX, 12 x 12	@ 8.75
	IX, 14 x 20	@ 8.75
	IX, 20 x 28	@ 17.50
	DC, 12½ x 17	@ 6.50
	DX, 12½ x 17	@ 8.50
Allaway Grade	IC, 10 x 14	@ 6.50
"	IC, 12 x 12	@ 6.50
"	IC, 14 x 20	@ 6.50
"	IC, 20 x 28	@ 13.00
"	IX, 14 x 20	@ 8.00
"	IX, 20 x 28	@ 16.00

Coke Plates—Bright.

	Per box.
Steel Coke—IC, 10x14, 14x20	@ $6.00
IC, 14x20, 90 lb	@ 5.75
IC, 14x20, 100 lb	@ 5.85
10 x 20	@ 9.00
20 x 28	@ 12.00
X, 10x14, 14x20	@ 7.50
Grade. IC, 10x14, 14x20	@ 6.00

Charcoal Plates.—Terne.

Guaranteed Plates command special prices, according to quality.

Mansel and Dean Grades.—

IC, 14 x 20 ...@ $5.62½
20 x 28.....@ 11.25
IX, 20 x 28.....@ 14.25

Worcester Brand and equal.—

IC, 14 x 20.. 6.12½@ .....
IC, 20 x 28..12.25 @ .....
IX, 14 x 20.. 7.62½@ .....
20 x 28..15.25 @ .....

American Tin Plates.

Charcoal Plates.—Bright.

Irondale, A. A.—IC, 14 x 20.....$7.00
" " IX, 14 x 20..... 9.00
" " IXX, 14 x 20.....11.00
" " IC, 20 x 28..... 14.00
" " IX, 20 x 28.....18.00
" " IXX, 20 x 28.....22 00

Florence.—

IC, 10 x 14, 12 x 12, 14 x 20..$6.75
IX, 10 x 14, 12 x 12, 14 x 20.. 8.75

Palma.—

IC, 10 x 14, 12 x 12, 14 x 20..$7.50
IX, 10 x 14, 12 x 12, 14 x 20.. 9.50

Each extra cross $2.00 and 20 x 28 double these prices.

Brilliant, Tissue Packed, IC, 14 x 20.$9.25
Royal, extra, IC, 14 x 20..... 7.25
Merion, IC, 14 x 20..... 7.00
Almond, IC, 14 x 20..... 6.50
Mint, IC, 14 x 20..... 6.25

Coke Plates.—Bright.

Elwood.—IC, 14 x 20.....$6.00
" IC, 20 x 28.....12.50

Roofing Plates.

Arch (205 lb), 20 x 28	@ $12.00
Palm (205 lb), 20 x 28	@ 12.25
Crescent, IC, 20 x 28	@ 12.50
Crescent, IX, 20 x 28	@ 15.75
Empire, IC, 20 x 28	@ 12 75
" IX, 20 x 28	@ 16.00
Hickory, IC, 20 x 28	@ 13.00
" IX, 20 x 28	@ 16.10
Alaska (heavily coated), IC, 20x28	@ $14.50
Alaska IX, 20 x 28	@ 17.75
Special, IC, 20 x 28	@ 15.00
" IX, 20 x 28	@ 18.25
Merchant's Roofing (extra coated), IC, 20 x 28	@ $17.75
Merchant's Roofing (extra coated), IX, 20 x 28	@ $21.50
Merchant's Old Method, (extra heavily coated), IC, 20 x 28	@ $19.75
Merchant's Old Method (extra heavily coated), IX, 20 x 28	$23.60
Irondale A:	
IC, 14 x 20	$6.25
IX, 14 x 20	7.75
IC, 20 x 28	12.50
IX, 20 x 28	15.50
Westmoreland:	
IC, 14 x 20	$6.25
IC, 20 x 28	12.50
Elwood:	
IC, 20 x 28	$12.00
Juno:	
IC, 14 x 20	$5.75
IC, 20 x 28	11.50
Scott's Extra Coated, Stamped and Resquared, IC, 14 x 20	$9.50
Scott's Extra Coated, Stamped and Resquared, IX, 14 x 20	11.00
Scott's Extra Coated, Stamped and Resquared, IC, 20 x 28	19.00
Scott's Extra Coated, Stamped and Resquared, IX, 20 x 28	22.00
Neville, Stamped, IC, 14 x 20	6.25
" " IX, 14 x 20	7.50
" " IC, 20 x 28	12.50
" " IX, 20 x 28	15.00
Taylor's Old Style, IC, 14 x 20 (Stamped and Resquared)	$9.50
Taylor's Old Style, IC, 20 x 28 (Stamped and Resquared)	19.00
Taylor's Roofing, IC, 14 x 20 (Stamped and Resquared)	8.25
Taylor's Roofing, IC, 20 x 28 (Stamped and Resquared)	16.50
Columbia, IC, 14 x 20 (Stamped)	7.25
" IC, 20 x 28 (Stamped)	14.50
Maple, IC, 14 x 20 (Stamped)	6.75
" IC, 20 x 28 (Stamped)	13.50
Willow, IC, 14 x 20	6.50
" IC, 20 x 28	13.00
Knoxall, IC, 14 x 20	6.25
" IC, 20 x 28	12.50
Globe, IC, 14 x 20	6.00
" IC, 20 x 28	12.00
Miami, IC, 14 x 20	6.00
" IC, 20 x 28	12.00
" IX, 20 x 28	15.00
" (Redipped), IC, 20 x 28	17.00

Tin Boiler Plates.

	Per box of 100 sheets.	Per box of 112 sheets.
X, 14 x 28	$13.00	$13.00
XX, 14 x 28	14.50	14.50
X, 14 x 31	14.50	15.80
XX, 14 x 31	16.50	17.50
X, 14 x 56	29.50	16.50
XX, 14 x 56	32.50	18.20
X, 14 x 60	31.50	17.65
XX, 14 x 60	35.50	20.90

Sheet Iron—

Black.

	Common American	Refined.
Nos. 10 to 16	₩ lb 2 7-10¢	3 3-10¢
17 to 20	₩ lb 2 8-10¢	3 4-10¢
21 to 24	₩ lb 2 9-10¢	3½¢
25 and 26	₩ lb 3¢	3 6-10¢
27	₩ lb 3 1-10¢	3 7-10¢

Russia, Planished, &c.

Genuine Russia, all numbers....13¢ net.
Patent Planished....₩ lb A, 10½¢; B, 9½¢
dis. 5%

Galvanized.

List on following page.
Juniata or first quality.....dis. 70&2½%

Copper—

Ingot.

Lake.....12¢ @ 12½¢
Casting Brands.....11¢ @ 11½¢

Sheet and Bolt.

List on following page. Discount to retailers, 25%.

Copper Bottoms.

List on following page. 25%.

Seamless Brass and Copper Tubes.

Base price, 17½¢, Chicago, with extras according to size.

Copper, Bronze and Gilding Tube, 3¢ ₩ lb additional.

Brazed Brass Tubing.

(To No. 20 inclusive.)

Add freight from New York to Chicago to these prices, or 50¢ ₩ 100 lb.

Above 5 16 inch to 3 inch inclu	35¢
Plain, above 3 inch	45¢
Plain, 5-16 inch	45¢
Plain, ¼ inch	60¢
Plain, 3-16 inch	$1.00
Plain, ⅛ inch	$1.50
Fancy Tubing, Brass, to No. 20 inch	43¢ lb
Bronze Tubing, 3¢ ₩ lb more than Brass	

35 @ 40%

Roll and Sheet Brass.

List on following pages. 35 @ 40%.

Slab Spelter—

Western Spelter.....5

Sheet Zinc—

600 lb casks.....6¼¢
Less than Casks, ₩ lb.....6½¢

Lead—

Soft Pig Lead.....4½¢
Bar.....4.60¢@5¢
Pipe.....5½¢, dis. 10¢
Block Tin Pipe.....35¢
Sheet.....6¢, dis. 10%

Solder—

½&½.....13¼¢@13½¢
Extra Wiping.....12¢

The prices of the many other qualities of Solder in the market indicated by private brands vary according to composition.

Antimony—

Cookson.....12½¢@13½¢
Hallett's.....11½¢@12½¢

Wire—See *Hardware.*

Wrought-Iron Pipe—

List on following page.

1¼ and under, Galv.	60&10%
1¼ and under, Galv.	52½&10%
1½ and over, Plain	70&10%
1½ and over, Galv.	60&10%
Boiler Tubes, list Oct. 24, 1892	65@67½%
Casing, list Nov. 16, 1892	52½%
Inserted Joints Casing, list Nov. 16, 1892	47½%
Steel Boiler Tubes	27½%
Cold Drawn Seamless Steel Tubing	50%

Cast-Iron Soil Pipe—

Cast-Iron Soil-Pipe, Tarred; sizes 2 to 6 inches, inclusive.....dis 70&2½%
Other sizes.....dis 60%

Leader Pipes—

Abendroth's Galv. Spiral Riveted	55%
Austin's Corrugated	60%
Gordon & Gilbert's Corrugated	55%
Ritchie's (Galv. Iron only) Cor'd	55%
Ritchie's Spiral Lock Seam, Galv'd	50%
Austin's Spiral Ribbed Pipe	55%
Plain Adjustable Elbows	55%
James A. Miller Bros. (Galv'd Iron only) Corrugated	55%

Furnace Fittings—

Discount from Excelsior Steel Furnace Co.'s list.....50%

Steel Roofing—

Perfection	$3.75 square
Climax	$3.50 square
The Lloyd Spanish Tiling	$4.50 square

Metallic Shingles—

Cushman's.....$1.25 square
Merchant & Co.'s Spanish Tiles:
Copper, 14 oz. .....$36.00 square
Steel, painted.....$9.00 square

Drain Pipe—

Discount from list.....50%

Paints, Oils, &c.—

Deodorized Benzine	7½@8 ¢
Iron Paint, Bright Red	₩ lb, 2 ¢
" " Brown	₩ lb, 1½¢
" " Purple	₩ lb, 2½¢
" Ground in oil, B. Red	₩ lb, 6½¢
" Ground in oil, Red	₩ lb, 6½¢
" Ground in oil, Brown	₩ lb, 6½¢
" Ground in oil, Purple	₩ lb, 6 ¢
Linseed Oil, Boiled, in bbls	53¢
Linseed Oil, Raw, in bbls	50¢
Mineral Paints	2@4¢
Orange Mineral	10%¢
Pure White Lead in Oil	6¾@7¾¢
Dry White Lead in bbls	6¼@6¾¢
Red Lead, American	7@7½¢
Red Venetian, English, dry	$1.65@$1.70
Red Venetian in oil; asst'd cans, 8½¢; kegs	7½¢
Sipe's Japan Oil, in bbls, ₩ gal.	31¢
Spirits Turpentine, in bbls., ₩ gal.	34½¢
Asphaltum, Trinidad Refined, ₩ ton.	$15
Tarred Felt, 1 Ply, ₩ 100 lb	$1.65
Tarred Felt, 2 Ply, ₩ roll 108 sq. feet	$1.50
Tarred Felt, 3 Ply, ₩ roll of 108 sq. feet	$2.00
Roofing Pitch, lb bbl. of 300 lb	$3.20

NEW YORK, JUNE 30, 1893.

Aluminum—

No. 2 Grade Metal, in ton lots..₩ lb, $0.75
No 1 (guaranteed to be 98 % pure and over), in ton lots .....₩ lb .90
Lots less than 1 ton, 10¢ ₩ lb additional.

Antimony—

Cookson .....₩ lb, 11½¢
Hallett's.....₩ lb, 10¾@11¢

Brass—

Planished .....net
Roll and Sheet.....35@40%

Brass and Copper Tubes Brazed Brass Tubing—

List May 20, 1889.

	Per lb.
Plain, to No. 20 inclusive, above 5-16 inch to 3 inch inclusive	$0.35
Plain, to No. 20, above 3 inch	45
Plain, 5-16 inch to No. 20	45
Plain, ¼ inch	60
Plain, 3-16 inch	1.00
Plain, ⅛ inch	1.50
Fancy Tubing to No. 20, inclu	43

35@40%

Copper and Bronze Tubing—

3¢ ₩ lb more than brass.

Bronze, Tobin—

Drawn Rods for Bolts, Forgings, &c

Over ¼ to 3½ inches inclusive....17¢ ₩ lb
Over 3½ to 5 inches inclusive.....18¢ ₩ lb

Piston Rods, Finished True, Smooth and Straight.

Over ¼ to 3½ inches inclusive....18¢ ₩ lb
Over 3½ to 5 inches inclusive.....19¢ ₩ lb

Clips—

Buffalo Damper: Nos. 1, $1.25; 2, $2.50 per doz.....40&10%

Conductors—

Corrugated. *Round or Square—*

Galvanized.....60%
Galvanized, Locked Joints.....60%
Tin.....60%

Spiral Riveted—

Galvanized.....50%

See also *Elbows and Shoes; Eave-Trough Miters; Strainers, Conductor.*

Conductor Strainers—See *Strainers, Conductor.*

Copper—

Bottoms, Pits and Flats.....15@25%

Ingot.

Lake.....12¢
Ansonia Grade Arizona.....11¾¢
Ansonia Grade Casting.....11¢

Planished.....net

Sheet and Bolt.....25@30%

Tubes—See *Seamless Brass Tubes.*

Coppers, Soldering—

See *Irons, Soldering*, in Current Hardware Prices.

Damper Clips Buffalo—

See Clips, Buffalo Damper.

Eave Troughs—

Lap or Slip Joint, Galvanized.....60%
Lap or Slip Joint, Terne.....50%

Eave-Trough Mitres—

Lap or Slip Joint.....list, net

Elbows—

Plain Adjustable—

Tin.....70%
Galvanized.....70%

Crimped Tubing—

Re-Tinned or Galvanized.....35%

Stove-Pipe—

Buffalo Four-Piece.

4½	5	5½	6	7 inch,
$0.78	.87	.90	.89	1.20 per doz..20 %

Elbows and Shoes—

Flat Crimp.

Tin.....35%
Galvanized 35%

Corrugated. *Flat Crimp.*

Galvanized.....60%

Round or Square.

Tin.....60%
Galvanized.....60%

Iron, Sheet—

Black.

	Common American.	R. G. Cleaned American.
Nos. 10 to 16	₩ lb, 2¾@....	3¼¢
Nos. 17 to 20	₩ lb, 3 @...	3¼¢
Nos. 21 to 24	₩ lb, 3¼@....	3¼¢
Nos. 25 and 26	₩ lb, 3⅜@....	3⅝¢
No. 27	₩ lb, 3⅝@....	3¾¢
No. 28	₩ lb, 3⅝@....	3¾¢
American B. B.	₩ lb, 4¢@4½¢	

Russia, Planished, &c.

Genuine Russia, according to assortment.....₩ lb, 12@13¢
Patent Planished....₩ lb, A, 10¢; B, 9¢, 5%
Craig Polished Sheet.....₩ lb, 8½¢

Galvanized.

	B. B.
Nos. 10 to 16	₩ lb, 4¢
Nos. 17 to 22	₩ lb, 4¼¢
Nos. 23 to 24	₩ lb, 4½¢
Nos. 25 to 26	₩ lb, 4¾¢
No. 27	₩ lb, 5¢
No. 28	₩ lb, 5¼¢
Nos. 29 and 30	₩ lb, 6¼¢

Filter Joints—

Lee's.....33⅓%

Lead—

American Pig.....4¾¢
Bar.....4¾¢

New York Prices.

Pipe.....6¼¢, 20%
Tin Lined Pipe.....15¢, 20%
Block Tin Pipe.....37½¢, 20%
Sheet.....7¢, 20%
Old Lead in exchange, 3½¢ ₩ lb.

Pittsburgh Prices.

Lead Pipe in whole coils. ₩ lb, .05¢, 10&5%
Sheet Lead in whole coils. ₩ lb, .05½¢, 10&5%

Metal, Expanded—

Manufacturers' list No. 5.

Lathing	10%
Fencing, Painted Sheets	20%
Netting, Painted Sheets	20%
Door Mats, Galvanized	25%
Window Guards, Paneled	15%
Tree Guards, Paneled	15%

Mitres Eave-Trough—See *Eave-Trough Mitres.*

Paints Oils &c.—

Lead, Amn. White, Dry or in oil:

Kegs, lots less than 500 lb	7 @ 7¼
Kegs, lots 500 lb to 5 tons	6½ @ 6¾
Kegs, lots 5 tons to 12 tons	6¾ @ 6⅞
Kegs, lots 12 tons and over	6¼ @ 6½
Lead, White, in oil, 25 lb tin pails, add to keg price	... @ ¼
Lead, White, in oil, 12½ lb tin pails, add to keg price	... @ 1
Lead, Red, bbls. and ½ bbls	6 @ 7
Lead, Red, kegs	6¼ @ 7¼
Ocher, American	½ @ 1½
Red, Venetian, American ₩ 100 lb	1.00 @ 1.10

Linseed Oil:

City, raw, ₩ gal.	.. @ .50
City, boiled	.. @ .53
Western, raw	.. @ .50

Spirits Turpentine:

In regular bbls	28½ @ . 29
In machine bbls	29 @ .29½

Putty:

In barrels and ½ bbls	.013⅜ @ .01⅜
In tubs	.015⅜ @ .01⅜
In tin cans	.01⅜ @ .02½
In bladders	.01⅜ @ .02½

Roofing Material, &c.:

Asphaltum, Trinidad Refined, ₩ ton.	$30.00@$35.00
Asphaltum, Rock, ₩ ton	$14.00
Coal Tar Felt, 1 Ply, ₩ lb	2¢
Coal Tar Felt, 2 Ply, ₩ roll 108 sq. ft.	$1.42½
Coal Tar Felt, 3 Ply, ₩ roll 108 sq. ft.	$1.85
Roofing Pitch, ₩ bbl.	$2.24

Pipe, Drain 50%

Pipe and Fittings, Cast Iron Soil—

Cast-Iron Soil Pipe, Tarred, sizes 2 to 6 Inches, inclusive	60@60&10%
Other sizes	55@55&10%
Cast-Iron Fittings, Tarred, sizes 2 to 6 inches	60@60&10%
Other sizes	55@55&10%

Pipe, Spiral—

Galvanized.....60%
Tin.....60%

Pipe, Wrought Iron—

For discounts see Current Hardware Prices.

Polish, Stove—

Raven Liquid:

6 oz. bottles, ₩ gro	$8.00
8 oz. bottles, ₩ gro	$9.00
Water Polish	$7.20

Rivets and Burrs—

For discounts see Current Hardware Prices.

Rock and Slag Wool—

	₱ lb.	₱ cub. foot.
Slag Wool, ordinary	1¼	19¢
Slag Wool, extra	2½	38½¢
Rock Wool, ordinary	2¾	27¢
Rock Wool, extra	7¼	43½¢

Rosin—

Common and Good—Strained,	
Rosin, C. & D.	₱ bbl. $1.22@$1.30
Rosin, E. & F.	₱ bbl. $1.40@$1.50
Rosin, G. & H.	₱ bbl. $1.55@$2.10
Rosin, I. & K.	₱ bbl. $2.70@$3.50
Rosin, M. & N.	₱ bbl. $3.80@$3.90

Seamless Brass Tubes..net

Shoes and Elbows—See *Elbows and Shoes.*

Slate Roofing—

According to size, f.o.b. cars, Quarry Station.

Pennsylvania:	
Best Bangor, ₱ sqr.	$3.25@$4.50
Pen Argyle, ₱ sqr.	3.50@ 4.25
Peach Bottom, ₱ sqr.	5.00@ 6.25
No. 1 Chapman, ₱ sqr.	4.00@ 4.65
Lehigh Slates, ₱ sqr.	3.00@ 4.50
Vermont:	
Sea Green, ₱ sqr.	2.70@ 3.20
Purple, ₱ sqr.	3.50@ 4.50
Unfading Green, ₱ sqr.	3.50@ 4.00
Red, ₱ sqr.	9.75@12.00

Solder and Soldering Fluids—

Solder—

½ & ½ (Guaranteed)	13½@15¢
No. 1	11¾@12½¢

Prices of Solder indicated by private brands vary according to composition.

Soldering Fluids—

Concentrated Soldering Flux.

f.o.b. New York.

In barrels, ₱ lb.	4¢
Smaller quantities, ₱ lb.	5¢

Gedney's Soldering Fluid.

In carboys or barrels, ₱ lb.	2¢

$1.50 for ca rboy or barrel; money refunded when returned.

Perfection Soldering Flux.

No charge for package.

Bbls., about 500 lb, ₱ lb.	3½¢
½ bbls., about 300 lb, ₱ lb.	4¢
Kegs, about 110 lb, ₱ lb.	4¢
Kegs, about 55 lb, ₱ lb.	4¢

5% dis.

75¢ extra for keg.

Yager's Soldering Salts.

¼ lb bottles, each	30¢
Large quantities, per lb	40¢

Spelter—

Western Spelter	5¢@5¼¢
Bertha	8@8¼¢

Spiral Pipe—See *Pipe, Spiral.*

Stove-Pipe Elbows—*See Elbows. Stove Pipe.*

Stove Polish—See *Polish, Stove.*

Stove Trucks—See *Trucks, Stove.*

Strainers Conductor—

Galvanized	60%

Tin, Pigs and Bars—

Banca, pigs, ₱ lb.	21¼@22¢
Straits, pigs, ₱ lb.	21½¢
Straits in bars, ₱ lb.	22½¢

Tin Plates—

American Terne Plates—

Apollo Roofing.

IC, 14 x 20	$6.25
IC, 20 x 28	12.50
IX, 14 x 20	7.25
IX, 20 x 28	14.50

Buckeye.

IC, 14 x 20	$7.00
IC, 20 x 28	14.00
IX, 14 x 20	8.25
IX, 20 x 28	16.50
IXX, 14 x 20	9.50
IXX, 20 x 28	19.00

De Mill's.

First New York, IC, 14 x 20	$5.75
" " " IC, 20 x 28	11.50
First New Jersey, IC, 14 x 20	5.75
" " " IC, 20 x 28	11.50
Manhattan, IC, 14 x 20	7.25
" " " IC, 20 x 28	14.50

Dunlap's.

Double Dipped, IC, 14 x 20	$8.25
" " " IC, 20 x 28	16.50
" " " IX, 14 x 20	9.50
" " " IX, 20 x 28	19.00
Domestic, IC, 20 x 28	12.00
" " IX, 20 x 28	15.00

Glendale Tin Plate Co.

Optimus, Best Redipped, IC, 14 x 20	$8.25
" " " IC, 20 x 28	16.50
" " " IX, 14 x 20	9.75
" " " IX, 20 x 28	19.50
N. F., Old Style, IC, 14 x 20	7.50
" " " IC, 20 x 28	15.00
" " " IX, 14 x 20	9.00
" " " IX, 20 x 28	18.00
Bonus, Extra Coated, IC, 14 x 20	6.75
" " " IX, 14 x 20	8.25
" " " IC, 20 x 28	13.50
" " " IX, 20 x 28	16.50

Hamilton's.

Hamilton's Best Redip'd, IC, 14x20	$9.25
" " " IC, 20x28	18.50
" " " IX, 14x20	10.75
" " " IX, 20x28	21.50
Osceola Hand Coated, IC, 14x20	8.25
" " " IC, 20x28	16.50
" " " IX, 14x20	9.75
" " " IX, 20x28	19.50
Lula Best Charcoal, IC, 20x28	12.50
" " " IX, 20x28	16.00

Laufman's.

Apollo, IC (Resquared), 14 x 20	$8.12
Apollo, IX (Resquared), 14 x 20	9.37
Apollo, IC (Resquared), 20 x 28	16.00
Apollo, IX (Resquared), 20 x 28	18.50
Apollo, IC (Resquared), 20 x 56	16.00
Apollo, IX (Resquared), 20 x 56	18.50
Tip Top, IC (Resquared), 14 x 20	6.62
Tip Top, IX (Resquared), 14 x 20	7.88
Tip Top, IC (Resquared), 20 x 28	13.00
Tip Top, IX (Resquared), 20 x 28	15.50
Allegheny, IC, 14 x 20	6.12
Allegheny, IX, 14 x 20	6.38
Allegheny, IC, 20 x 28	12.00
Allegheny, IX, 20 x 28	12.50

Merchant's.—All Stamped.

Crescent, IC, 20 x 28	$12.00
Crescent, IC, 14 x 20	6.00
Hickory, IC, 20 x 28 (Resquared)	12.75
Hickory, IX, 14 x 20 (Resquared)	6.37½
Empire, IC, 20 x 28	12.25
Empire, IC, 14 x 20	6.12½
Alaska, IC, 20 x 28 (Resquared)	14.00
Alaska, IC, 14 x 20 (Resquared)	7.00
Merchant's Roofing, IC, 20 x 28 (Resquared)	17.00
Merchant's Roofing, IC, 14 x 20 (Resquared)	8.50
Merchant's Old Method, IC, 20 x 28 Resquared)	19.00
Merchant's Old Method, IC, 14 x 20 (Resquared)	9.50

Pittsburgh Tin-Plate Works.

Kensington:	
IC, 14 x 20	$6.75
IC, 20 x 28	13.50
IX, 14 x 20	8.00
IX, 20 x 28	16.00
Westmoreland:	
IC, 14 x 20	$6.25
IC, 20 x 28	12.50
Juno:	
IC, 14 x 20	$5.75
IC, 20 x 28	11.50

Scott's.—All Stamped.

Scott's Extra Coated, IC, 14 x 20 (Resquared)	$9.25
Scott's Extra Coated, IX, 14 x 20 (Resquared)	10.75
Scott's Extra Coated, IC, 20 x 28 (Resquared)	18.50
Scott's Extra Coated, IX, 20 x 28 (Resquared)	21.50
Neville, IC, 14 x 20	6.00
" IX, 14 x 20	7.25
" IC, 20 x 28	12.00
" IX, 20 x 28	14.00

N. & G. Taylor Co.'s.

Taylor, Old Style, IC, 14 x 20 (Stamped and Resquared)	$9.25
Taylor Old Style, IC, 20 x 28 (Stamped and Resquared)	18.50
Taylor Roofing, IC, 14 x 20 (Stamped and Resquared)	8.00
Taylor Roofing, IC, 20 x 28 (Stamped and Resquared)	16.00
Columbia, IC, 14 x 20 (Stamped)	7.00
Columbia, IC, 20 x 28 (Stamped)	14.00
Maple, IC, 14 x 20 (Stamped)	6.50
Maple, IC, 20 x 28 (Stamped)	13.00
Willow, IC, 14 x 20	6.25
Willow, IC, 20 x 28	12.50
Knoxall, IC, 14 x 20	6.00
" IC, 20 x 28	12.00
Globe, IC, 14 x 20	5.75
Globe, IC, 20 x 28	11.50

A. A. Thompson & Co.'s.

Old Colony, IC, 14 x 20	$8.00
" IC, 20 x 28	16.00
Thompson's Puritan, IC, 14 x 20	5.75
" IC, 20 x 28	11.50
Durham, IC, 14 x 20	5.75
" IC, 20 x 28	11.50
Central, IC, 14 x 20	5.45
" IC, 20 x 28	10.75
" WC, 14 x 20	5.25
" WC, 20 x 28	10.25
Tarn, IC, 20 x 28	10.50

U. S. Brands.—All Stamped.

U. S. Monongahela, IC, 14 x 20	$6.50
U. S. Redipped, IC, 14 x 20	9.25

20 x 28 double the price of 14 x 20

American Bright Plates—

Merchant's.

Merchant's Dipped, IC, 14x20	$11.00
Palma Xtra, IC, 1-x20	7.25
Florence, IC, 14x20	6.75

N. & G. Taylor Co.'s.

Brilliant, Tissue Packed, IC, 14x20	$9.00
Royal, extra, IC, 14x20	7.00
Merion, IC, 14x20	6.75
Linden, IC, 14x20	6.50
Almond, IC, 14x20	6.25
Mint, IC, 14x20	6.00

U. S.

IC, 14x20	$7.25
IC, 20x28	14.50

Imported Terne Plates—

Charcoal.

Dean Grade.—IC, 14 x 20	@$5.65
20 x 28	@11.00
IX, 14 x 20	@ 6.40
20 x 28	@12.80
Abercarne Grade.—IC, 14 x 20	@ 5.55
20 x 28	@10.80
IX, 14 x 20	@ 6.40
20 x 28	@12.80

Imported Bright Plates—

Charcoal.

Duty: 2.2¢ ₱ lb.

Melyn and Cal- land Grade. IC, 10 x 14	@$6.50
" " IC, 12 x 12	@ 6.75
" " IC, 14 x 20	@ 6.50
" " IC, 20 x 28	@13.00
" " IX, 10 x 14	@ 8.50
" " IX, 12 x 12	@ 8.75
" " IX, 14 x 20	@ 8.50
" " IX, 20 x 28	@17.00
" " DC, 12½ x 17	@ 6.00
" " DX, 12½ x 17	@ 8.00
Allaway Grade. IC, 10 x 14	@ 6.00
" " IC, 12 x 12	@ 6.25
" " IC, 14 x 20	@ 6.00
" " IC, 20 x 28	@12.00
" " IX, 10 x 14	@ 7.50
" " IX, 12 x 12	@ 7.75
" " IX, 14 x 20	@ 7.50
" " IX, 20 x 28	@15.00
" " DC, 12½ x 17	@ 5.50
" " DX, 12½ x 17	@ 7.00

Coke.

Steel Coke.—IC, 10x14, 14x20	$5.40@$5.50
10x20	@ 8.50
20x28	11.50@12.00
IX, 10x14, 14x20	@ 7.00
B. V. Grade.—IC, 10x14, 14x20	@ 5.60

Imported Boiler Plates.—

IXX, 14x26..(112 sheets)	@$13.35
IXX, 14x28..(112 sheets)	@ 14.50
IXX, 14x31..(112 sheets)	@ 16.00

Tinning—

Brass and Copper.....net

Tubing—

Tin	55%
Galvanized	55%

Troughs, Eave—See *Eave Troughs.*

Trucks Stove—

Improved Lock Frame, per doz.	$15.00
Steel Lock Frame, per doz.	18.00

Iron Wire—

See *Hardware Prices.*

Brass and Copper.—

Standard List	30@35%

Zinc—

600 lb casks	6¾¢
Per lb	7¢

Price-Lists, Circulars, &c.

A. I. ROOT, Medina, Ohio: Bees and Honey. This, the seventy-eighth edition of illustrated catalogue and price-list, shows, with descriptions, Implements for bee culture in large variety; also a line of miscellaneous articles.

A. B. KOCH COMPANY, Peoria, Ill.: Circulars descriptive of the Koch Patent Shiftable Reversible Shelf Brackets. These circulars illustrate the methods in which these Brackets can be used in putting up shelving. They are so contrived that the Brackets can easily be shifted to suit goods of different hights. The shelves can readily be removed from one store to another, not being "fixtures" in the ordinary sense.

OSSAWAN MILLS COMPANY, Norwich, Conn.: Twisted, Braided and Woven Goods, in silk, worsted, cotton and wire. Their illustrated catalogue, which is the first showing a complete line of their Cords, Wires and other manufactured goods, states that with machinery the manufacturers are able to make a great variety of Twisted, Braided and Woven Goods on special orders. In addition to the above-named articles, cuts are given of Picture Hooks, Screw Eyes, Screw Hooks, &c.

BOSTON EMERY WHEEL COMPANY, Waltham and Boston, Mass.: Emery and Corundum Wheels from North Carolina, Georgia and Chester Corundum; also Emery Wheel Machinery, Polishing Lathes, Strapping Machines and Automatic Knife Grinders. Special mention is made of the Ferro-Silicon and of the Boston Flexible Wheels.

WATERBURY MFG. COMPANY, Waterbury, Conn.: Brass and Nickel Harness Trimmings. The catalogue illustrates, with prices, Glass and Metal Rosettes, Spots, Nails, Terrets, Hooks and other miscellaneous Trimmings for the Harness and Saddlery trade. The book is handsomely printed on fine-quality paper, bound in flexible leather covers.

THE KILBOURNE & JACOBS MFG. COMPANY, Columbus, Ohio: Trucks. The catalogue devoted to this line of goods illustrates and describes, with prices, Baggage Barrows and Express Wagons, Store, Warehouse, Railroad, Hotel, Dry Goods, Carpet, Barrel and Wagon Trucks, Grain or Meat Wagons, Hand Carts, Skids, Push Cars, &c.

DETROIT STAMP COMPANY, Detroit, Mich.: Rubber Stamps. Their catalogue of 96 pages illustrates Stencils, Seals, Steel Stamps, Burning Brands, Checks, Badges, Type and Office Specialties, &c.

KEEN BROS. HARDWARE COMPANY, Chicago, Ill.: Mechanics' Tools. Illustrations are given of Carving Tools, Chisels, Spokeshaves, Drawing Knives, Hatchets, Planes, Rules, Levels, Screw Drivers, Hammers, Saws, Braces, Dividers, Pincers, Pliers, Plasterers' and Paper-Hangers' Tools, &c.

A good average harvest is in prospect in Canada, especially in the northwestern districts. The hay and clover crops being especially bountiful, agriculturists will have plenty of such produce to supply the demand from Great Britain which will ensue on the total failure of the grass crop in that country.

It Is Reported—

That Murer & Case's Hardware store, Norfolk, Neb., was burglarized recently, the articles taken being valued at $200.

That W. D. Ball, who has been closely identified with the business interests of Ludlow, Vt., for the past 25 years, has disposed of his Hardware store to Frank Howard of Springfield, Mass., and Henry Brown of Ludlow. They will continue the business at the former stand.

That G. W. Hiser, Lexington, Ill., has built an addition to his Hardware store, which will be used as a tinshop.

That the Hardware store of G. H. Blaker, Maumee, Ohio, was burglarized on the 19th ult.

That D. P. Noyes' Hardware store at Henniker, N. H., was recently burned out.

That the store of Wylie Bros., Elizabeth, Pa., was entered by robbers on the 20th u't., and about $100 worth of Hardware carried away.

That the wholesale Hardware firm of Logan, Gregg & Co., Pittsburgh, suffered slight damage by fire on the 20th ult. Spontaneous combustion is the supposed cause of the fire.

Current Hardware Prices.

JUNE 30, 1893.

Note.—The quotations given below represent the Current Hardware Prices which prevail in the market at large. They are not given as manufacturers' prices, and manufacturers should not be held responsible for them. In cases where goods are quoted at lower figures than the manufacturers name, it is not stated that the manufacturers are selling at the prices quoted, but simply that the goods are being sold, perhaps by the manufacturers, perhaps by the jobbers at the figures named.

The character @ is used to indicate a range of price; thus discount 50&10@50&10&5 % signifies that the goods in question are sold at prices ranging from discount 50 and 10 % to discount 50 and 10 and 5 %.

Adjusters, Blind—

Domestic.....₩ doz $3.00, 33⅓%
Excelsior....₩ doz $10.00.....50&10&2%
North's.....list net @ 10%
Zimmerman's—See Fasteners Blind.

Ammunition—See *Caps, Cartridges, Shells, &c.*

Anvils—

Eagle Anvils, ₩ ℔ 9¢.....15@15&5%
Peter Wright's.....11@11½%
Armitage's Mouse Hole.....10½@11¢
Am. Wrought, Horse shoe brand.11@11½¢
Trenton.....10@10½¢
Wilkinson's.....10½@11¢
Moore & James Mfg. Co.....33⅓%

Anvil Vise and Drill—

Millers Falls Co., $18.00.....20%
Cheney Anvil and Vise.....25%
Allen Anvil and Vise $3.00.....40&10%
Star.....45&5%

Apple Parers—See *Parers, Apple, &c.*

Augers and Bits—

Common Augers and Bits.....70@70&10%
Boring Machine Augers.....70@70&10%
Car Bits, 12-in. twist.....50%
Russell Jennings' Augers and Bits.25&10%
Jennings' Pattern Car Bits.....40%
Jennings' Pattern Auger Bits.....60%
Snell's Bits.....60&5%
C. E. Jennings & Co., No. 10, extension lip.....40%
C. E. Jennings & Co., No. 30.....60%
C. E. Jennings & Co., Auger Bits, ₩ set, 32½ quarters, No. 5, $5; No. 30, $3.50.25%
Lewis' Patent Single twist.....45%
Pugh's Black.....20%
Pugh's Jennings Pattern.....30%
L'Hommedieu Car Bits.....15&10%
Forstner Pat. Auger Bits.....15%
Cincinnati Bell-Hangers' Bits.....80&10

Bit Stock Drills—

Morse Twist Drills.....50&10&5%
Standard.....50&10&5%
Cleveland.....50&10&5%
Syracuse, for metal.....50&10%
Syracuse, for wood (wood list).30@30&5%
Cincinnati, for wood.....30&10%
Cincinnati, for metal.....45&10%

Expansive Bits—

Clark's small, $18; large, $26..35@35&10%
Ives' No. 4, ₩ doz. $60.....40%
Swan's.....40%
Steer's, No. 1, $26; No. 2, $18.....35@40%
Stearns' No. 2, $48.....20%

Gimlet Bits—

Common.....₩ gross $2.75@$3.25
Diamond.....₩ doz $1.25....40&10%
Bee.....25@25&5%
Double Cut, Shepardson's.....45@45&10%
Double Cut, Ct. Valley Mfg. Co....30&10%
Double Cut, Hartwell's, ₩ gro., $5.00..25%
Double Cut, Douglass'.....40&10%
Double Cut, Ives.....60@60&10%

Hollow Augers—

Ives', French, Swift & Co. (Beecher), Douglass'.....33⅓@33⅓ & 10%
Bonney's Adjustable, ₩ doz $48.....50%
Stearns'.....20&10%
Ives' Expansive, each $4.50.....50&5%
Universal Expansive, each $4.50.....20%
Wood's.....25@25&10%
Cincinnati Adjustable.....25&10%
Cincinnati Standard.....25&10%

Ship Augers and Bits—

L'Hommedieu's.....15&10@15&10&5%
Watrous'.....25@25&10%
Snell's.....25@25&10%
Snell's Ship Auger Patt'n Car Bits, 15&10@15&10&5%

Awl Hafts—See *Hafts, Awl.*

Awls—

Awls, Sewing, Common....₩ gr. 85¢@90¢
Awls, Should. Peg.....₩ gr. $1.50@$1.55
Awls, Pat. Peg.....₩ gr. 35¢@38¢
Awls, Shouldered Brad..₩ gr. $1.30@ 1.40
Awls, Handled Brad....₩ gr. $2.50@$3.00
Awls, Handled Scratch..₩ gr. $4.00@4.50
Awls, Socket Scratch..₩ doz. $1.10@$1.20

Awl and Tool Sets—See *Sets, Awl and Tool.*

Axes—

	Plain.	Beveled.
First quality, best brands	$7.00	$7.50
First qual., other brands	6.50 to 6.75	7.00
Second quality	5.50	6.00

Axle Grease—See *Grease, Axle.*

Axles—

No. 1....3½¢@4½¢, No. 2, 5¢@6¢; Nos. 7 to 14.....60&10%; Nos. 15 to 18.....47½%; Nos. 19 to 22.....70%; 3% cash
Concord Axles, loose collar.....4½¢@6¢
Concord Axles, solid collar.....5½¢@7¢
National Tubular Self Oiling.....33⅓%@33⅓&5%

Bag Holders—See *Holders, Bag.*

Balances—

Spring Balances.....40%

	No. 2000	20	30
Chatillon, ₩ doz.	$0.80	0.95	1.75 net

Chatillon Straight Balances.....40%
Chatillon Circular Balances.....50&10%

Barb Wire.—See *Wire, Barb.*

Bars—

Crow—

Cast Steel.....₩ ℔ 3½¢
Iron, Steel Points.....₩ ℔ 3¢

Basins, Wash—

Standard Fiberware, No. 1, 10½-in., $1.80; 12-inch, $2.00; 13½-inch, $2.50; 15-inch, $3.00.

Beams, Scale—

Scale Beams, List Jan. 12, '82..50&10@50&10&5%
Chatillon's No. 1.....40%
Chatillon's No. 2.....50%
Custer's.....33⅓%

Beaters—

Egg—

Dover.....₩ doz $1.00@$1.20
Duplex (Standard Co.).....₩ doz $1.00
Dover (Standard Co.).....₩ doz $1.00
Duplex Extra Heavy (Standard Co.)....₩ doz. $3.50
Bryant's.....₩ gross $14.00
Double (H. & R. Mfg. Co.), ₩ gro., No. 0 $12.00; No. 1, $15.00; No. 2.....$36.00
Easy (H. & R. Mfg. Co.).....₩ gro $12.00
Triple (H. & R. Mfg. Co.).....₩ gro $16.50
Spiral.....₩ gro $4.25 @ $4.50
Improved Acme (H. & R. Mfg. Co.)....₩ gro. $9.00
Silver & Co.....₩ doz $5.50

Culinary—

Keystone, P. D. & Co., Each, No. 1, $1; No. 2, $2.....20%

Bells—

Cow—

Common Wrought.....60&10%
Western, Sargent's list.....70&10%
Kentucky, "Star".....20&10%
Kentucky, Sargent's list.....70&10%
Kentucky Durham.....70&10%
Dodge, Genuine Kentucky....70@70&10%
Texas Star.....50&10@50&10&5%

Door—

Gong, Abbe's.....33⅓&10%
Gong, Yankee.....45&10%
Gong, Barton's.....40&10@50%
Crank, Brooks'.....50&10&2%
Crank, Cone's.....10%
Crank, Connel's.....20&10%
Lever, Sargent's.....60&10%
Lever, Taylor's Bronzed or Plated....net
Lever, Taylor's Japanned.....25&10%
Lever, R. & E. Mfg. Co.'s..50&10&2%
Pull, Brook's.....50&10&2%

Electric—

Wollensak's.....20%
Bigelow & Dowse.....20%

Hand—

Light Brass.....70&10@70&10&5%
Extra Heavy.....70%
White.....70%
Silver Chime.....33⅓&10%
Globe Cone's Patent).....25&10@35%

Miscellaneous -

Call.....45@50%
Farm Bells.....₩ ℔ 3¢&3½¢
Steel Alloy Church and School Bells..40%

Bellows—

Blacksmiths'.....60&10&5@60&10&10%
Moiders'.....40&10@50%
Hand Bellows.....40&10@50%

Belting, Rubber—

Common Standard.....75@75&10%
Standard.....70&5@70&10%
Extra.....60&10@60&10&10%
N.Y.B.&P. Co., Carbon.....60@60&5%
N.Y.B.&P.Co., Diamond.....50@50&5%
N.Y.B.&P.Co., Para.....40@40&5%

Bench Stops—See *Stops, Bench*

Benders and Upsetters, Tire—

Stoddard's Lightning Tire Upsetters..15%
Detroit Perfected Tire Bender.....15%
Green River Tire Benders and Upsetters.....20%

Bits—

Auger, Gimlet, Bit Stock Drills, &c., see *Augers and Bits.*

Bit Holders—See *Holders.*

Blind Adjusters—See *Adjusters, Blind.*

Blind Fasteners—See *Fasteners, Blind.*

Blind Staples—See *Staples, Blind.*

Blocks—

Cleveland Block Co., Mal. Iron.50@50&10%
Moore's Novelty, Mal. Iron.....50%
Sure Grip Steel Tackle Blocks.....25%
See also *Machines, Hoisting.*

Bolts—

Carriage, Machine, &c.—

Com. list June 10, '84.....75&10&5@80%
Genuine Eagle, Norway, list Oct. '84.....80&5@80&10%
Eagle, Norway, list Oct. '84 80@80&10@80&15
Phila. pattern, list Oct. 7, '84..... 80%
R.B.&W., old list.....70%
Machine, list Jan. 1, 1890.....80&10%
Bolt Ends, list Jan. 1, 1890.....80&10%

Door and Shutter—

Cast Iron Barrel, Square, &c.....70&10%
Cast Iron Shutter Bolts.....70&10%
Cast Iron Chain (Sargent's list)....65&10%
Ives' Patent Door Bolts..60&10@60&10&5%
Wrought Barrel.....70&10@75%
Wrought Square.....70&10@75%
Wr't Shutter, all Iron, Stanley's.....60&10@60&10&10%
Wr't Shutter, Brass Knob.....50@50&5%
Wr't Shutter, Sargent's list.....60&10%
Wr't Sunk Flush, Sargent's list....60&10%
Wr't Sunk Flush, Stanley's list.50&10&5%
Wr't B. K.Flush, Common.....55&10%

Stove and Plow—

Stove.....60&10@60&10&5%
Plow.....60&10&50@60&10&10%
R. B. & W., Plow.....55%

Tire—

Common, list Feb. 28, '83.....65@65&5%
Port Chester Bolt and Nut Company:
Empire list Feb. 28, '83.....65%
Keystone, Philadel., list Oct. '84.....80%
Norway, Phila., list Oct. '84.....75%
American Screw Company:
Norway, Phila., list Oct. 16, '84.....75%
Eagle, Phila., list Oct. 16, '84.....80%
Philadel., list Oct. 16, '84.....80%
Bay State, list Feb. 28, '83.....65%
R. B. & W., Philadel., list Oct. 16, '84...80%

Borers, Tap—

Common and Ring.....20&10%
Ives' Tap Borers.....33⅓&5%
Enterprise Mfg. Co.....20%
Clark's.....33⅓@35%

Borax—

Per ℔.....9½@10½¢

Boring Machines—See *Machines, Boring.*

Bow Pins—See *Pins, Bow.*

Boxes, Wagon—

Per ℔.....2¾¢

Boxes, Miter.

Spilker's Excelsior, 3 in. $7.50, 4 in $8 50, 5 in. $13.50, 6 in. $15.00.....20%

Braces—

American Bit Brace and Tool Co..
Nos. 10, 12, 20.....60&10%
Nos. 11, 21, 24, 27.....70&10%
Nos. 22, 23, 25.....60&10&5%
Nos. 13, 26, 36, 37.....70&10&5
Amidon's,
Barker's Imp'd Plain.....75&10@80%
Barker's Imp. Nickeled.....65&10@70%
Ratchet.....75&10@80%
Eclipse Ratchet.....60%
Globe Jawed.....40@40&10%
Corner Brace.....40@40&10%
Universal, 8 in., $2.10; 10 in.....$2.25
Buffalo Ball.....$1.10@$1.15
Barber s.....50&10%
Saxton's,
Barker's Imp. Polished.....75&10@80%
Barker's Imp. Nickeled.....65&10@70%
Ratchet, Polished.....50&10@60%
Ratchet, Nickeled.....40&10@50%
Buffalo Ball.....net, $1.10@$1.15
Bartholomew s,
Nos. 25, 27 and 30.....50&10@60&5%
Nos. 117, 118, 119.....70@70&5%
Common Ball, American.....$1.00@$1.10
Fray's Genuine Spofford's...50&5@50&10%
Fray's Nos. 70 to 120, 81 to 123, 207 to 414 50&10%
Ives' New Haven Novelty.....70@70&5%
New Haven Ratchet.....60&5@60&10%
Barber Ratchet.....60&5@60&10%
Barber's.....60&5%
Spofford.....60&5@60&10%
P. S. & W. Co., Peck's Patent.....60%
Rose & Johnson.....50%
Davis Patent.....50&10%

Brackets—

Shelf, plain,
Regular, list.....65@70%
Sargent's list.....60&10@70&10%
Shelf, fancy,
Sargent's list.....70@70&10%
Other makes at a wide range of prices.
Bradley Shelf Brackets.....70&10%

Bright Wire Goods—See *Wire.*

Broilers—

Henis' Self-Basting.	Inch.....	9	10	9x11
	Per doz..	$4.50	5.50	6.50

New Haven.....50%
Wire Goods Co.....65&10%
Morgan Odorless.....₩ doz. $12, 50%
Queen City.....33⅓%

Buckets, Well—Galvanized—

Hill's.....₩ doz. 12 qt. $4.25; 14 qt. $5.25
Iron Clad.....₩ doz. 14 qt. $4.25@4.50
Helwig's Flat Iron Band.....$3.75
Helwig's Wired Top.....₩ doz $4.00

Bull Rings—See *Rings, Bull.*

Butcher's Cleavers—See *Cleavers Butcher s.*

Brass—

Wrought Brass.....80@80&10%
Cast Brass, Tiebout's.....60%
Cast Brass, Fast.....33⅓&10%
Cast Brass, Loose Joint.....33⅓&10%

Cast Iron—

Fast Joint, Narrow.....50&10&5@60%
Fast Joint, Broad.....50&10@60%
Loose Joint, Loose Joint, Japanned, Loose Joint, Jap. with Acorns, Parliament Butts, Mayer's Hinges, Loose Pin, Acorns, Loose Pin, Acorns, Japanned, Loose Pin, Acorns, Japanned, Plated Tips.....75@75 & 10%

Wrought Steel—

Fast Joint, Narrow, Fast Joint, Lt. Narrow, Fast Joint, Broad, Loose Joint, Broad, Table Butts, Back Flaps, &c., Inside Blind, Regular, Indide Blind, Light, Loose Pin.....List Jan. 2 1893, 40@40&10%
Bronzed Wrought Butts.....50@50&10%

Calipers—See *Compasses.*

Calks, Toe—

Gautier, One Prong, Blunt.....5½@6¢
Burke's One Prong, Blunt.....5½@6¢
Burke's, Two Prong, Blunt.....7½@8¢
Burke's, One Prong, Sharp.....6½@7¢

Can Openers—See *Openers, Can.*

Cans, Milk—

S. S. & Co.: 5-gal., $3.00; 8-gal., $4 40; 10-gal., $4.75 each.....40&10%

Caps—

Percussion—

Hicks & Goldmark's and Union Metallic Cartridge Co.....₩ 1000
F. L. Waterproof, 1-10's.....35@37¢
E. B. Trimmed Edge, 1-10's.....47@50¢
E. B. Grnd. Edge, Cent. Fire, 1-10's.....47@50¢
Musket. Waterproof, 1-10's.....50@53¢
G. D.....27@30¢
S. B. Genuine Imported.....45¢
Eley's E. B.....56@58¢
Eley's D Waterproof, Central Fire..$1.60

Primers—

Berdan Primers, $1.00.....2%
B. L. Caps (Sturtevant Shells) $1.00....2%
All other Primers, $1.20.....2%

Cards—

Watson's Cotton, Wool, Horse and File, list January 28, 1891.....25%

Carpet Stretchers—See *Stretchers, Carpet.*

Cartridges -

Rim Fire Cartridges.....50&5&2½%
Rim Fire Military.....15&5%
Cent. Fire, Pistol and Rifle.....25&5&2½%
Cent. Fire, Military and Sporting 15&5&2½%
Blank Cartridges, except 22 and 32 cal., additional 10% to above discounts.
Blank Cartridges, 22 cal., $1.75.....2%
Blank Cartridges, 32 cal., $3.50.....2%
Primed Shells and Bullets.....15&5&2½%
B. B. Caps, Round Ball, $1.75.....2%
B. B. Caps, Con. Ball, Swgd., $2.00.....2%

Carpet Sweepers—See *Sweepers, Carpet.*

Casters—

Bed, Plate, Shallow Socket... } Brass.....55@55&10%; Others....60@60&10%
Deep Socket.....40&10%
Martin's Patent (Phœnix).45&10@50&10%
Tucker's Patent, low list.....45%
Payson's Anti-friction.....70@70&10%
Payson's Truck.....60@60&10%
Yale Casters, low list.....45%
Yale, Gem.....70%
Giant Truck Casters.....35%
Stationary Truck Casters.....50&10%
Socket Truck Casters.....50@50&10%
Gwinner's Common Sense.....45%
Gwinner's Hercules.....45%

Cattle Leaders—See *Leaders, Cattle.*

Cement—

Victor Elastic.....5 ℔ pails ₩ ℔ 5¢

Chain—

Trace, Wagon and Fancy Chains, List revised May, 1893.....60@60&10%
American Coil, in cask lots,

3-16	¼	5-16	⅜	7-16	½	⅝	¾
$7.60	5.30	4.45	3.80	3.65	3.50	3.40	3.30

Less than cask lots, add½¢@½¢ ₩ ℔
German Coil, list July 12, 1892.....60@60&10%
German Halter Chain, list July 12, 1892. 60@60&10%
Covert Halter.....60&2%
Cover Traces.....35&2%
Cover Heel Chain.....50&2%
Galvanized Pump Chain.
5 ton lots.....₩ 100 ℔ $5.50
1-ton lots.....₩ 100 ℔ $5.75
500 ℔ lots.....₩ 100 ℔ $6.75
Less than 500 ℔.....₩ 100 ℔ $7.00
Oneida Halter Chain.....60@60&5%
Jack Chain, Iron and Brass, list March 10, 1893.....60@60&10%
Barnes' Reinforced Sash.....60&10%
Barnes' Victor Sash.....65%

Chalk—

White, case lots. ₩ gr 50¢; small lots.55¢
Red, case lots....₩ gr 67¢; small lots.75¢
Blue, case lots....₩ gr 75¢; small lots 90¢
See also Crayons

Chalk Lines—See *Lines.*

Checks, Door—
Unity....50%

Chisels—

Socket Framing and Firmer
P. S. & W.
New Haven.
Witherby.
Mix.
Ohio Tool Co.
} 75&10@75&10&10%
Douglass....75@75&5%
Buck Bros....30%
Merrill....60&10@60&10&5%
L. & I. J. White....30@30&5%

Tanged and Miscellaneous.
Tanged Firmers....50@50&10%
Butchers'....$4.75@$5.00
Spear & Jackson's....$5 to £
Buck Bros....30%
Cold Chisels, ₩ lb....15@16¢

Chucks—
Beach Pat....each, $8.00....20%
Morse's Adjustable, each, $7.00,20@20&5%
Danbury....each, $6.00,30@30&5%
Syracuse, Baiz Pat....25%
Graham Patent....33⅓&5%
Skinner's Patent Chucks.
Combination Lathe Chucks....33⅓&5%
Universal Lathe Chucks....40%
Independent Lathe Chucks....40%
Drill Chucks....15%
Union Mfg. Co.
Victor....$8.50, 25%
Combination....40%
Universal....40%
Independent....40%

Churns—
Tiffin Union, each, 5 gal. $3.25; 7 gal., $3.75; 10 gal., $4.25.
McDermaid Star Barrel Churn, each 6 gal., $2.60; 10 gal., $2.75; 15 gal., $3.00; 20 gal., $3.25.

Clamps—
B. I. Tool Co.'s Wrought Iron....25%
Adjustable, Cincinnati....15&10%
Adjustable, Hammers....15@15&5%
Adjustable, Stearn's....30@30&10%
Stearn's Adjustable Cabinet and Corner....30@30&10%
Cabinet, Sargent's....70&10%
Carriage Makers', Sargent's....75@75&5%
Carriage Makers', P., S. & W Co..40&10%
Eberhard Mfg. Co....40&5@40&10%
Warner's....40&10@40&10&5%
Saw Clamps, see Vises, Saw Filers'.
Carpenter's, Cincinnati....25&10%
Barnes' Machinists' Clamps....33⅓&5

Cleavers, Butchers'—
Bradley s....25@30%
L. & I. J. White....20&5%
Beatty's....40@40&5%
New Haven Edge Tool Co.'s....40%
P., S. & W....33⅓&5@33⅓&10%
Foster Bros....30%
Schulte, Lohoff & Co....40@40&5%

Clips—
Norway, Axle, ¼ & 5-16....55&5&5%
3d grade Norway Axle, ¼ & 5-16....65&5%
Superior Axle Clips....66⅔&5@70%
Norway Spring Bar Clips, 5-16..60&5&5%
Wrought Iron Felloe Clips....₩ lb, 5½¢
Steel Felloe Clips....₩ lb, 5¢
Baker Axle Clips....25%

Cloth and Netting, Wire
—See *Wire, &c.*

Cockeyes....50%

Cocks Brass—
Hardware list....60&2%

Coffee Mills—See *Mills, Coffee.*

Collars, Dog—
Chapman Mfg. Company, new list....40%
Medford Fancy Goods Co....40&10@50%
Embossed, Gilt, Pope & Steven's list, 30&10%
Leather, Pope & Steven's list....40%
Brass, Pope & Steven's list....40%

Combs, Curry—
Fitch's....50&10@50&10&10%
Rubber, per doz., $10.00....25%
American Curry Comb Co. ....33⅓&40%
Kohler's Magic Oscillating. ₩ doz., $2.00
Kohler's Humane....₩ doz., $1.75

Compasses, Dividers, &c.
Compasses, Calipers, Dividers.70@70&10%
Bemis & Call Co.'s
Dividers....65%
Compasses....50&5%
Calipers, Inside or Outside....65%
Calipers, Wing....60%
Calipers, Double....65%
Calipers, Call's Patent Inside....55%
Excelsior....50%
J. Stevens & Co.'s....25&10%
Starrett's
Spring Calipers and Dividers....25&10%
Lock Calipers and Dividers....25%
Combination Dividers....25%

Coolers, Water—
S. S. & Co.: 2-gal., $2.00; 3-gal., $2.50; 4-gal., $2.75; 6-gal., $3.40 each....33⅓&5

Coopers' Tools—
See *Tools, Coopers'.*

Cord—

Sash—
Common....₩ lb, 9@10¢
Patent, good quality....₩ lb, 11@12¢
White Cotton Braided, fair...₩ lb, 24@25¢
Common Russia Sash....₩ lb, 12½@13¢
Patent Russia Sash....₩ lb, 13½@ 14¢
Cable Laid Italian Sash....₩ lb, 19@20¢
India Cable Laid Sash....₩ lb, 11½@12¢
Silver Lake—
A quality, White, 50¢....25%
A quality, Drab, 55¢....25%
B quality, White, 30¢....10%
B quality, Drab, 35¢....10%
Sylvan Spring, Extra Braided, White..34¢
Sylvan Spring, Extra Braided, Drab..39¢
Semper Idem, Braided, White....27@28¢
Egyptian, India Hemp, Braided....26¢
Massachusetts, White....29¢
Samson—
Braided, White Cotton....₩ lb, 37¢
Braided, Drab Cotton....₩ lb, 42¢
Braided, Italian Hemp....₩ lb, 40¢
Braided, Linen....₩ lb, 56¢
Tate's Solid Braided—
Hercules, White....₩ lb, 25¢
Hercules, Drab....₩ lb, 30¢
Economy, Drab....₩ lb, 27¢
Economy White....₩ lb 22¢
Ossawan Mills—
Braided Giant, Whit ₩ lb, 30¢....20%
Braided Giant, Drab and Fancy, ₩ lb 35¢....10%
Braided, Crown White, ₩ lb, 50¢...50%
Braided, Crown Drab and Fancy, ₩ lb 55¢....30%

Wire Picture—
Braided or Twisted....80&5@80&15%

Corkscrews—See *Screws, Cork.*

Corn Knives and Cutters
—See *Knives, Corn.*

Crackers Nut—
Table (H. & B. Mfg. Co)....40%
Blake's Pattern, ₩ doz., $2.00....10%
Turner & Seymour Mfg. Co....50%
Acme.
Japanned, ₩ gro., $30....50%
Nickel Plated, ₩ gro. $30....10%

Cradles—
Grain....50&2@50&5&2%

Crayons—
White Crayons, ₩ gross....7@8¢
D. M. Stewart Mfg. Co.:
Metal Workers', ₩ gross, $1.75....25%
Rolling Mill, ₩ gross, 2.50....25%
Railroad, ₩ gross, 2.00....25%
Soapstone Pencils, ₩ gross,1.00....25%
See also *Chalk.*

Creamery Pails—See *Pails, Creamery.*

Crow Bars—See *Bars, Crow.*

Curry Combs—
See *Combs, Curry.*

Curtain Pins—
See *Pins, Curtain.*

Cutters—

Meat—
Dixon's, ₩ doz....40&5%

Nos.	1	2	3	4
	$14.00	$17.00	$19.00	$30.00

Woodruff's, ₩ doz....40&5%

Nos.		100	150
		$15.00	$18.00

Hale's Pattern, ₩ doz....70%

Nos.	11	12	13
	$27.00	$33.00	$45.00

American....30%

Nos.	1	2	3	4	B	5
Each.	$5	$7	$10	$25	$50	$60

Enterprise....25%

Nos.	10	12	22	32	42
Each	$3	$2.50	$4	$6	$15

Miles' Challenge, ₩ doz....45@45&10%

Nos.	1	2	3
	$22.00	$30.00	$40.00

Home No. 1, ₩ doz., $26.00....55&10%
Draw Cut, each:

Nos.	5	2	6	8
	$50	$75	$80	$225

....20@25%
Beef Shavers (Enterprise)....20%
Little Giant (P. S. & W. Co.)....50%
Chadborn's Smoked Beef Cutter, ₩ doz., $66.00

Slaw and Kraut—
Tucker & Dorsey Mfg. Co.:
Slaw Cutters, 1 Knife, ₩ gross...$21.00
Slaw Cutters, 2 Knife, ₩ gross... 30.00
Kraut Cutters....40%

Tobacco
Champion....20&10@30%
All Iron....₩ doz., $4.25
Nashua Lock Co.'s..₩ doz., $18.00, 50@55%
Wilson's....55%
Sargent's....₩ doz., $24.00, 55&10
Acme....₩ doz., $20.00, 40%

Washer—
Smith's Pat....₩ doz., $12.00, 20&10&10%
Johnson's....₩ doz., $11.00, 33⅓%
Penny's..₩ doz.,, Pol. $14 ; Jap'd, $16, 55%
Appleton's....₩ doz., $16.00, 60&10%
Bonney's....30&10%
Cincinnati....25&10%

Dampers, &c.—
Dampers, Buffalo....40&10%
Buffalo Damper Clips....40&10%
Crown Damper....40%
Excelsior Hot Air....50%

Diggers, Post Hole, &c.—
Samson, ₩ doz., $34.00....25@25&10%
Fletcher Post Hole Augers, ₩ doz., $36.00, 20@20&10%
Eureka Diggers....₩ doz. $12.00@$13.00
Vaughan's Post Hole Auger, ₩ doz., $8.50@$9.50
Kohler's Little Giant....₩ doz., $18.00
Kohler's Hercules....₩ doz., $14.00
Kohler's Invincible....₩ doz., $12.00
Kohler's New Champion....₩ doz., $8.00
Scheidler....₩ doz., $18.00
Cronk's Post Bars, ₩ doz., $60.00, 50&5@50&10%
Gibb's Post Hole Digger....₩ doz.,$15.00
Gibbs' National....₩ doz., $12.00
Gibbs' Columbia....₩ doz., $13.00
Gibbs' Imperial....₩ doz., $7.50
Shimer's Hollow Handle..₩ doz., $24.00, 50%

Dividers—See *Compasses.*
Dog Collars—See *Collars, Dog.*
Door Checks—
See *Checks, Door.*
Door Springs—
See *Springs, Door.*

Drawers.
Money, ₩ doz....$18@$20
Waddel's Improved, ₩ doz....$15.00

Drawing Knives—
See *Knives, Drawing.*

Drills and Drill Stocks—
Blacksmiths'....each $1.75
Blacksmiths' Self-Feeding, each $7.50, 20%
Breast, P. S. & W....40&10%
Breast, Wilson's....30&5%
Breast, Millers Falls....each $3.00, 25%
Breast, Bartholomew's....each $2.50 25&10@40%
Ratchet, Merrill's....20@20&5%
Ratchet, Ingersoll's....25%
Ratchet, Parker's....20@20&5%
Ratchet, Whitney's....20&10%
Ratchet, Weston's....20@25%
Ratchet, Moore's Triple Action....25@30%
Ratchet, Curtis & Curtis....30%
Whitneys Hand Drill, Plain, $11.00; Adjustable, $12.00....20&10%
Automatic Boring Tools....$1.75@$1.85
Chicopee Automatic Drill....20&10%
Goodell Automatic Drills....40&5%

Twist Drills—
Cleveland....50&10&10%
Diamond, W. & B....50&10&10%
Graham's Pat. Groove Shank.50&10&10%
Morse....50&10&10%
New Process....50&10&10%
Standard....50&10&10%
Syracuse (Metal list)....50&10%

Drill Bits or Bit Stock Drills—See *Augers and Bits.*

Drill Chucks—See *Chucks.*

Dripping Pans—
See *Pans, Dripping.*

Drivers, Screw—
Douglass Mfg. Co....20@20&10%
Disston's....50%
Buck Bros....30%
Stanley R. & L. Co.'s
No. 64, Varnished Handles....65&10%
No. 86....70&10%
Sargent & Co.'s
No. 1, Forged Blade....60&10&10%
Nos. 20, 40 and 60....66⅔&10&10%
P. S. & W....70%
Knapp & Cowles
No. 1....60&20@70%
No. 2....60&10&10@70&5%
No. 3....60&5@60&10%
Nos. 4 and 00, Acme and Ideal...50&5@50&10&5%
Stearns'....25&10&5%
Gay & Parsons....35%
Champion....25&10%
Clark's Pat....30@33⅓%
Ellrich's Socket and Ratchet..25@25&10%
Allard's Spiral, new list....25%
Kolb's Common Sense..₩ doz., $6.00, 25&10%
Syracuse Screw-Driver Bits....30&30&5%
Screw Driver Bits....₩ doz., 50@75¢
Screw Driver Bitts, Parr's..₩ gross, $6.25
Fray's Hol. H dle Sets...No. 3, $12.00, 45%
Cincinnati....25&10%
Brace Screw Drivers....25&10%
Buck Bros.' Screw Driver Bits....27½&5%
Goodell's Automatic....50%
Mayhew's Black Handle....50%
Mayhew's Monarch....45&10%
C. T. Williamson Wire Novelty Co....50%

Egg Beaters—See *Beaters, Egg*

Egg Poachers—
See *Poachers, Egg.*

Electric Bell Sets—
See *Bells, Electric.*

Emery—No. 4 to No. 54 to Flour, CF.

	46 gr.	150 gr.	F.FF.
Kegs, ₩ lb....	4½¢	5 ¢	2½¢
½ kegs, ₩ lb...	4¾¢	5¼¢	2¾¢
¼ kegs, ₩ lb...	5 ¢	5½¢	3 ¢
10-₩ cans, 10 in case....	6 ¢	6¼¢	5 ¢
10-lb cans, less than 10....	10 ¢	10 ¢	7½¢

Enameled and Tinned Ware—See *Ware, Hollow*

Escutcheon Pins—
See *Pins, Escutcheon.*

Escutcheons—
Door Lock....Same dis. as Door Locks.
Brass Thread....60@60&10%
Wood....25%

Expanded Metal—
List No. 5.

Lathing....10%
Fencing, Painted Sheets....20%
Netting, Painted Sheets....20%
Door Mats, Galvanized....25%
Window Guards, Paneled....15%
Tree Guards, Paneled....15%

Extractors, Lemon Juice
—See *Squeezers, Lemon.*

Fasteners, Blind—
Mackrell's, ₩ doz., $1.00....20@20&10%
Van Sand's Screw Pat, $15 ₩ gr.. 60&10%
Van Sand's Old Pat., $15 ₩ gr....55&10%
Austin & Eddy No. 2008....₩ gr., $9.00
Security Gravity....₩ gr., $9.00
Zimmerman's....50&10%

Faucets—
Fenn's....40%
Fenn's Cork Stops....33⅓%
Star....60%
Frary's Pat. Petroleum....60%
B. & L. B. Co.
West's Lock, Open and Shut Key...60%
Star, Metal Plug, new list....40%
Lockport, Metal Plug, reduced list..60%
Metallic Key, Leather Lined....60&10@ 60&10&10%
Cork Lined....70&5@70&10%
Burnside's Red Cedar....50%
Burnside's Red Cedar, bbl. lots....50&10%
John Sommers'
Peerless Best Block Tin Key....40%
IXL, 1st quality, Cork Lined....50%
Diamond Lock....40%
Perfection, Fla. Red Cedar(in boxes)40%
Boss Metallic Key....50%
Reliable Cork Lined....60%
O. K. Western Pattern Cork Lined..50%
No Brand, Red Cedar (in bbls.)..50&10%
Western Pattern Metal Key....40%
No Brand Metal Key....60%
Self Measuring
Enterprise, ₩ doz., $36.00....20%
Lane's ₩ doz., $36.00....25&10%

Felloe Plates—
See *Plates, Felloe.*

Fibre Ware—See *Ware, Fibre.*

Fifth Wheels—
Derby and Cincinnati....45&5%
Brewster....50&5%

Files—

Domestic—
Nicholson Files, Rasps, &c.60&10&5@ 60&10&10%
Nicholson (X.F.) Files....25%
Nicholson's Royal Files (Seconds)....75% (extra prices on certain sizes.)
American....66⅔&10@66⅔&10&5%
G. & H. Barnett (Black Diamond) 60&10@60&10&5%
Arcade....60&10&10@70%
Eagle....60&10&10@70%
Other makers, best brands..60&10&5@70%
Fair brands....70&10@70&10&10%
Second quality....80@80&5%
Heller's Horse Rasps....50&7½@50&10%
McCaffrey's Horse Rasps....50&10%
Chelsea Horse Rasps, Hand Cut...50&10%
Arcade Horse Rasps....60&10@60&10&5%
Trojan Horse Rasps....60&10&5%

Imported—
Butcher....Butcher's list, 20%
Stub's....Stubs' list, 25@30%

Fixtures Grindstone—
Sargent's Patent....70&10%
Reading Hardware Co....30&10%
P., S. & W. Co....50&10%
Moore's....55%

Fluting Machines—
See *Machines, Fluting.*

Fluting Scissors—
See *Scissors, Fluting.*

Fodder Squeezers—
See *Squeezers, Fodder.*

Forks—
Hay, Manure, &c. Asso. List, 70@70&5&2%
Hay, Manure, &c., Phila. List, 60@60&10&2%
Plated, see Spoons.

Frames—

Saw—
White Vermont....₩ gro., $9.00@$10.00
Red, Polished and Varnished....₩ doz., $1.50, 25%

Screen, Window and Door—
Porter's Pat. Window and Door Frame, 33⅓&10%
Warner's Screen Corner Irons....33⅓@ 33⅓&10%
Stearns' Frames and Corners..25@25&10%
Cortland....40@40&5
Phillips' Window Screen Frames....50@50&5%
Bonanza Window Screens..50&5@50&10%
Empire Fancy Screen Doors, ₩ doz ..$12

Freezers Ice Cream—
White Mountain....60@60&5%
Granite State....65@65&5%
Arctic....70@70&5%
American....60%
Buffalo Champion....65@65&5%
Shepard's Lightning....65@65&5%
Gem....65%
Blizzard....70%
Double Action Crown....60%
Crown....60%
Star....60%
Peerless....60&10%
Giant....60%
Zero....70%
Boss and Pet....60&10&10&10%
Keystone, P., D. & Co., each, $1.50....20%
Standard....60@60&5%
Standard Double Action....60@60&5%
Expert....65@65&5%
Model....60@60&5%
Confectioners' Machine....50%

Fruit and Jelly Presses—
See *Presses, Fruit and Jelly.*

Fruit Pickers—
See *Pickers, Fruit.*

Fry Pans—See *Pans, Fry.*

Funnels—
Gersdorff's Perfection, Standard and Globe; *Tin*, 1 gro., 10%; 2 to 5 gro., 20%; 5 to 10 gro....30%
Copper, 1 to 6 doz., 15%; 6 to 12 doz., 20%; over 12 doz....25%

Furnaces, Soldering—
Burgess No. 3 Gem tin reservoir....$7.00
Burgess No. 3 Gem, Copper reservoir.$8.50
Clayton & Lambert No. 1 Fire-Pot, complete....$6.00

Fuse—Dis. 12½@15%. ₩ 1000 ft.
Common Hemp Fuse, for dry ground..$2.70
Common Cotton Fuse, for dry ground 2.85
Single Taped Fuse, for wet ground.. 3.85
Double Taped Fuse, for very wet gr.. 4.80
Triple Taped Fuse, for very wet gr.. 5.60
Small Gutta Percha Fuse, for water. 7.50
Large Gutta Percha Fuse, for water.12.00

Gates Molasses—
Stebbin's Pattern....80@80&5%
Stebbin's Genuine....60&10&10%
Stebbin's Tinned Ends....40&10%
Lincoln's Pattern....70@70&10%
Weed's....20&10%
Boss, ₩ doz.:
No. 1, $7; No. 2, $8; No. 3, $9; No. 4, $10....60&10&10%

Gauges—
Marking, Mortise, &c....60&10%
Starrett's Surface, Center and Scratch. 25&10%
Stanley R. & L. Co.'s Butt and Rabbet Gauge....20&10%
Barrett's Comb. Roller Gauge....₩ doz $8.00@$8.50
Hoague & Peck's Champion Gauge—
With Scale....₩ doz., $5.00
Without Scale....₩ doz., $4.00
Wire, Wheeler, Madden & Co....10%
Wire, Morse's....25%
Wire, Brown & Sharpe's....10@20%
Wire, P., S. & W. Co....10&10%

Gimlets—
Nail and Spike....50&10&5%
Eureka Gimlets....60&10%
Diamond Gimlets....₩ gr $5.00
Double Cut, Shepardson's....45@45&5%
Doub e Cut, Ives'....60@60&5%
Double Cut, Douglass'....40&10%

Glue—
1 e Page's Liquid....25@25&5%
Upton's Liquid....35%
Improved Process....25@25&5%
Dodd's Liquid Glue....25@25&5%

Glue Pots—See *Pots, Glue.*

Grease, Axle—
Fraser's....Keg ₩ lb 4¢, Pail ₩ lb 5¢
Fraser's, in boxes....₩ gr $9.50
Dixon's Everlasting, in bxs. ₩ doz 1 lb $1.20; 2 lb $2.00
Dixon's Everlasting....10-lb pails, ea. 35¢
Lower grades, special brands, ₩ gr $5.50@$7.00
Axleine, tin boxes....₩ gross $12.00
English Coach, wooden boxes ₩ gross $8.50
English Coach, 5-lb tin pails. ₩ doz.$3.50
Tiger, wooden boxes....₩ gross $7.00
Tiger, 5-lb tin pails....₩ doz $2.85

Grindstones—
Family, regular list....60%
Family, Cleveland Stone Co....90%

Grindstone Fixtures—
See *Fixtures, Grindstone.*

Gun Powder—See *Powder.*

Hack Saws—See *Saws.*

Hafts, Awl—
Sewing, Brass Fer, ₩ gr....$1 75
Pat. Sewing, Short. ₩ doz....45@50%
Pat. Sewing, Long....₩ doz $1.20
Pat. Peg, Plain Top.₩ doz....40@45%
Pat Peg, Leather Top....₩ doz @50%

Halters—

Covert's, Rope, Jute.....60&10&10&2%
Covert's Rope, 7-16-in., Jute.....70&2%
Covert's Rope, ½ in., Hemp.....50&2%
Covert's Adj. Rope Halters.....40&2%
Covert's Hemp Horse and Cattle Tie, 50&10&2%
Covert's Jute Horse Ties.....70&2%
Covert's Jute Cattle Ties.....70&10&2%
Covert's Adj. Web Halters.....35&5&2%
Covert's Saddlery Works Halters...33⅓&5
Covert's Saddlery Works Horse and Cattle Ties.....33⅓&5
Covert's Saddlery Works Handy Web Halters.....33⅓&5

Hammers—

Handled Hammers—

Maydole's, list Dec. 1, 85..... 25&10@35&
Buffalo Hammer Co.....
Humason & Beckley.....
Atha Tool Co.....
Verree..... } ....50&10&
C. Hammond & Son.....40&10@—&
Fayette R. Plumb.
Artisans' Choice, A. E. Nail.....40&10&
Regular Y. & P., A. E. Nail.....50&
Horseshoe Turning Hammers.....50&
Other Hammers.....50&10&
Cheney's Claw.....40&10&
Cheney's Machinist's & Riveting...50&5&
Magnetic Tack, Nos. 1, 2, 3, $1.25, 1.50 & 1.75.....30&10&
Nelson Tool Works.....40&10&
Warner & Nobles, new list.....25&10
Peck, Stow & Wilcox.....35@40&
Sargent's.....40@40&10&

Heavy Hammers and Sledges—

8 ℔ and under...℔ ℔40¢
8 to 5 ℔.....℔ ℔36¢ } 75&10@75&10 &5%
Over 5 ℔.....℔ ℔30¢
Wilkinson's Smiths.....10½¢@11¢℔ ℔

Handcuffs and Leg Irons

—See *Police Goods.*

Handles—

Cross-Cut Saw Handles—

Atkins', new list 40%
Champion.....15%
Ely's Perfection.....℔ doz., $3.00

Iron, Wrought or Cast—

Door or Thumb.

Nos.....	0	1	2	3	4
Per doz.	$0.90	1.00	1.08	1.35	1.50

60&10&10%
Roggin's Latches.....℔ doz 30¢@35¢
Bronze Iron Drop Latches..℔ doz 70¢ net
Jap'd Store Door Handles—Nuts, $1.62; Plate, $1.10; no plate, $0.88.....net
Barn Door, ℔ doz $1.40.....10&10%
Chest and Lifting.....70@70&10%

Wood—

Saw and Plane.....40&10@50%
Hammer, Hatchet, Axe, &c.....40@40&5%
Brad Awl.....℔ gr $2.00
Hickory Firmer Chisel, ass'd. ℔ gr 4.50
Hickory Firmer Chisel, large. ℔ gr 5.00
Apple Firmer Chisel, ass'd...℔ gr 5.00
Apple Firmer Chisel, large...℔ gr 6.00
Socket Firmer Chisel, ass'd..℔ gr 3.00
Socket Framing Chisel, ass'd.℔ gr 5.00
J. B. Smith & Co.'s Pat File.....50%
File, assorted.....℔ gr 2.75
Auger, assorted.....℔ gr 5.00
Auger, large.....℔ gr 7.00
Pat. Auger, Ives'.....30&10%
Pat. Auger, Douglass.....℔ set $1.25
Pat. Auger, Swan's.....℔ set $1.00
Hoe, Rake, Shovel, &c.....60@60&5%

Hangers—

Barn Door, old patterns.....70@70&5%
Barn Door, New England.....70@70&5%
Samson Steel Anti-Friction.....55%
Orleans Steel.....55%
Hamilton Wrought Steel Track.....55%
Champion.....60&10%
Climax Anti-Friction.....55%
Zenith for Wood Track.....55%
Sterling.....50&10&60%
Victor, No. 1, $15.00; No. 2, $16.50; No. 3, $18.00.....50&2%
Kidder's.....50@50&10%
Boss.....60&10@60&10&5%
Best Anti-Friction.....60&10@60&10&5%
Duplex (Wood Track).....60&10&5%
Terry's Modern.....50&10&50&10&5%
Terry's Ideal.....50&10@50&10&5%
Terry's Solid.....50&10@60%
Terry's Shield.....50&10@60%
Terry's Wrought Single Strap.....50&10%
Cronk's Patent, Steel Covered.....50&10%
Carrier Steel Anti-Friction.....50&10%
Richards'.....30@30&10%
Lane's New Standard.....60@50&5%
Lane's Standard.....50&5@50&10%
Lane's Parlor.....40%
Warner's Pat.....20&10&10%
Sears' Anti-Friction.....20&10&10%
Stearns' Challenge.....25&10&10%
Cincinnati Nos. 1, $2.25; 3, $2.50; 4, $2.50.....
Paragon, Nos. 5, 5¼, 7 and 8.....20&10%
Crescent.....60@60&10%
Nickel, Steel, Nos. 0, $25; 1, $20; 2, $15.....40&10@50%
Chicago Anti-Friction.....30&10%
Star.....40&10@40&10&5%
Barry.....50%
Interstate.....50&10@60%
Pendulum, Payson's.....40@40&10%
Moody.....45%
Economy, $6.00.....50&10%
Perfection.....50&10@50&10&5%
Lundy, Steel Parlor.....40%
Matchless.....50&10%
Magic.....45&10%
Wild West.....45&10%
Moore's Elevator.....33⅓&
Moore's Baggage Car Door.....33⅓&
Moore's Railroad.....55%

Harness Snaps—See *Snaps.*

Hatchets—

American Axe and Tool Co.
Blood's.....
Hunt's.....
Hurd's.....
Mann's.....
Peck's.....
Underhill's..... } 40 & 10 @ 50&5%
Buffalo Hammer Co.....
Fayette R. Plumb.....
C. Hammond & Son.....
Kelly's.....
Sargent's & Co.....
P., S. & W. Co.....
Ten Eyck Edge Tool Co.....
Collins.....10%
Schulte, Lohoff & Or.....50@5C&5%

Hay and Straw Knives—

See *Knives.*

Hinges—

Blind Hinges—

Parker.....75&2%
Huffer.....50%
Clark's, Nos. 1, 3, 5, 40 and 50..80@80&5%
Clark's Mortise Gravity.....50%
Sargent's, Nos. 1, 3, 5, 11, 12, 13..75@75&10%
Reading's Gravity.....75&10@75&10&5%
Shepard's.
Noiseless.....75&10%
Niagara.....80%
Buffalo.....80%
Clark's Genuine Pattern.....80%
O. S., Lull & Porter.....75&10%
Acme, Lull & Porter.....75%
Queen City Reversible...70&10&5@75%
Clark's, Lull & Porter, Nos. 0, 1, 1½, 2, 2½, 3.....75&10&2½%
North's Automatic Blind Fixtures, No. 2, for Wood, $9.00; No. 3, for Brick, $11.50.....10%

Gate Hinges—

Western.....℔ doz $4.20, 60@60&10%
N. E.....℔ doz $7.80, 60@60&10%
N. E. Reversible ℔ doz..$5.60, 6 @60&10%
Clark's, Nos. 1 2, 3.....60&10&5%
N. Y. State... .....℔ doz $4.90,60@60&10%
Automatic.....℔ doz $12.50, 50%
Shepard's.....60&10&5%

Spring Hinges—

Geer's Spring and Blank Butts....40%
Union Spring Hinge Co.'s list, March, 1886.....20%
Barker's Double Acting.....25%
Union Mfg. Co.....25%
Bommer's.....30%
Buckman's.....15@20%
Chicago.....30%
Bardsley's Patent Checking 15%
Acme.....30%
U. S.....25&10%
Empire and Crown.....20%
Hero and Monarch.....55%
American, Gem and Star.....20%
Oxford.....20%
Royal.....66⅔&5%
Reliable.....60%
Champion.....60%
No. 10 Matchless.....60%
No. 25 Unbreakable.....60%
J. G. C. Covered, ℔ gro., $30.....50&5%
Samson.....60@60&7½%
Wiles', No. 1, ℔ gro., $16; No. 2.....$13
Devore, No. 1.....℔ gro , $13.00
Rex.....℔ gro., $13.00
Freeport.....℔ gro., $12.00
New Idea Nos. 1 and 10....℔ gross $13.00
New Idea Dbl. Acting.....45%
Ideal No. 3.....℔ gross $10.00
Stearns' Noiseless Floor Hinge, ℔ set $5.00.....20&10@30%

Extra 5@10% often given.

Wrought Iron Hinges—

List February 14, 1891.
Strap and T.....50&10@50&10&5%
Corrugated Strap and T.....50&10&5%
Screw Hook and Strap... { 6 to 12 in., ℔ ℔.. 4¢ / 14 to 20 in., ℔ ℔..3½¢ / 22 to 36 in., ℔ ℔.. 3¢
Screw Hook and Eye.... { ⅝ in., ℔ ℔ 7¾¢ / ⅝ in., ℔ ℔ 5¾¢ / ½ in., ℔ ℔ 4¾¢
Rolled Blind Hinges, Nos. 32 and 34 50&10%
Rolled Blind Hinges, Nos. 252 and 234 55&10%
Rolled Plate.....70&10%
Rolled Raised.....70&10¢
Plate Hinges { 8, 10 & 12 in., ℔ ℔.....5¢ / "Providence" { over 12 in. ℔ ℔.....4¢

Hoes—

Eye—

D. & H. Scovil.....20%
Lane's Crescent, Planters' Pattern.45&5%
Lane's Razor Blade, Scovil Pattern...30%
Maynard, S. & O. Pat.....45&5%
Sandusky Tool Co., S. & O. Pat } 60&5
Am. Axe and Tool Co., S. & O. Pat... } @60&10%
Chattanooga Tool Co., S. & O. Pat..60& 5@60&10%
Grub.....60&10%

Handled—

Garden, Mortar, &c... .....70@70&5&2%
Planter's, Cotton, &c.....70@70&5&2%
Warren Hoe.....60@60&5%
Magic.....℔ doz $4.00

Hog Rings and Ringers—

See *Rings and Ringers—*

Hoisting Apparatus—

See *Machines, Hoisting.*

Hollow-Ware—

See *Ware, Hollow.*

Holders—

Bag—

Sprengle's Pat.....℔ doz $18....60%

Bit—

Extension.
Barber's, ℔ doz $15.00.....40@40&10%
Ives, ℔ doz $20.00.....60&5@60&10%
Diagonal.....℔ doz $24.00, 40%
Angular.....℔ doz $24.00, 40&5%

File and Tool—

Balz Pat.....℔ doz $4.00, 25%
Nicholson File Holders.....20%

Sash—

Motley's Adj. Sash, Medium Size..... ℔ doz $1.20, 40%

Hooks—

Cast Iron—

Bird Cage, Sargent's List....
Bird Cage, Reading..... } 60&10&10%
Clothes Line, Sargent's list
Clothes Line, Moore's.....70%
Clothes Line, Reading list. 60&10@60&10&10%
Ceiling, Sargent's list.....55&10&10%
Harness, Reading list..55&10@55&10&10%
Coat and Hat, Sargent's list. 55&10@60&10%
Coat and Hat, Reading. 50&10@50&10&10%
Coat and Hat, Moore's 70%

Wrought Iron—

Cotton.....℔ doz $1.25
Cotton Pat. (N. Y. Mallet and Handle Wks.....30%
Tassel and Picture, T. & S. Mfg.Co....50%
Wrought Staples Hooks, &c. See Wrought Goods

Wire—

Wire Coat and Hat, Gem, list April, 1886.....60@60&10
Wire Coat and Hat, Miles, list April, 1886.....50@50&10%
Indestructible Coat and Hat...45@45&5%
Wire Coat and Hat, Standard.60@60&10%
Handy Hat and Coat.....50&10@60%
Steady Ceiling Hooks.....50&10@60%
Belt .....80&15@80&20%
Atlas, Coat and Hat.....65%
Williamson's Bird Cage Hooks, List April, 1892.....40%
Bright Wire Goods—See Wire.

Miscellaneous—

Grass,No.2, $2.00; No.3, $2.10; No. 4, $2.25
Nolin's Grass.....℔ doz $2.25
Bush.....55@60%
Whiffletree—Patent.....55%
Hooks and Eyes—Malleable Iron. 70@70&10%
Hooks and Eyes—Brass.....60&10&10%
Fish Hooks, American.....50%
Bench Hooks—See Bench Stops.

Horse Nails—See *Nails, Horse*

Horse Shoes—

See *Shoes, Horse.*

Hose, Rubber—

Competition, Fair quality.....75@75&10%
Competition, Low Grade.....80@80&10
Standard.....70&10&70@10&5%
Extra.....60&10@60& 10&10%
N. Y. B. & P. Co., Para.....25&5%
N. Y. B. & P. Co., Extra.....40&5@50%
N. Y. B. & P. Co., Dundee.....60@60&5%
Cotton Garden, ¾ in., coupled:
Fair Quality, ℔ ℔.....7¢
Good Quality, ℔ ℔.....8½¢

Huskers—

Blair's Adjustable.....℔ gr $8.00
Blair's Adjustable Clipper.....℔ gr 7.00
Hubbard's Solid Steel.....℔ gr 4.50

Indurated Fiber Ware—

See *Ware, Indurated Fiber.*

Irons.

Sad—

From 4 to 10, at factory....℔ 100 ℔, $2.30@$2.40
Self-Heating.....℔ doz $8.00
Self-Heating Tailors'.....℔ doz $18.00
Enterprise Irons..... } See
Enterprise Star Irons... } *Trade Report.*

Mrs. Potts' Sad Irons, per set:

	No. 50	55	60	65
25 doz	$0.78	$0.73	$0.90	$0.82
12 "	.83	.78	.97	.88
Small lots	.90	.85	1.05	.95

Crown.....60&10@60&10&5%
Ideal Irons, new list...50&10@50&10&10%
Salamander Irons.....25%
B. B. Sad Irons, ℔ ℔.....3@3¼¢
Chinese Laundry (N.E.Butt Co.).8¾¢, 15%
New England.....5¢, 20@20&5%
Mahony's Troy Pat. Irons.....25%
Sensible, list Jan. 91.....50&10&5%
Sensible Tailor's Irons.....33⅓&
National Self-Heating.....30%

Soldering—

Soldering Coppers .....℔ ℔ 19@21¢
Covert's Adjustable, list Jan. 1, 1886. 35&2%
Tinker's Dread. ℔ doz $1.75; ℔ gro. $18

Pinking—

Pinking Irons, ℔ doz., 55@60¢.

Jack Screws—See *Screws.*

Jacks, Wagon—

Daisy.....33⅓&
Victor.....33⅓&
Lockport.....40%

Kettles—

Brass, Spun, Plain, list Jan. 1, '91..25&5%
Brass, Spun, Pld.W.M.list Jan. 1, '91..20%
Stamped Brass Kettles.....℔ ℔ 21¢
Enameled and Tea—See *Ware, Hollow.*

Keys—

Lock, Ass'n list Dec. 30, 1886..65&10@70%
Eagle, Cabinet, &c..... .....33⅓&2%
Hotchkiss' Brass Blanks.....40%
Hotchkiss' Copper and Tinned..... ..40%
Hotchkiss' Pad. and Cab.....35%
Wollensak Tinned.....50&10%

Knife Sharpeners—

See *Sharpeners, Knife.*

Knives—

Butcher, Shoe, &c.

Wilson's Butcher Knives, List Dec 8, 1890.....25%
Ames' Butcher Knives.....25%
Foster Bros.' Butcher, &c.....40%
Jordan's AA A1 Butchers', list.....net
Nichols' Butcher Knives.....40&10%
W. W. Wilson, Butcher, 6 in., $2.00; 7 in., $2.70; 8 in., $3.80, &c.
Ames' Shoe Knives.....20@25%
Ames' Bread Knives, ℔ doz $1.50, 15@20%
Moran's Shoe and Bread.....20@20&10%
Hay and Straw—See Hay Knives.
Table and Pocket—See Cutlery.

Corn—

Bradley's.....10%
Wadsworth's.....25@25&10%

Drawing—

Witherby..... }
P., S. & W..... } ...75@75&10&5%
Mix..... }
New Haven..... }
Merrill.....60&10@60&10&5%
Douglass.....75&75@5
Watrous.....15&10@25%
L & I. J. White.....20&
Bradley's.....8&
Adjustable Handle.....25@33⅓&
Wilkinson's Folding.....25@25&

Hay and Straw—

Lightning, from jobbers....$8.00@$9.00
Wadsworth's.....40&7½@40&10%
Carter's Needle...℔ doz. $11.00@$11.50
Heath's.....℔ doz. $13.00@$13.50
Nolin's Hay.. .....℔ doz. $7.00@$8.00

Mincing—

Am. (2d quality), ℔ gr., 1 blade, $7 2 blades, $12; 3 blades, $18.....net
Lothrop's.....20&10%
Smith's, ℔ doz., Single, $2; Double $3 45&50%
Knapp & Cowles.....50&10@60%
Buffalo Adjustable....℔ doz. $3.00, 33⅓&

Knobs—

Door, Mineral .....60@65%
Door, Por. Jap'd.....70@75%
Door, Por. Nickel.....$2.00@$2.25
Door, Por. Plated Nicke..l....$2.00@$2.25
Drawer, Porcelain.....60&10@60&10&10%
Hemacite Door Knobs.....40&10&50%
Yale & Towne Wood, list Dec., 1885..40%
Base, Rubber Tip.....70&10&5%
Picture, Judd's.....60&10&10&70%
Picture, Sargent's.....70&10%
Picture, Hemacite.....35&5%
Shutter, Porcelain.....65& 10%
Carriage, Jap..... ...℔ gro 80¢, 60&10%
Bardsley's Wood Door, Shutter, &c...15%

Ladders.

Davies Extension and Single.....20&5%

Ladies—

Melting, Sargents'..... .....60@60&5%
Melting, Reading.....35&10%
Melting, P., S. & W.....35&10&40%
Melting, Warner's.....30%

Lanterns—

Tubular—

Regular, with Guard.....℔ doz $3.50
O. K., with Guard.....℔ doz $3.75
Side Lift, with Guard.....℔ doz $4.00
Square Lift, with Guard.....℔ doz $4.25
Anti-Friction, with Guard.....℔ doz $4.50
Brass Plated, Sq. Lift, Guard.℔ doz $5.50
Cop. Plated, Sq. Lift, Guard..℔ doz $5.50

Bull's Eye Police—

2¾-inch regular.....℔ doz $3.00
3-inch regular.....℔ doz $3.00
2¾-inch flash light.....℔ doz $4.00
3-inch flash light.....℔ doz $4.50

Lawn Mowers—

See *Mowers, Lawn.*

Leaders, Cattle—

Humason, Beckley & Co.'s.....70%
Sargent's..... .....70&10@70&10&10%
Hotchkiss.....30%
Peck, Stow & W. Co.....60&10%

Lemon Squeezers—

See *Squeezers, Lemon.*

Lifters, Transom—

Wollensak's:
Class 3 and 4, Bronzed Iron.....60%
Class 3 and 4, Bronze Metal.....50%
Class 3 and 4, Brass.....50%
Skylight Lifters.....35%
Reiher's, list Feb. 20, 1891
Bronzed Iron Rods.....60@60&10%
Brass, Real Bronze or Nickel Plate..30%
Excelsior.....50&10&2%
Shaw's.....50&10%
Payson's:
Universal.....60%
Solid Grip.....60&10@60&10&10%
Imperial.....50&10%

Lines—

Cotton and Linen Fish.....50%
Chalk.....60%
Masons' Linen, 84 ft., No. 1, $1.25; No. 2, $1.75; No. 3, $2.25; No. 4,$2.75; No. 5, $3.25.....25%
Cotton Chalk 55%
Samson Cotton, No. 4, $2; No. 4½, $2.50; 10%
Silver Lake, Braided No. 0, $6.00; No. 1, $6.50; No. 2, $7.00; No. 3, $7.50 ℔ gro.....25%
Mason's Linen, No. 3½, $1.50; No. 4, $2.00; No 4½, $2.50.
Mason's Colored Cotton.....45%
Wire Clothes..Nos. 18 19 20
100 ft..... $3.50 $3.00 $2.50
Ventilator Cord, Samson Braided, White or Drab Cotton..℔ doz $7.50..20%
Ossawan Mills, Chalk, Twisted, 60%; Chalk, Soft Braided, 50% Chalk, Braided, 25%.

Links, Open—

Terry's—per gro.:

Nos.....	1	2	3	4
	$6.00	8.00	12.00	16.00

Locks, &c.—

Cabinet—

Eagle, Gaylord Parker and Corbin... } List March, '84, rev. Jan. 1, '85.33⅓&2%
Deitz, Nos. 36 to 39.....40%
Deitz, Nos. 51 to 63.....40&10%
Deitz, Nos. 87 to 96.....30%
Champion Night Latches.....40%
Barnes Mfg. Co.....40@40&10%
Eagle and Corbin Trunk.....25&10
Champion Cab. and Combin.....33⅓&
Yale..... .....net prices
Romer's. 25

Door, Locks, Latches, &c.—

R. & E. Mfg. Co., list Mar.20, 1889..... } 65&10@70% Much lower net prices often made
Mallory, Wheeler & Co., list July, '88.....
Sargent & Co., List Aug.1,'88
Branford Lock Works .....

Brittan, Graham & Mathes, list Jan. 1890.....60&10&10%
Plate.....33⅓&2%
Barnes Mfg. Co.....40@40&10%
Yale.....net prices
Deitz Flat Key.....30%
Romer's Night Latches.....15%
Brooklyn Latches.....50&10%
Warner's Burglar Proof, ₩ doz. $8.00, 50%

Elevator—

Moore's.....33⅓%

Padlocks—

List June 10, 1891.....50&2%
Norwich Lock Mfg. Co., old list....50&2%
Yale Lock Mfg. Co.'s.....net prices
Eagle.....40%
Eureka, Eagle Lock Co.....40&2%
Romer's Nos. 0 to 91.....30%
Romer's Scandinavian, &c., Nos. 100 to 505.....15%
A. E. Deitz.....40%
Champion Padlocks.....40%
Hotchkiss.....30%
Star.....60%
Horseshoe.....₩ doz $9. 50&50&10%
Barnes Mfg. Co.....40@40&10%
Nock's.....30%
Scandinavian.....90&40%
E. T. Fraim's Keystone Scandinavian, Nos. 119, 120, 130 and 140.....90&10%
Other Nos.....65%
Ames Sword Co. up to No. 150.....40%
Ames Sword Co. above No. 150.....50%
Slaymaker, Barry & Co.
No. 1010 line.....90&5%
No. 41 line.....50%
No. 61 line.....60%
No. 21 line.....80%

Sash, &c.—

Clark's No. 1, $10; No. 2, $8 ₩ gr.....33⅓%
Ferguson's.....33⅓%
Victor.....60&10&2%
Walker's.....10%
Attwell Mfg. Co.....25&33⅓%
Reading.....66⅔&10@66⅔&10&10%
Hammond's Window Springs.....40%
Common Sense, Jap'd, Cop'd and Br'zed.....₩ gr $4.00
Common Sense, Nickel Plated. ₩ gr $10.00
Universal.....30%
Kempshall's Gravity.....60%
Kempshall's Model.....60@60&10%
Corbin's Daisy, list Feb. 15, 1886.....70%
Payson's Perfect.....60&10&10%
Hugunin's Sash Balances.....25&5&2%
Hugunin's New Sash Locks.....25&5&2%
Ives Patent.....60&10&5@60&10&10%
Fish (Liesche's pat.), No. 100, ₩ gr., $8; No. 105, ₩ gr., $10.....50%
Davis, Bronze, Barnes Mfg. Co.....60%
Champion Safety list January, 1893.70&5%
Security.....70%
Giant, list Jan., 1892.....70&5%
Wolcott's.....60&10&5%
Monarch.....50%

Lumber Tools—

See *Tools, Lumber.*

Lustro—

Four-ounce bottles.....₩ doz, $1.75; ₩ gross.....$17.00

Machines.

Boring—

	Without Augers.	Upright.	Angular.	
Douglas	$5.50	$6.75		50%
Snell's, Rice's Pat...	5.50	6.75.40&10&10%		
Jennings'	5.50	6.75.45@45&10%		
Other Machines..	2.25	2.75		
Phillips' Patent with Augur	7.00	7.50		
Miller's Falls	7.50			25%

Fluting—

Knox, 4¼-inch Rolls.....$3.25 each } 35%
Knox, 6-inch Rolls.....$3.60 each }
Eagle, 3½-inch Rolls, $2.15.....35%
Eagle, 5½-inch Rolls, $2.85.....35%
Crown, 4½ in., $3.50; 6 in., $4.00; 8 in., $6.50 each.....35%
Crown Jewel, 6 in.....$3.50 each, 35%
American, 5 in., $3.00; 6 in., $3.40; 7 in., $4.50 each.....35%
Domestic Fluter.....each, $1.50
Geneva Hand Fluter, White Metal, ₩ doz $12, 25%
Crown Hand Fluter, Nos. 1, $15.00; 2, $12.50; 3, $10.00; 4, $8.25.....30%
Shepard Hand Fluter, No. 85, per doz $15.50.....40%
Shepard Hand Fluter, No. 110, ₩ doz $11.00.....40%
Shepard Hand Fluter No. 95, ₩ doz $8.00.....40%
Combined Fluter and Sad Iron. ₩ doz $15.00.....30%

Hoisting—

Moore's Hand Hoist, with Lock Brake.20%
Moore's Anti-Friction Differential Pulley Block.....20%
Moore's Rope Differential Pulley Block.....60%
Energy Mfg. Co.'s.....25%
See also *Blocks.*

Washing—

Anthony Wayne, ₩ doz, No. 1, $42; No. 2, $36; No. 3, $42.
Wayne American.....₩ doz $36.00
Western Star ₩ doz, No. 2, $36; No. 3 $39.
Weisell.....₩ doz $54.00
Fair and Square.....₩ doz $42.00

Mallets—

Hickory.....20&10@20&10&10%
Lignumvitæ.....20&10@20&10&10%
B. & L. Block Co., Hickory & L. V. 30@30&10

Mattocks—Regular list. 60&10@60&10&5%

Measures—

Standard Fiberware, No. 1, peck ₩ dozen, $3.60; ¼-peck, $3.00

Meat Cutters—

See *Cutters, Meat.*

Menders, Harness—

Per doz.....$2.00

Milk Cans—See *Cans, Milk.*

Mills—

Coffee—

Box and Side, List, Jan. 1, 1883..60@60&5%
Net prices are often made which are lower than above discount.
American, Enterprise Mfg. Co., list Jan. 17, 1893.....20%
The Swift Lane Bros.....30%
Waddell's New Box Mills, Ideal Brand, New List.....60%

Mincing Knives—

See *Knives, Mincing.*

Molasses Gates—

See *Gates, Molasses.*

Money Drawers—

See *Drawers, Money.*

Mowers, Lawn—

Best Machines: 10-in., $4; 12-in., $4.50; 14-in., $5; 16 in., $5.50; 18-in., $6.
Low-Grade Machines: 10-in. $3; 12-in., $3.25 14-in., $3.50 each

Muzzles—

Safety.....₩ doz, $3.00, 25%

Nails.—

Cut and Wire. See Trade Report.
Wire Nails, Papered. Association list, May 1, '92.80&10&10&5%
Tack Mfrs.' list.....70&5@70&10%
Hungarian, Finishing, Upholsterers', &c. See *Tacks.*

Horse—

	Nos. 6	7	8	9	10	
American	8¾	8¾	8¾	8¾	8¾	net
Ausable	28¢	26¢	25¢	24¢	23¢	40&10&2%
Clinton, Fin.	19¢	17¢	16¢	15¢	14¢	.30&10%
Essex	28¢	26¢	25¢	24¢	23¢	40&10&5@50&5%
Lyra	19¢	17¢	16¢	15¢	14¢	.40&10%
Snowden	19¢	17¢	16¢	15¢	14¢	.40&10%
Vulcan	23¢	21¢	20¢	19¢	18¢	...25%
Northwest'n.	25¢	23¢	22¢	21¢	20¢	25@25&5%
A. C.	25¢	23¢	22¢	21¢	21¢	25&10@33⅓&5%
C. B. K.	25¢	23¢	22¢	21¢	21¢	33⅓@33⅓&10%
Maud S.	25¢	23¢	22¢	21¢	21¢	40&10&5%
Champlain	28¢	26¢	25¢	24¢	23¢	40&5&5&2%
Saranac	23¢	21¢	20¢	19¢	18¢	...40&5%
Champion	25¢	23¢	22¢	21¢	20¢	10&10&10%
Capewell	19¢	18¢	17¢	16¢	16¢	...10&5%
Anchor	23¢	21¢	20¢	19¢	18¢	.....35%
Western	23¢	21¢	20¢	19¢	18¢	.....50%
Empire Bronzed						.....13@14 ₩ ℔

Picture—

Brass Head, Sargent's list.....60@60&10%
Brass Head, Combination list.....50&10%
Porcelain Head, Sargent's list.50&10&10%
Porcelain Head, Combination list.40&10%
Niles' Patent.....40%

Nail Pullers—See *Pullers, Nail.*

Nail Sets—See *Sets, Nail.*

Nut Crackers—

See *Crackers, Nut.*

Nuts—List Dec. 18, 1889.

	Square.	Hex.
Hot Pressed	5.80¢	6.50¢ off list
Cold Punched	5.00¢	5.10¢ off list

In packages of 100 ℔, add 1-10¢ ₩ ℔, net; in packages less than 100 ℔, add ½¢ ₩ ℔, net.

Oakum—

Best or Government. . ....₩ ℔ 6¾@7¼¢
U. S. Navy.....₩ ℔ 5¾@6¢
Navy.....₩ ℔ 5¢@5¼¢

Oil Tanks—See *Tanks, Oil.*

Oilers—

Zinc and Tin.....65&10@70&5%
Brass and Copper.....50&10@50&10&5%
Malleable, Hammers' Improved, No. 1, $3.60; No. 2, $4.00; No. 3, $4.40 ₩ doz. 10@10&5%
Malleable, Hammers' Old Pattern, same list.....45%
Prior's Pat. or "Paragon" Zinc. 60&10&10%
Prior's Pat. or "Paragon" Brass.....50%
Olmstead's Tin and Zinc.....60%
Olmstead's Brass and Copper.....50%
Broughton's Zinc.....60%
Broughton's Brass.....50%
Steel, Draper & Williams.....50%

Openers, Can—

Messenger's Comet.....₩ doz $3.00, 25%
American.....₩ gross $2.75@$3.00
Duplex.....₩ doz 25¢, 15@20%
Lyman's.....₩ doz $3.75, 20%
No. 4, French.....₩ doz $2.25, 55@60%
No. 5, Iron Handle.....₩ gr $6.00, 45@50%
Eureka.....₩ doz $2.50, 10%
Sardine Scissors.....₩ doz $2.75@3.00
Star.....₩ doz $2.75
Sprague, No. 1, $2.00; 2, $2.25; 3, $2.50; 66⅔@70%
Excelsior, No. 1 $2.50; No. 2, $1.50.....40%
World's Best ₩ gross, No. 1, $12.00; No. 2, $24.00; No. 3, $36.00.....50&10%
Universal, ₩ doz $3.00.....55&5%
Domestic, ₩ doz $2.00.....45%
Champion, ₩ doz $2.00.....50%
Moore's.....70%

Packing, Steam—

Rubber—

Standard.....70@70&10%
Extra.....60@60&5%
N. Y. B. & P. Co., Standard.....50%
N. Y. B. & P. Co., Empire.....60%
N. Y. B. & P. Co., Salamander.....25%
Jenkins' Standard, ₩ ℔ 80¢.....25@25&5%

Miscellaneous—

American Packing.....10¢@11¢ ₩ ℔
Russia Packing.....14¢ ₩ ℔
Italian Packing.....13¢@14¢ ₩ ℔
Cotton Packing.....15¢@17¢ ₩ ℔
Jute.....7¢@8¢ ₩ ℔

Pails—

Creamery—

S. S. & Co.: 18-qt., $7.00; 20-qt., $7.25 per doz.....5%

Galvanized—

	Quarts	10	12	14
Hill's Light Weight, ₩ doz.	$2.75	3.00	3.25	
Hill's Heavy Weight, ₩ dz.	3.00	3.25	3.75	
Helwig's	2.50	2.75	3.00	
Sidney Shepard & Co.	2.50	2.75	3.00	
Iron Clad	2.50	2.75	3.00	
Fire Buckets	2.75	3.25	3.50	

Buckets—See Well Buckets.

Indurated Fiber Ware—25%

Star Pails, 12 qt.....₩ doz $4.20
Milk, 14 qt.....₩ doz $5.40
Stable, 14 qt.....₩ doz $6 00
Fire Pails, deep.....₩ doz $4.80
Fire Pails, round bottom.....₩ doz $5.40

Standard Fiber Ware—

	Plain.	Deer'd
Water Pails, 12 qt., ₩ doz.	$3.60	$4.00
Dairy Pails, 14 qt., ₩ doz.	4.00	4.50
Fire Pails, No. 1, 12 qt., ₩ doz	4.00	
Fire Pails, No. 2, 14 qt., ₩ doz	4.50	
Sugar Pails	5.50	6.00
Horse Pails	4.50	
Buggy Pails	3.50	
Slop Jars (bal. trap)	7.50	8.50
Chamber Pails, 14 qt.	6.00	7.00

Pans—

Dripping—

Small sizes.....₩ ℔ 5½¢
Large sizes.....₩ ℔ 5¢
Silver & Co. (Covered).....40%

Fry—

Standard List: No.	0	1	2	3	4
₩ doz.	$3.00	$3.75	$4.25	4.75	$5.25
No.		5	6	7	8
₩ doz.		$6.00	$7.00	$8.00	$9.00

Polished, regular goods.....75@75&10%
Acme Fry Pans.....66⅔%

Dust—

Steel Edge, No. 1.....₩ doz $1.75

Roasting and Baking—

Columbia, S. S. & Co.: Nos. 10, $2; 20, $2.25; 30, $2.50 each.....60&10%

Paper and Cloth—

Sand and Emery—

List April 19, 1886.... 50&10&50&10&10%
Sibley's Emery and Crocus Cloth.....30%

Parers—

Apple—

Advance.....₩ doz $4.75
Baldwin.....₩ doz 5.25
Bonanza.....each 5.00
Daisy.....₩ doz 4.00
Dandy.....each 7.50
Eclipse.....₩ doz 4.25
Eureka, 1888.....each 16.00
Family Bay State.....₩ doz 12.00
Favorite.....₩ doz 5.00
Gold Medal.....₩ doz 4.00
Ideal.....₩ doz 4.00
Improved Bay State....₩ doz 27.00@30.00
Little Star.....₩ doz 4.50
Monarch.....₩ doz 13.50
New Lightning.....₩ doz 5.50
Oriole.....₩ doz 4.00
Penn.....₩ doz 4.00
Perfection.....₩ doz 4.00
Pomona.....₩ doz 4.00
Rocking Table.....₩ doz 6.00
Turn Table.....₩ doz 4.50
Victor.....₩ doz 13.50
Waverly.....₩ doz 4.00
White Mountain.....₩ doz 4.00
72.....₩ doz 4.25
78.....₩ doz 7.00

Potato—

White Mountain.....₩ doz $4.50
Antrim Combination.....₩ doz $5.50
Hoosier.....₩ doz $13.50
Saratoga.....₩ doz $5.50

Pencils—

Faber's Carpenters'.....high list 50%
Faber's Round Gilt.....₩ gro $5.25
Dixon's Lead.....₩ gro $4.50
Dixon's Lumber.....₩ gro $6.75
Dixon's Carpenters'.....10%

Pencils, Soapstone—

See *Crayons.*

Pickers, Fruit—

Prize Fruit Pickers.....50%

Picks—

Railroad or Adze Eye, 5 to 6, $12.00; 6 to 7, $13.00.....60&10@60&10&10%

Picture Nails—

See *Nails, Picture.*

Pinking Irons—

See *Irons, Pinking.*

Pins—

Bow—

Humason, Beckley & Co.'s.....60&10%
Sargent & Co.'s, $17 and $18.....60&10%
Peck, Stow & W. Co....60&10&50&10&5%

Curtain—

Silvered Glass.....net
White Enamel.....net

Escutcheon—

Iron, list Nov. 11, 1885..50&10&50&10&5%
Brass.....60@60&5%

Pipe, Wrought Iron—

List April 13, 1893.

1¼ and under, Plain.....57½&10%
1¼ and under, Galv.....50&10%
1½ and over, Plain.....67½&10%
1½ and over, Galv.....57½&10%
Boiler Tubes, list Oct. 24, 1892.....65&10%
Casing, list Nov. 16, 1892.....52½&10%
Inserted Joints Casing, list Nov. 16, 1892.....47½&5%
Steel Boiler Tubes.....27½&5%
Cold Drawn Seamless Steel Tubing..50%

Planes and Plane Irons—

Wood Planes—

Molding.....40@40&10%
Bench, First quality.....45@45&10%
Bench, Second quality.....50@50&10%
Bailey's (Stanley R. & L. Co.) ..50&10%

Iron Planes—

Bailey's (Stanley R. & L. Co.).....50&10%
Miscellaneous Planes (Stanley R. & L. Co.).....25&10%
Steers' Iron Planes.....50@50&5%
Meriden Mal. Iron Co.'s.....50@50&5%
Davis' Iron Planes.....50@50&5%
Birmingham Plane Co.....60@60&5%
Gage Tool Co.'s Self-Setting...20&10&10%
Chaplin's Iron Planes.....50@50&5%
Sargent's.....60@60&10%
Standard Tool Co....50@50&5%

Plane Irons—

Butcher's.....$5.00@$5.25 to a
Buck Bros.....30%
Auburn Thistle, Ohio, Sandusky.....30&10%
L. & I. J. White.....25%
Stanley R. & L. Co.....50&10%

Plates—

Felloe.....₩ ℔ 6¢@6½¢

Pliers and Nippers—

Button's Patent.....60%
Hall's No. 2, 5 in., $13.50; No. 4, 7 in., $21.00 ₩ doz.....40%
Humason & Beckley Mfg. Co..50@50&10%
Lindsay's Giant.....33⅓%
Gas Pliers.....60%
Gas Pliers, Custar's Nickel Plated..60&5%
Eureka Pliers and Nippers.....40%
Russell's Parallel.....25%
P., S. & W. Cast Steel.....50%
P., S. & W. Tinners' Cutting Nippers, add 6%.....10%
Carew's Pat. Wire Cutters.....20%
Morrill's Parallel, ₩ doz, $12.00....30&5%
Cronk's 8 in., $15.00; 10 in.....$20
Cronk's Button Pattern.....50&10@60%
Cronk's Carrier Pliers.....60@60&5%

Plumbs and Levels—

Regular List.....75&10@75&10&5%
Stanley's Duplex.....20&10%
Stanley's Handy.....20&10%
Disston's.....50%
Cook's.....40&10%
Pocket Levels.....70&10@70&10&10%
Davis Iron Levels.....40&10%

Poachers, Egg—

Buffalo Steam Egg Poachers, ₩ doz, No. 1, $6.00; No. 2, $9.00.....33⅓%
Silver & Co., 6-Ring, ₩ doz, $4.00; 8-Ring.....$3.00

Pokes, Animal—

Bishop s I. X. L.....₩ doz $6.00
Bishop's Monarch.....₩ doz $4.50
Bishop's Pioneer.....₩ doz $4.00
Bishop's American.....₩ doz $3.00
Eagle, Double Stale.....₩ doz $5.75
Eagle, Single Stale.....₩ doz $3.75
Buckeye, Single Stale.....₩ doz $2.75
Bolding.....₩ doz $6.00
Metallic Horse Poke.....₩ doz., $6.00

Police Goods—

R. I. Tool Co., Handcuffs, $15.00 ₩ doz 10%
R. I. Tool Co., Leg Irons, $25.00 ₩ doz 10%
Tower's.....25%
Daley's Improved Handcuffs; 2 Hands, Polished, ₩ doz, $48.00; Nickeled, $57.00; 3 hands, Polished, ₩ doz, $72.00; Nickeled, $84.00.....25%
J. P. Lovell's Police Goods.....25%

Polish—

Metal—

Prestoline.....30%
Prestoline Paste.....33⅓%
Gaston's Silver Compound.....33⅓%

Stove—

Joseph Dixon's.....₩ gro, $6.00, 10%
Gem.....₩ gro, $4.50, 10%
Gold Medal.....₩ gro, $6.00, 25%
Lustro.....₩ gro, $4.75
Ruby.....₩ gro, $3.75
Rising Sun, 5 gro lots.....₩ gro $5.50
Dixon's Plumbago.....₩ ℔ 8¢
Boynton's Noon Day.....₩ gro $13.00
Parlor Pride Stove Enamel, ₩ gro
Yates' Liquid, 2 3 5 10 gal ₩ gal...$0.80 .70 .60 .50
Yates Standard Paste Polish, 10 ℔ cans, ₩ ℔ 12½¢
Jet Black.....₩ gro $3.50
Japanese.....₩ gro $3.50
Fireside.....₩ gro $2.50
Diamond O. K. Enamel.....₩ gro $19.00
Bonnell's Liquid Stove Polish, ₩ gro $9.00
Bonnell's Paste Stove Polish, ₩ gro $6.00
Black Eagle Benzine Paste, 5 and 10 ℔ cans.....12½¢
Black Jack Water Paste, 5 and 10 ℔ cans.....12½¢
Nickel Plate Paste.....₩ gro $6.00
Crown Paste.....₩ gro $7.20
Crown Paste in 5 and 10 ℔ pails, ₩ ℔ 12¢
Black Flag.....₩ gro $7.20
Black Flag, 5 and 10 ℔ pails.....₩ ℔ 12¢
Black Flag, liquid, in bottles, ₩ gro $8.00
Diamond Rock Nickel Cleaner. ₩ gro $10.80
Raven Liquid, 6 oz. bottles. ₩ gro $8.00
Raven Liquid, 8 oz. bottles. ₩ gro $9.00
Raven Water Polish, large boxes. ₩ gro $7.20
Raven Paste (6 pails), ₩ ℔.....10¢

Poppers, Corn—

Round or Square,
1 qt.....₩ doz $1.00; ₩ gr $8.00
1½ qt.....₩ doz $1.00; ₩ gr $9.00
2 qt.....₩ doz $1.50; ₩ gr $14.00

Post Hole and Tree Augers and Diggers—

See *Diggers, Post Hole, &c.*

Potato Parers—

See *Parers, Potato.*

Pots—

Glue—

Tinned.....40&10@40&10&5%
Enameled.....40&10@40&10&5%
Family, Howe's "Eureka".....40%
Family, L. F. C.'s "Handy".....40%

Powder—

In Canisters—

Fine Sporting, 1 ℔ each	0.90
Duck, 1 ℔ each	.60
Rifle, 1 ℔ each	.30
Rifle, ½ ℔ each	.18

In Kegs—

Rifle, 25-℔ kegs	$3.50
Rifle, 12½-℔ kegs	2.00
Rifle, 6¼-℔ kegs	1.15
Duck, 25-℔ kegs	11.00
Duck, 12½-℔ kegs	5.75
Duck 6¼ ℔ kegs	3.00

Presses—

Fruit and Jelly—

Enterprise Mfg. Co.....25%
Tenis.....₩ doz $3.50
Shepard's Queen City.....40%
Silver & Co.....₩ doz $2.75

Pruning Hooks and Shears—See *Shears.*

Pullers, Nail—

Scranton.. ..... ₩ doz., $18.00, 33⅓%
Curtis Hammer..... ₩ doz., $9.00
Giant, No. 1..... ₩ doz., $18.00, 10%
Giant, No. 2..... ₩ doz., $15.00, 10%
Pelican..... ₩ doz., $9.00, 25%
Eclipse..... Each, $2.00, net
Economy..... ₩ doz., $6.00

Pulleys—

Hot House, Awning, &c.....66⅔&@70%
Japanned Screw.....60&10&10%
Brass Screw.....70%
Japanned Side.....60&10&10%
Moore's Side, Anti Friction.....50%
Moore's Ceiling or End, Anti Friction 40%
Moore's Dumb Waiter, Anti-Friction 50%
Moore's Electric Light.....33⅓%
Japanned Clothes Line.....60&10%
Hay Fork, Solid Eye, $4.00; Swivel, $4.50.....50&10&50&10&5%
Hay Fork, "Anti-Friction," 5 in. solid, $5.70.....50%
Hay Fork, "F" Common and Patent Bushed.....20%
Hay Fork, Tarbox Pat. Iron.....20%
Hay Fork, Reed's Self-Lubricating....60%
Hay Fork, Moore's Anti-Friction 5 in. Wheel, ₩ doz., $12.00.....40%
Shade Rack.....45%
Tackle Blocks—See Blocks.
Shepard's Niagara, No. 25..₩ doz 23¢ net
Sash (Auger Mortise).
Common Sense.....60%
Empire.....60%
Ideal, Nos. 2, 4, 10 & 15 / Acme..... / Star..... } 30% less 1¢ ₩ doz net.
On bbl. lots extra 5%.
Ideal, Nos. 25 and 55. ..₩ doz. 22¢ net.

Pumps—

Cistern, Best Makers..... .60@60&10%
Pitcher Spout, Best Makers.....67½@70%
Pitcher Spout, Cheaper G'ds..75@75&10%

Punches—

Saddler's or Drive, good..₩ doz., 60@65%
Bemis & Call Co.'s Cast Steel Drive.50&5%
Bemis & Call Co.'s Springfield Socket..65%
Spring, good quality..₩ doz., $2.50@$2.60
Spring, Leach's Pat.....15%
Bemis & Call Co.'s Spring.....60&5%
Bemis & Call Co.'s Check.....55%
Solid Tinners', P., S. & W. Co., ₩ doz., $1.44.....55%
Tinners' Hollow Punches, P., S. & W. Co.....20&2%
Rice Hand Punches.....15%
Avery's Revolving.....40%
Avery's Sawset and Punch—See Sawsets
Niagara Hollow Punches.....20&2%
Niagara Solid Punches.....55%

Rail—

Sliding Door, Wr't Brass....₩ ℔, 35¢, 40%
Sliding Door, Bronzed Wr't Iron..₩ ft., 7¢
Sliding Door, Iron, Painted..₩ ft., 4¢, 40%
Barn Door, Light..In. ½ ⅝ ¾
Per 100 feet.....$2.00 2.50 3.10, 10%
B. D. for N. E. Hangers—
Small. Med. Large.
Per 100 feet.....$3.15 2.70 3.25 Net
Terry's Steel Rail.....₩ ft., 4½¢
Victor Track Rail, 7¢ ₩ foot.....50&2%
Carrier, double braced, Steel Rail, ₩ foot.....3½@4¢
Lundy Parlor Door, Planed Edge, ₩ ft.7¢
Moore's Steel Rail.....25&10%
Moody Steel Rail ₩ ft., 5¢..... .....45%

Rakes—

Cast Steel, Association g'ds..70@70&5&2%
Cast Steel, outside g'ds,.....70@70&5&2%
Malleable.....70@70&5%
Gibbs' Lawn Rake.....₩ doz., $4.90
Gibbs' Canton Lawn Rake...₩ doz., $3.75
Gibbs' Acme Lawn Rake....₩ doz., $4.75
Gibbs' Favorite Lawn Rake.₩ doz., $3.90
Gibbs' Crown Lawn Rake, No. 1..... ₩ doz., $4.90; No. 2, $5.40
Oneida Lawn Rake ..... ₩ doz., $6.00
Fort Madison Prize Bow Brace and Peerless.....65%
Fort Madison Steel Tooth Lawn Rake, $6.00.....25%

Razors—

J. R. Torrey Razor Co.....20%
Wostenholm and Butcher, $10 to £....10%
Jordan's AAA1, new list..... .....Net
Jordan's Old Faithful, new list.....Net
Galvanic..... ₩ doz., $15.00
Electric Cutlery Co..... .....Net
Campbell Cutlery Co..... .....50%

Razor Strops—

See *Strops, Razor.*

Registers —

Moore's Japanned.....75%
Moore's Electroplated..... .....75%
Moore's Bronze Finishes..... .....70%
Moore's Solid Bronze 86⅔
Moore's Stove Pipe... .....33⅓

Rings and Ringers—

Bull Rings—

Union Nut Co.....55%
Sargent's.....75&10%
Hotchkiss' low list.....30%
Humason, Beckley & Co.'s.....70&10%
Peck, Stow & W. Co.'s..50&10@50&10&10%
Ellrich Hdw. Co., White Metal, low list. 50@50&10%

Hog—

Top of the Hill Ringers.....₩ doz $2.00
Top of the Hill Rings.....₩ doz $1.25
Hill's Improved Ringers.....₩ doz $1.25
Hill's Old Style Ringers.....₩ doz $1.12½
Hill's Tongs.....₩ doz $3.00
Hill's Rings.....₩ doz bxs $1.00
Perfect Rings.....₩ doz bxs $1.50
Perfect Ringers.....₩ doz $2.15@$2.25
Blair's Hog Ringers.....₩ doz $2.00
Blair's Hog Rings.....₩ doz 90¢@$1.00
Champion Ringers.....₩ doz $2.00
Champion Rings, Double.....₩ doz $2.25
Brown's Ringers.....₩ doz $2.00
Brown's Rings.....₩ doz $1.15@$1.25
Electric Hog Rings.....₩ doz boxes $1.50
Electric Hog Ringers.....₩ doz $2.00
Major Rings.....₩ doz $1.25
Major Ringers.....₩ doz $2.00

Rivets and Burrs—

Norway Iron list Nov. 17, '87....60&10%
Second quality.....70%
Copper .....60@60&10%
Coppered Iron, Bettina Brand.....50&5%

Rivet Sets—See *Sets.*

Roasting and Baking Pans—See *Pans, Roasting and Baking.*

Rods—

Stair, Brass.....25@30%
Stair, Black Walnut..... .. ₩ doz 40¢

Rollers—

Barn Door, Sargent's list. ....60&10&10%
Acme Moore's Anti-Friction.....55%
Union Barn Door Roller.... . .....70%
Moore's Barn Door Stay 50
Thompson Mfg. Co.'s Lawn Rollers ..30%

Rope—The following prices are f.o.b., New York or factory, and are shaded ¼¢@½¢ on large lots; terms, 1½% for cash.

Manila, 7-16 in. diam. and larger₩ ℔ 9½¢
Manila.....⅜ in. ₩ ℔ 10 ¢
Manila.....¼ and 5-16 in. ₩ ℔ 10½¢
Manila, Tarred Rope..... ₩ ℔ 9 ¢
Manila, Hay Rope ..... ₩ ℔ 9 ¢
Sisal.....7-16 inch and larger ₩ ℔ 7¾¢
Sisal.....⅜ in. ₩ ℔ 8¼¢
Sisal.....¼ and 5-16 in. ₩ ℔ 8¾¢
Sisal, Hay Rope..... ₩ ℔ 7¾¢
Sisal, Tarred Rope..... ₩ ℔ 7¼¢
Sisal, Medium Lath Yarn..... ₩ ℔ 7¼¢
New Zealand..7-16 in. & larger ₩ ℔ 7¼¢
New Zealand.....⅜ inch, ₩ ℔ 7¾¢
New Zealand..¼ and 5-16 inch, ₩ ℔ 8¼¢
New Zealand, Hay Rope..... ₩ ℔ 7¼¢
New Zealand, Tarred Rope.... ₩ ℔ 6¾¢
Cotton Rope..... ₩ ℔ 13½@16¢
Jute Rope..... ....₩ ℔ 6½@7¢

Wire—

List February, 1892. All kinds.....45%

Rules—

Boxwood.....80&10&10@80&10&10&10%
Ivory.....50&10%
Starrett's Steel Rules and Straight Edges.....25&10%

Sad Irons—See *Irons, Sad.*

Sand and Emery Paper and Cloth—

See *Paper and Cloth.*

Sash Cord—See *Cord, Sash.*

Sash Locks—*See Locks, Sash.*

Sash Weights—

See *Weights, Sash.*

Sausage Stuffers or Fillers—See *Stuffers or Fillers, Sausage.*

Saws—

Disston's Circular.....45@45&5%
Disston's Cross Cut, list Jan. 1,'93.40&10%
Disston's Hand 25%
Woodrough & McParlin.
Hand, Panel and Rip.....25&10%
Cross Cuts, list Jan. 1, 1893.....45&10%
Wheeler, Madden & Clemson Mfg. Co.
Hand, Panel and Rip.....30&10%
Cross Cuts, list Jan. 1, 1893.....45&10%
Atkins' Circular..... .....60&10%
Atkins' Cross Cuts, new list. 40%
Atkins' Mulay, Mill and Drag.....50&10%
Atkins' One-Man Saw.....40%
Atkins' Wood Saws..... .....40%
Peace Circular and Mill.....45@45&5%
Peace Hand Panel and Rip.....25@25&5%
Peace Cross Cuts, list Jan. 1,'93...45&10%
Richardson's Circular and Mill.45@45&5%
Richardson's X Cuts, list Jan. 1,'93.45&10%
Richardson's Hand, &c .....25@25&5%
C E. Jennings & Co.'s brand.. . ....25%

Hack Saws—

Griffin's, complete.....40&10@50
Griffin's Hack Saw Blades.....40&10@50
Star Hack Saws and Blades.....25%
Eureka and Crescent.....25%

Scroll—

Lester, complete, $10.00..... .....25%
Rogers, complete, $4.00..... .....25%
Barnes' Builders' and Cab Makers'$15,25%
Barnes' Scroll Saw Blades.....35%

Saw Frames—

See *Frames, Saw.*

Saw Sets—See *Sets, Saw.*

Saw Tools—See *Tools, Saw.*

Scales—

Hatch, Counter, No. 171, good quality, ₩ doz $18.00@$19.00
Hatch, Tea, No. 161....₩ doz $6.50@$7.00
Union Platform, Plain.....$2.10@2.20
Union Platform, Striped.....$2.40@2.50
Chatillon's Grocers' Trip Scales.....50%
Chatillon's Eureka.....25%
Chatillon's Favorite.....40%
Family, Turnbulls.....30@30&10
Riehle Bros.' Platform.....40%

Scale Beams—

See *Beams, Scale.*

Scissors, Fluting.....45%

Scrapers—

Adjustable Box Scraper (S. R. & L. Co.) $6.00.....30&10%
Box, 1 Handle.....₩ doz $2.25@$2.50
Box, 2 Handle.....₩ doz $3.00@$3.25
Defiance Box and Ship..... .....20&10%
Foot.....50&10&60%
Ship, Common..... ....₩ doz $3.50 net
Ship, R. I. Tool Co.....10%

Screen Window and Door Frames—See *Frames*

Screw Drivers—

See *Drivers, Screw*

Screws—

Bench and Hand—

Bench, Iron.....55&10@55&10&10%
Bench, Wood, Beech..... .....₩ doz $2.25
Bench, Wood, Hickory.....20&10%
Hand, Wood..... .....25&10@25&10&5%
Hand, Grand Rapids, list.....35%

Coach, Lag and Hand-Rail—

Lag, Blunt Point, list Jan. 1, 1890..... 80@80&10%
Coach and Lag, Gimlet Point, list Jan. 1, 1890.....80@80&5%
Hand Rail, Sargent's.....70&10%
Hand Rail, H. & B. Mfg. Co....70&10@75%
Hand Rail, Am. Screw Co.....75%

Jack Screws—

Jack Screws, Millers Falls list.50@50&10%
Jack Screws, P., S. & W.....35%
Jack Screws, Sargent.....70%
Jack Screws, Stearns'.....40@40&10%

Cork—

Humason & Beckley Mfg. Co..40&10@50%
Williamson's.....33⅓@33⅓&5%
Detroit Cork Screw Co.....33⅓%

Machine—

Flat Head Iron.....65%
Round Head Iron.....60%

Wood—

List January 1, 1891.
Flat Head Iron.....70%
Round Head Iron.....65%
Flat Head Brass.....70%
Round Head Brass.....65%
Flat Head Bronze.....70%
Round Head, Bronze: ...65%
Rogers' Drive Screws.....82½%
} Extra 10 or 10& 10%often given.

Scroll Saws—See *Saws, Scroll.*

Scythes—

Grain.....40&5@40&10%
Grass.....40&10&50%

Scythe Snaths—

See *Snaths, Scythe.*

Sets—

Awl and Tool—

Aiken's Sets, Awls and Tools, No. 20, ₩ doz$10.00..... .....60@60&5%
Fray's Adj. Tool Hdls., Nos. 1, $12; 2, $18; 3, $12; 4, $9..... .....45%
Millers Falls Adj. Tool Hdls., Nos. 1, $12; 2, $18.....25%
Henry's Combination Haft...₩ doz $6.50
Stanley's Excelsior: No. 1, $7.50; No. 2, $4.00; No. 3, $5.50.....30&10%
Common Brad Sets, No. 42, $10.50; No. 43, $12.50...70&10&5%

Nail—

Square.....₩ gr. $4.00@$4.25
Round.....₩ gr. $3.25
Buck Bros.....27½%
Cannon's Diamond Point...₩ gr. $12, 20%

Rivet—

Regular list.....70%

Saw—

Stillman's Genuine....₩ doz $5.00@7.75, 40&5%
Stillman's Pattern, Hand, ₩ doz $3.25; Cross Cut, $6.50.....55@55&10%
Common Lever.....₩ doz $2.00, 45@50%
Morrill's No. 1, $14.00.....40&20%
No. 11, $15.50.....40&20%
Nos. 3 and 4, Cross Cut, $22.50..40&20%
No. 5, Mill, $30.00.....40&20%
No. 10, $15.00.....40&20%
Leach's..No. 0, $8.00; No. 1, $15...15@20%
Nash's.....20&10@20&10&10
Hammer, Hotchkiss.....$5.50, 10%
Hammer, Bemis & Call Co.'s new Pat.45%
Bemis & Call Spring Hammer..... 30&5%
Bemis & Call Co.'s Plate.....20%
Bemis & Call Co.'s Cross Cut.....30&5%
Aiken's Genuine.....$13.00, 55@55&10%
Aiken's Imitation.....$9.00, 55@55&10%
Hart's Pat. Lever.....20%
Disston's Star..... .....25%
Leopold..... .....40&10@50%
Atkin's Lever.....₩ doz No. 1, $6.00
Atkin's Criterion.....₩ doz No. 1, $6.00
Croissant (Keller), No. 1, $15.00; No. 2, $24.00.....40&10@50%
Avery's Saw Set and Punch.....50%
Kohler's Royal.....₩ doz $7.00
Kohler's Giant Royal.....₩ doz $12.00
Crescent.....₩ doz $3.00
Lloyd's Acme.....₩ doz $15, 40&10%
Taintor Positive.....₩ doz $18, 50%

Sharpeners, Knife—

Larkins'.
Applewood Handles...₩ doz. $6.00, 40%
Rosewood or Cocobola. ₩ doz. $9.00 40%

Shaves, Spoke—

Iron.....45%
Wood.....30%
Bailey's (Stanley R. & L. Co.)....40&10%
Stearns'.....30&10%
Cincinnati.....25&10%
Goodell's ₩ doz. $9.00.....25%

Shears—

American (Cast) Iron..75&10@75&10&5%
Barnard's Lamp Trimmers..₩ doz. $3.75
Seymour's, List Dec. 1881. 60&10&10@60&10&10&5%
Heinisch's, List Dec. 1881. 60&10&10@60&10&10&5
Heinisch's Tailor's Shears.....33⅓%
Cast Steel Trimmers:
First quality..... 80@80&10%
Second quality.....80&10@80&10&10%
Acme Cast Shears.....10&10%
Diamond Cast Shears.....10%
Clipper.....10&10%
Victor Cast Shears.....75&10@75&10&5%
Howe Bros. & Hulbert, Solid Forged Steel.....40%
Hatch Cutlery Co., Solid Steel Forged.60%
Davenport Cutlery Co..... .60@60&10%
Clauss brand, Japanned.....70%
Clauss brand, Nickeled, same list.....60%
Galvanic 3½ to 9 in., ₩ doz. $1.00 ₩ inch
Electric Cutlery Co ..... Net
Campbell Cutlery Co., Jap'd.....75%
Nickel Plated.....65%

Tinners' Snips—

Wrt. Handles, Steel Blades. ..20@20&10%
Niagara Snips and Shears. ...20&10%
Cast Handles, Laid with Steel .. 40%

Pruning Shears and Hook—

Disston's Combined Pruning Hook and Saw..... ₩ doz. $18.00, 20&10%
Disston's Pruning Hook, ₩ doz. $12.00 20&10%
E.S.Lee & Co.'s Pruning Tools.50&10@70%
Pruning Shears, Henry's Pat., ₩ doz. $3.75@$4.00
Henry's Pruning Shears, ₩ doz. $4.25 @$4.5
Wheeler, M. & C. Co., Combination, ₩ doz $12.00
Dunlap's Saw and Chisel, ₩ doz $3.50,30%
J. Mallinson & Co., No. 1, $5.25; No. 2, $7.25
P., S. & W. Co..... .....60%
Levin Pruner No. 1, $15.00 ₩ doz .40&5%
Levin Pruner No. 2, $21.00 ₩ doz...40&5%

Tinners', &c.—

Shears and Snips (P. S. & W.)....20@25%
Snips, J. Mallinson & Co.....33⅓%

Sheaves—

Sliding Door—

M. W. Co., list July 1888....50&10@60&5%
R. & E., list Dec. 18, 1885.....55&20%
Corbin's list.....60&10&2%
Patent Roller.....60&10&5%
Patent Roller, Hatfield's.....75%
Russell's Anti-Friction, list Dec. 18, 1885.....60&2½
Moore's Anti-Friction.....50%

Sliding Shutter—

R. & E., list Dec. 18, 1885.....60&10&2%
Sargent's list..... .....70%
Reading list.....60&10&10%

Shells—

First quality 4, 8, 10 and 12 gauge 25&10&2%
First quality Rival, Club and Climax brands, 14, 16 and 20 gauge ($7.50 list)..... 20&10&2%
Prize.....40&5%
Star, Club, Rival and Climax Brands... 33⅓&10&2%
Smokeless brand, 12, 10, 16 gauge. 33⅓&10&2%
Trap brand, 12 and 10 gauge..33⅓&10&2%
Selbold's Comb. Shot Shells.....15&2%
Brass Shot Shells, 1st quality.....60&2%
Brass Shot Shells, Club, Rival, Climax. 65&2%

Shells, Loaded—

Standard List, July 19, 1890..... 40&10&10@40&10&10&2½

Ship Tools—

L. & I. J. White.....20&2½

Shoes, Horse, Mule, &c.—

Horse—

Burden's, Perkins', Phœnix, Standard. Diamond State, Bryden's Boss and Crescent, at factory.....$4.00
Bryden's Frog Pressure, at factory..$5.00

Mule—

Add $1 ₩ keg to above prices.

Ox Wrought—

Ton lots.....₩ ℔ 9¢
1000 ℔ lots.....₩ ℔ 9½¢
500 ℔ lots.....₩ ℔ 10¢

Shot—

	Small lots.	
Drop, up to B, 25-℔ bag	$1.45	In ton lots a discount of 5¢ ₩ bag (56 ℔) is made.
Drop, up to B, 5-℔ bag	.35	
Drop, B and larger, 25-℔ bag	1.70	
Drop, B and larger, 5-℔ bag	.40	
Buck and Chilled, 25-℔ bag	1.70	
Buck and Chilled, 5-℔ bag	.40	
Dust Shot, 25-℔ bag	2.00	
Dust Shot, 5-℔ bag	.45	

Shovels and Spades—

Ames' Shovels, Spades, &c., list Nov. 1, 1885..... .....30%
NOTE.—Jobbers frequently give 5@7½% extra on above.
Griffith's Black Iron.....50&10%
Griffith's C. S. .....60@60&5%
Griffith's Solid C. S. R. R. Goods.....20%
St. Louis Shovel Co.....20@20&7½%
Hussey, Binns & Co.....15@25%
Hubbard & Co.... .....20@20&7½%
Lehigh Mfg. Co.....50&10%
H. M. Myers Co.....30%
Payne Pettebone & Son.....33⅓&5%
Remington's (Lowman's Pat.)40&10&50%
Rowland's Black Iron..50&10@50&10&5%
Rowland's Steel..... .....60&5&60&10%
Terra Haute Shovel & 25%

Shovels and Tongs—

Iron Head.....60&10@60&10&5%
Brass Head..... .....60&10&10%

Sieves and Sifters—

Mann's Tin Rim..... .....50&35%
Buffalo Metallic, S. S. & Co.....50&25%
Shaker (Barler's Pat.) Flour Sifters ₩ gr $21.00
Electric Light..₩ doz $1.50; ₩ gro $15.00
A. & W. Sifters ..... ₩ gr $15.00
Hunter's Genuine, ₩ doz $1 75, ₩ gr $16.50
Hunter's Imitation..... ₩ doz $1.75; ₩ gr $15.00

Sieves, Wooden Rim—

	Iron	Plated
Mesh 18, Nested, ₩ doz.	$0.80	$1.00
Mesh 20, Nested, ₩ doz.	.95	1.10
Mesh 24, Nested, ₩ doz.	1.15	1.35

Sinks, Wrought Steel—

Columbus, Painted or Unpainted..... 30@30&10%
Columbus, Galvanized and Enameled. 50@50&10%
New Era, Painted.....40&10@50&5%
New Era, Galvanized and Enameled... 60&10&10@70&5%

Skeins, Thimble—

Western list..... .....75&5@75&10%
Columbus Wrt. Steel. Special net prices
Coldbrookdale Iron Co..... .....60%
Seneca Falls Pattern.....60%
Utica P. S. T. Skeins..... ....60%
Utica Turned and Fitted..... .....35%

Slates—

School, by case.....50&10@50&10&10%

Slaw Cutters—See *Cutters.*

Sleds Hand—

Tubular Steel ..... .₩ doz $24.00 40&50
Lots of 6 doz 50%

Snaps, Harness, &c.—
Anchor (T. & S. Mfg. Co.).....65%
Fitch's (Bristol).....50&10%
Hotchkiss.....10%
Andrews.....50%
Sargent's Patent Guarded.....70&10&10%
German, new list.....40&10%
Covert.....50&10&5&2%
Covert, New Patent.....50&10&5&2%
Covert, New R. E.....60&10&5&2%
Covered Spring.....60&10&10%
Covert's Saddlery Works' Triumph 33⅓&5
John Protz Snaps.....75@75&5%
Kelley & Woolworth's Steel Harness.....50&10@60%

Snaths—
Scythe.....50&2@50&5&2%

Soldering Irons—
See *Irons, Soldering.*

Spittoons, Cuspidors, &c.
Standard Fiberware—
Cuspidors, 8½-inch, ₩ doz., No. 5, $8; No. 5X, $9.
Spittoons, Daisy, 8-inch, No. 1, 4; 10 and 11 inch, $6.

Spoke Shaves—
See *Shaves, Spoke.*

Spoke Trimmers—
See *Trimmers, Spoke.*

Spoons and Forks—
Tinned Iron—
Basting, Cen. Stamp. Co.'s list.....70&10%
Solid Table and Tea, Cen. Stamp. Co.'s list.....70&10%
Buffalo, S. S. & Co.....33⅓&2%

Silver Plated—
4 months or 5% cash 30 days:
Meriden Brit. Co., Rogers.....40&15%
C. Rogers & Bros.....40&15%
Rogers & Bros.....40&15%
Reed & Barton.....40@40&5%
Wm. Rogers Mfg. Co.....40, 15&5%
Simpson, Hall, Miller & Co.....40, 15&5%
Holmes & Edwards Silver Co.....40, 15&5%
L. Boardman & Son.....50&12½&5

Miscellaneous—
Holmes & Edwards Silver Co.:
No. 67 Mexican Silver.....50&10&5%
No. 30 Silver Metal.....50&10&5%
No. 24 German Silver.....50&10&5%
No. 50 Nickel Silver.....50&5%
No. 49 Nickel Silver.....50&10&5%
Wm. Rogers Mfg. Co.:
Rogers' Silver Metal.....50&10&6%
18% Rogers' German Silver.....60&6%
28% Rogers' Nickel Silver.....50&6%
German Silver.....60@50&5%
German Silver, Hall & Elton..50&5% cash
Nickel Silver.....50&5@50&10&5% cash
Brittannia.....60@60&5%
Boardman's Nickel Silver, list July 1, 1891.....60&7½&5%
Boardman's Brittannia Spoons, case lots.....60&5% cash

Springs—
Door—
Torrey's Rod, 39 in.....₩ doz $1.20@1.2
Warner's No. 1, ₩ doz $1.50; No. 2, $8.40.....55@55&10%
Gem (Coil), list April 19, 1886.....20%
Star (Coil), list April 19, 1886.....20&10%
Victor (Coil).....60&10@60&10&5%
Champion (Coil).....60&10@60&10&10%
Powell's, No. 1, ₩ doz $18.00; No. 2, $15.00.....50@50&10%
Rubber, complete, ₩ doz $4.50.....55&10%
Hercules.....50@50&10%
Phœnix.....33⅓&5

Carriage, Wagon, &c.—
Elliptic, Concord, Platform and Half Scroll.....60&10@60&10&10&10 or net prices
Cliff's Bolster Springs.....25%

Squares—
Steel and Iron.....
Nickel-Plated.....} .80&10&10@80&25%
Try Square and T Bevels.....60&10&10%
Disston's Try Square and T Bevels....50%
Winterbottom's Try and Miter....30&10%
Starrett's Micrometer Caliper Squares.....25%
Avery's Flush Bevel Squares.....40%
Avery's Bevel Protractor.....50%

Squeezers—
Fodder—
Blair's.....₩ doz $2.00
Blair's "Climax".....₩ doz $1.25

Lemon—
Porcelain Lined, No. 1....₩ doz $6.00 25&20%
Wood, No. 2.....₩ doz $3.00, 35%
Wood, Common.....₩ doz $1.70@1.75
Dunlap's Improved.....₩ doz $3.75, 20%
Samms.....No. 1, $5,00; No. 2, $9; 12, $18 ₩ doz.....25&10%
Jennings' Star.....₩ doz $2.50
The Boss.....₩ doz $2.50
Dean's..Nos. 1, ₩ doz $6.50; 2, $3.35; 3, $1.90; Queen, $2.50
Little Giant.....50@50&5%
King.....40&5%
Hotchkiss Straight Flash....₩ doz $12.00
Silver & Co., Glass.....₩ gro. $9.00

Standard Fiber Ware—
See *Ware, Standard Fiber.*

Staples—
Barbed Blind, ½ in. and larger.₩ ℔ 7@7½¢
Barbed Blind, ¾ in.....₩ ℔ 8@8½¢
Fence Staples, Galvanized.} Same price
Fence Staples Plain.....} as B'rb Wire
See Trd. Rep
Grand Crossing Tack Co.'s list....75&10%

Steelyards.....40&10@50%

Stocks and Dies—
Blacksmith's:
Waterford Goods.....35%
Butterfield's Goods.....35%
Lightning Screw Plate.....25@30%
Reece's New Screw Plates.....25@30%
Reversible Ratchet.....30%
Gardner.....25%
Green River.....25@30%

Stops, Bench—
Morrill's, ₩ doz., Nos. 1, $9.50; 2, $12.00 40&20%
Hotchkiss's.....₩ doz $5, 10@10&10%
Weston's, No. 1 to No. 2, $9, 25&10&5%
McGill's, ₩ doz $3.....10%
Cincinnati.....25&10%
Terrell's Nos. 1 and 2, ₩ doz., $3; No. 3, $3.60.....80%
Millers Falls.....25%
Stearns'.....20&10%

Stone
Stones, Grind—See *Grindstones.*
Scythe Stones—
Pike Mfg. Co., list April, 1892.....33⅓&5
Cleveland Stone Co., list Nov. 1892..33⅓&5

Oil Stones, &c.—
Pike Mfg. Co:
Hindostan No. 1, ₩ ℔....8¢
Sand Stone.....5¢
Turkey Oil Stone, 4 to 8 in.....80¢ } 40 @ 40& 10%
Turkey Slips.....$2.00
Lily White Washita.....60¢
Rosy Red Washita.....60¢
Washita Stone, Extra.....50¢
Washita Stone, No. 1.....40¢
Washita Stone, No. 2.....30¢
Lily White Slips.....90¢
Rosy Red Slips.....90¢
Washita Slips, Extra.....80¢
Washita Slips, No. 1.....70¢
Arkansas Stone, No. 1, 3 to 5½ in., $2.80
Arkansas Stone, No. 1 5½ to 8 in., $3.50
33⅓@33⅓&10%
Lake Superior.....₩ ℔ 13¢
Lake Superior Slips.....₩ ℔ 20¢

Stove Polish—
See *Polish, Stove.*

Stretchers Carpet—
Cast Steel, Polished.....₩ doz $2.2
Cast Iron, Steel Points.....₩ doz 75@80¢
Socket.....₩ doz $1.75
Bullard's.....25@25&10%

Strops, Razor—
Genuine Emerson.....60@60&5%
Imitation " ..₩ doz $2.00, 20&10&5%
Torrey's.....20%
Badger's Belt and Com.....₩ doz $2.00
Lamont Combination.....₩ doz $4.00
Jordan's Pat. Padded, list Nov. 1, '89, 50%
Electric Cutlery Co.....Net
Campbell Cutlery Co.....Net

Stuffer, Sausage—
Miles' Challenge, ₩ doz $20.....50@50&5%
Perry....₩ doz, No. 1, $15.00; No. 0, $21.00.....50&5@50&10%
Draw Cut No. 4, each $30.00.....20%
Enterprise Mfg. Co., list Jan 17, '93..25%
Silver's.....40&10%

Sweepers, Carpet and Lawn—
Carpet—
Bissell No. 5.....₩ doz $17.00
Bissell No. 8.....₩ doz $20.00
Bissell, Grand.....₩ doz $36.00
Standard.....₩ doz $24.00
Domestic.....₩ doz $21.00
Domestic, No. 2.....₩ doz $22.00
Grand Rapids.....₩ doz $24.00
Crown Jewel, No. 1, $18.00; No. 2, $19.00; No. 3, $20.00
Magic.....₩ doz $15.00
Improved Parlor Queen, Nickeled.....₩ doz $27.00
Japanned.....₩ doz $24.00
Excelsior.....₩ doz $22.00
Garland.....₩ doz $18.00
Parlor Queen.....₩ doz $24.00
Housewife's Delight.....₩ doz $15.00
Ladies' Friend.....₩ doz $15.00
Ladies' Friend No. 2.....₩ doz $16.00
Advance.....₩ doz $18.00
Our Leader.....₩ doz $19.00
Triumph.....₩ doz $20.00
Goshen.....₩ doz $21.00
Supreme.....₩ doz $22.00
Easy.....₩ doz $22.00
Gilt Edge.....₩ doz $24.00
Acme.....₩ doz $26.00
Imperial.....₩ doz $26.00
Grand Republic.....₩ doz $30.00
Banner.....₩ doz $22.00
The Star.....₩ doz $21.00
Reliable.....₩ doz $22.00
The Rapid.....₩ doz $22.00
Our Own.....₩ doz $27.00
Model.....₩ doz $27.00
Goshen Sweeper Company, Grand Rapids, Mich., make the following rebates:
5 dozen in 6 months.....₩ doz $1.00
10 dozen in 6 months.....₩ doz $2.00
25 dozen in 6 months.....₩ doz $3.00
Except on L. F., when 10 dozen price is $13.50, and 25 dozen $13.00.

Lawn—
Thompson Mfg. Co.....30%

Swings—
Davies Lawn.....25%

Tacks, Brads, &c.—
List October 19, 1889. Old established straight Weights. Short Weight goods are sold at lower prices.
Carpet Tacks—
American, Blued.....66⅔%
American, Tin'd and Cop'd.....70%
Steel, Bright and Blued.....66⅔%
Steel, Tinned and Coppered.....70%
Swedes Iron, Blued.....72½%
Swedes Iron, Tinned.....75%
American Iron Tacks, Domestic.66⅔%
Swedes Iron Tacks—
S. S., Blued.....66⅔%
S. S., Tinned.....70%
Lanc., Blued.....55%
Lanc., Tinned.....60%
Gimp and Lace Tacks—
S. S., Blued.....62½%
S. S., Tinned.....66⅔%
Lanc., Blued.....55%
Lanc., Tinned.....60%
Basket and Trimmers' Tacks—
Lanc.....52½%
S. S.....55%
Hungarian Nails.....60%
Common and Patent Brads.....55%
Leathered Tacks.....10%
Brush Tacks, S. S.....60%
Looking Glass Tacks, S. S.....35%
Picture-Frame Points, S. S.....35%
Finishing Nails.....60%
Trunk and Clout Nails—
Black.....65%
Tinned or Coppered.....67½%
Basket Nails.....60%
Chair Nails.....52½%
Cigar Box Nails.....45%
Tin Capped Nails.....50%
Extra discount 25&2½

Miscellaneous—
Double Point.....90@90&10%
Wire Carpet Nails.....50&10%
Claw Handle Carpet.....₩ gross $4.00
Bonnie Blue.....₩ box 1.50
Bill Nye Brad Box.....4 00
Parisian Gilt Nails, cartoon.....50
Home Tacks, No. 50 ₩ case (12 cartons), $36.00; No. 100, ₩ case (12 cartons), $72.00.
Home Nails, No. 200, ₩ case (12 cartons), $30.00; No. 400, ₩ case (12 cartons), $60 00.
} 60&2½
Upholsterers' Nails.....50&10%

Wire Brads and Nails
Steel-Wire Brads, R. & E. Mfg. Co.'s list 50&10%
See also *Nails, Wire.*

Tanks, Oil—
Emerald, S. S. & Co.: 30-gal. $8.75; 60-gal., $11 each.....50&10&5%

Tapes, Measuring—
American.....40@40&5%
Spring.....40%
Chesterman's, Regular list.....25@30%

Thermometers—
Tin Case.....80@80&10%

Thimble Skeins—See *Skeins.*

Ties, Bale—Steel.
Standard Wire, list.....50&10&5%

Tinners' Shears, &c —
See *Shears, Tinners' &c.*

Tinware—
Stamped, Japanned and Pieced, list Jan 20, 1887.....70&10@70&25%

Tire Benders, Upsetters, &c.—See *Benders and Upsetters, Tire.*

Tobacco Cutters—
See *Cutters, Tobacco.*

Tools—
Coopers'—
Bradley's.....20%
Barton's.....20@20&5%
L. & I. J. White.....20&5%
Albertson Mfg. Co.....25%
Beatty's.....30%
Sandusky Tool Co.....30@30&5%
Shaves Cincinnati Tool Co.....20%

Lumber—
Ring Peavies, "Blue Line"..₩ doz $20.00
Ring Peavies, Common.....₩ doz $18.00
Steel Socket Peavies.....₩ doz $21.00
Mall. Iron Socket Peavies...₩ doz $19.00
Cant Hooks, "blue Line"....₩ doz $16.00
Cant Hooks, Common Finish..₩ doz$14.00
Cant Hooks, Mall. Socket Clasp, "Blue Line" Finish.....$16.00
Cant Hooks, Mall. Socket Clasp, Common Finish.....₩ doz $14.50
Cant Hooks, Clip Clasp, "Blue Line" Finish.....₩ doz $14.00
Cant Hooks, Clip Clasp, Common Finish.....₩ doz $12.00
Hand Spikes....₩ doz 6 ft., $15.00; 8 ft., $20.00
Pike Poles, Pike & Hook, ₩ doz, 12 ft., $11.50; 14 ft., $12.50; 16 ft., $14.50; 18 ft., $17.50; 20 ft., $21.50.
Pike Poles, Pike only, ₩ doz, 12 ft., $10.00; 14 ft., $11.00; 16 ft., $13.00; 18 ft., $16.00; 20 ft., $20.00.
Pike Poles, not Ironed, ₩ doz, 12 ft., $8.00; 14 ft., $7.00; 16 ft., $9.00; 18 ft., $12.00; 20 ft., $16.00.
Setting Poles, ₩ doz, 12 ft., $14.00; 14 ft., $15.00; 16 ft., $17.00.
Swamp Hooks.....₩ doz $18.00

Saw—
Atkins', new list.....40%

Transom Lifters—
See *Lifters, Transom.*

Traps—
Game—
Newhouse.....40@40&5%
Oneida Pattern.....70&10%
Game, Blake's Patent.....40&10&5%

Mouse and Rat—
Mouse Wood, Choker, ₩ doz holes, 9@10¢
Mouse, Round Wire.....₩ doz $1.50 10%
Mouse, Cage, Wire.....₩ doz $2.50 10%
Mouse, Catch-'em-alive..₩ doz $2.50 15%
Mouse, Bonanza.....₩ doz 0.90@$1.00
Rat, Decoy.....₩ gr $10.00, 10%
Ideal.....₩ gr $10.00
Cyclone.....₩ gr $5.25
Hotchkiss Metallic Mouse, 5-hole traps, ₩ doz., 75¢; in full cases, ₩ doz.60@65¢
Hotchkiss Imp. Rat Killer...₩ gro $18.50
Hotchkiss New Rat Killer...₩ gro $16.50
Schuyler's Rat Killer.....₩ gro $15.00
Dandy.....₩ doz., $1.75
Waddel's Go Bang, ₩ gro.....$12.50

Fly—
Harper, Champion or Paragon.....₩ doz. $1.75, ₩ gro. $16.50
Balloon, Globe or Acme.....₩ doz. $1.50, ₩ gro. $13.50

Triers—
Butter and Cheese.....25%

Trimmers, Spoke—
Bonney's.....₩ doz $10.00, 50%
Stearns'.....20&10%
Ives', No. 1, $15.00; No. 2, $12.00 ₩ doz. 55&10%
Douglas'.....₩ doz $9.00, 20%
Cincinnati.....25%

Trowels—
Lothrop's Brick and Plastering, 20&10&5@35%
Reed's Brick and Plastering.....15%
Disston's Br'k and Plastering.25@25&10%
Peace's Plastering.....25@25&5%
Clement & Maynard's.....20@20&5%
Rose's Brick.....15@20%
Brade's Brick.....25%
Worrall's Brick and Plastering.....20%
Garden.....70%
Cleves' Angle Trowel, ₩ gro, No. 1, $36; No. 2, $30; No. 3, $15. net @ 10%

Trucks, Warehouse, &c.—
B. & L. Block Co.'s list.....40%
Thompson Mfg. Co.....40%
Barnes' Barrel Trucks.....40%

Tubes. Boiler—
See Pipe

Twine—
Flax Twine—

	Dec.	Ex.
No. 9, ¼ and ⅛ ℔ Balls	26¢	31¢
No. 12, ¼ and ⅛ ℔ Balls	22¢	30¢
No. 18, ¼ and ⅛ ℔ Balls	20¢	29¢
No. 24, ¼ and ⅛ ℔ Balls	20¢	29¢
No. 36, ¼ and ⅛ ℔ Balls	18¢	28¢

No. 264 Mattrass, ¼ and ⅛ ℔ Balls, 52@54¢
Chalk Line, Cotton, ⅛ ℔ Balls.....25¢
Mason Line, Linen, ⅛ ℔ Balls.....55¢
2-Ply Hemp, ¼ and ⅛ ℔ Balls (Spring Twine).....15⅓¢
3-Ply Hemp, 1 ℔ Balls.....16@16⅔¢
3 Ply Hemp, 1½ ℔ Balls.....15@15⅓¢
Cotton Wrapping, 5 balls to ℔..15@16¢
2, 3, 4 and 5 Ply Jute, ⅛ ℔ Balls.....10¢
Wool.....6½@6⅔¢
Paper.....13@14¢
Cotton Mops, 6, 9, 12 and 15 ₩ to dos..18¢

Vises—
Solid Box.....50&10@60%

Parallel—
Fisher & Norris Double Screw.....15&10%
Stephens'.....25@30%
Parker's.....20@25%
Wilson's.....55%
Howard's.....40%
Bonney's.....50%
Millers' Falls.....40@40&10%
Trenton.....40&5@40&10%
Merrill's.....15@20%
Hollands'.....35@40%
Sargent's.....70&10%
Backus and Union.....40%
Double Screw Leg.....15&10%
Prentiss.....20@25%
Simpson's Adjustable.....40%
Moore's.....20%
Massey Quick Action.....20@25%

Saw Filers—
Bonney's, Nos. 2 & 3, $15.00.....40&10@50
Stearn's.....33⅓&10@33⅓&10&10%
Stearn's Silent Saw Vises.....33⅓@35%
Hopkins'.....₩ doz $17.50, 10%
Reading.....40&10%
Wentworth.....20&10%
Economy, ₩ doz., Nos. 110, $10.00; 120, $15.00.....50&10&10&5%

Miscellaneous—
Phœnix Vises.....33⅓%
Phœnix Hand Vises....₩ doz $3.60, 33⅓%
Cowell Hand Vises.....20%
Bauer's Pipe Vises.....10%
Cincinnati.....25&10%
Enterprise Pipe Vises.....each $3.00, 40%
Massey Combination Pipe Vise.....40%

Wads—Price Per M.

U.M.C.&W.R.A.—B. E., 11 up..	68¢
U.M.C.&W.R.A.—B. E., 9&10..	82¢
U.M.C.&W.R.A.—B. E., 8.....	96¢
U.M.C.&W.R.A.—B. E., 7.....	$1.10
U.M.C.&W.R.A.—P. E., 11 up.	1.15
U.M.C.&W.R.A.—P. E., 9&10..	1.50
U.M.C.&W.R.A.—P. E., 8.....	1.70
U.M.C.&W.R.A—P. E., 7.....	1.80
Eley's B. E., 11 and larger.....	$1.70@$1.75
Eley's P. E., 12 to 20.....	3.00@ 3.25

Dis. 30&2½%

Wagon Boxes—
See *Boxes, Wagon.*

Wagon Jacks—
See *Jacks, Wagon.*

Ware, Hollow—
Cast Iron, Hollow—
Stove Hollow-Ware—
Ground.....60&10@60&10&10%
Unground.....65&10@70&5%
White Enameled Ware—
Maslin Kettles.....70&10@75%
Boilers and Saucepans.....60@60&5%
Tinned Boilers and S'pans.....60@60&5%
Rustless Hollow Ware.....50@50&5%
Gray Enameled Ware—
Stove.....50%
Maslin Kettles.....60&60&10%
Boilers and Saucepans.....40&5%

Enameled—
Agate and Granite Ware, list Jan. 1, 1889.....33⅓&10%
Ironclad Enameled Ware....dis 33⅓&10%

Kettles—
Galvanized Tea-Kettles—

Inch.....	6	7	8	9
Each....	55¢	60¢	65¢	75¢

Standard Fiber—

	Per Doz. Plain.	Decorated.
Wash-Basins, 10½ in.....	$1.80	2 00
Wash-Basins, 12 in.....	2.00	2.50
Keelers, 11¼ in.....		1.50
Cuspidors.....		7.50
Spittoons, "Daisy," 8 in.	3.50	4.00
Peck Measure.....	3.50	
Half-peck Measure.....	3.00	

See also Pails.

Indurated Fiber.—
Spittoons No. 2, ₩ doz.....$6.00
Basins, Ringed, ₩ doz., No. 2.....2.80
Washtubs, Nested, Nos. 0, 1, 2 and 3 (4 pieces), ₩ nest.....$5.75
Keelers Nested, Nos. 1, 2, 3 and 4 (4 pieces), ₩ nest.....$2.55
Butter Bowls 15, 17 and 19-inch (3 pieces), ₩ nest.....$1.50
Liquid Measures, pt., qt., 2 qt. and funnel (4 pieces), ₩ set.....$1.20
} 50%
See also Pails.

Silver Plated, Hollow—
4 mo. or 5 % cash in 30 days.
Reed & Barton.....
Meriden Britannia Co.....
Simpson, Hall, Miller & Co.....
Rogers & Brother.....
} 40&5%
Hartford Silver Plate Co.....
William Rogers Mfg. Co.....
} 40&5&5%

Washers—

Size hole.....	5-16	⅜	½	⅝ to 1⅛
Washers.....	5½	4½	3½	2½

In lots less than 200 ℔, ₩ ℔, add ½¢, 5-lb boxes 1¢ to list.

Washer Cutters—
See *Cutters, Washers.*

Water Coolers—
See *Coolers, Water.*

Wedges—
Iron.....₩ ℔ 3½¢
Steel.....₩ ℔ 8½¢

Weights, Sash—
Solid Eyes.....₩ ton $18.00@$19.00

Well Buckets Galvanized—See *Buckets, Well, Galvanized.*

Wheels Well—
8 in., $2.00 10 in. $2.50 12 in $2.75

Whips

American Whip Co.: Length.	4½	5	5½	6	6½	7	7½	8 ft.
X. L. Whalebone Driving...	$18.00	20.00	22.00	24.00	27.00	30.00	33.00	36.00
Eureka, Two thirds Whalebone.	....	....	15.00	16.50	18.00	20.00	....	....
Bull Bone, Half-length Whalebone.	....	....	11.00	12.00	13.00	15.00	....	....
American Standard	8.00	8.50	9.50	10.50	12.00	13.50	15.00	16.50
True Grip, Raw Hide Center....	6.00	6.00	6.50	7.00	7.50	9.00	....	....
New Name, Stocked Java, Black and Wine Colors	....	....	....	6.00	....	....	....	....
Americus, 93 Pen Whip	....	....	....	6.00	....	....	....	....
Gents' Light Driving No. 111...	...	....	....	6.00	....	....	....	....
Gents' Light Driving No. 106...	....	....	....	5.00	....	....	....	....
Hand-made Stocked Java No. 103	....	....	3.75	4.00	....	....	....	....

Per dozen.

A large variety of cheaper grades.....50@$3.00
Team Whips.....$2.00@$7.50
Toy Whips.....₩ gro. $2.50@$12.00
Hardware Assortment, 10/American, 75 Whips for $50.00.

Wire and Wire Goods—

Iron—

Market,

Br. & Ann., Nos. 0 to 18, 75&10@75&10&5%
Cop'd, Nos. 0 to 18.75&5%
Galv., Nos. 0 to 18 70&5@70&10%
Tin'd, Tin'd list, Nos. 0 to 18.....70@70&10%

Extra 5@10% often given and net prices often made on large lots.

Stone,
Br. and Ann'd, Nos. 16 to 18.....80%
Bright and Ann'd, Nos. 19 to 26.....80&5%
Br. and Ann'd, Nos. 27 to 36 .....82½&5%
Tinned .....65&10%

Extra 10% often given.

Tinned Broom Wire, 18 to 21, ₩ ℔....4½¢
Galvanized Fence .....75&10%
Brass, list Jan. 18, 1884..... .....40&5%
Copper, list Jan. 18, 1884 .....40@5%
Annealed Wire on Spools 60%
Malin's An'aled & Tin'd on Spools..60&5%
Malin's Brass and Cop. on Spools...50&5%
Ossawan Mills, An'ld and Tinned on Spools.....60&10%
Ossawan Mills, Brass and Copper on Spools.....50&10%
Tate's Spooled, Tin'd & Annealed..60&5%
Tate's Spooled Cop. and Brass 50%
Cast Steel Wire 50%
Stubs' Steel Wire.....$6.00 to £, 30%
Steel Music Wire, 12 to 30, imported.... 60@70¢ ₩ ℔
Wire Clothes Line, see Lines.
Wire Picture Cord, see Cord.

Bright Wire Goods—

Standard list.....85@85&10%

Wire Cloth and Netting—

Painted Screen Cloth ₩ 100 ft. $1.75@$2.00
Galvanized Wire Netting.....75@75&10%

Wire Barb—

See Trade Report.

Wire Rope—See *Rope, Wire.*

Wrenches—

American Adjustable 40%
Baxter's Adjustable "S".....40&10@50%
Baxter's Diagonal.....60%
Coes' Genuine .....50@50&10%
Coes' "Mechanics'".....50&10&3%
Girard Standard.....65&10@70%
Lamson & Sessions' Engineers'....60&10%
Lamson & Sessions' Standard.....70&10%
P. S. & W. Agricultural.....
Girard Agricultural.....
Lamson & Sessions' Agric'l..
W. & B. Diamond.....

75&10@80%

Bemis & Call's:
Pat. Combination Bright .. ..40&5%
Pat. Combination Black .....40 & 10%
Merrick's Pattern.....45%
Brigg's Pattern.....30&10%
Cylinder or Gas Pipe.....45&5%
No. 3 Pipe 55%
Aiken's Pocket (Bright).....$6.00, 60&10%
The Favorite Pocket.....₩ doz., $4.00, 40%
Webster's Pat. Combination.....25%
Boardman's..... 35%
Always Ready.....25&5%
Alligator.....50%
Donohue's Engineer.....20&10%
Eagle.....60&10%
Acme, Bright .....50&5%
Acme, Nickeled.....40&5%
Hercules.....70@70&5%
Walker's.....55&5%
Diamond Steel.....55&5%
Cincinnati Brace Wrenches.....25&10%
Tafts Vise Wrench.....55&10&5%

Wringers, Clothes—

Am. Wringer Co.'s list, Jan. 2, '93..2% cash
Colby Wringer Co., list Sept. 1, '91..2% cash
Lovell Mfg. Co., list Jan. 1, 1892..2% cash
Peerless Mfg. Co., list Feb., 1892..2% cash
National Wringer & Mfg. Co., list June 1, 1892.....2% Cash

Wrought Goods—

Staples, Hooks, &c., list March 17, 1893 85&10@85&10%

News and Notes.

The British Isles are suffering from a fodder famine, caused by the long drought. Hay is cabled from London as scarce at $40 a ton. The agricultural distress caused by lack of rain is widespread throughout Europe.

A military road, connecting the cities of Baltimore and Washington, is projected, to be used for the movements of troops in case of interruption to railway travel by riots, &c. The expense will be borne by the Government and the State of Maryland.

Forest fires in the Mesaba range have caused serious destruction of property in the mining towns and camps. Loss to the extent of $1,500,000 is spoken of.

The aspect of affairs in Australia appears, by last advices, to be brightening. It is thought the crisis has been reached and passed, and that any changes will now be for the better. The announcement that the Bank of England had decided to discount bills of Australian banks which have been strong enough to hold their own has caused a returning feeling of confidence. The London *Financial News* says, in regard to the situation: "Notwithstanding all that has happened in Australia—overspeculation, bad legislation, government extravagance and corruption, and everything else—the Australian colonies contain vast resources and are fully able to pay their way."

A recent statement issued by the Japanese Customs Bureau shows that the foreign trade of Japan is increasing more rapidly with the United States than it is with England, France or Germany. The increased exports to this country are mainly under the head of Japanese teas and silks. Direct imports from the United States in 1892 amounted to only $6,000,000, but this is a new and growing trade.

Official statistics show the export trade of New Zealand to be increasing at a very satisfactory rate. The principal product of the colony—wool—was exported to the value of $20,703,874 last year; frozen meat, a new and growing industry, shows $4,960,170 worth sent out of the islands in 1892. Gold exports reached nearly $5,000,000 in the same period. The other staple products, namely, butter, tallow, Kauri gum, wheat and oats, all show an increase; while flax exports fell off $335,000, as compared with 1891.

The Westinghouse Electric Company's charges against certain officials of the General Electric Company, and others, have been sustained by the Grand Jury at Pittsburgh, who, it is announced, found a true bill against the defendants. It is alleged that the persons accused conspired to secure blue prints and tracings, showing the design and construction of certain machinery owned by the Westinghouse Electric Company.

San Francisco papers say that the final trial trip of the United States coast-defense ship "Monterey" has developed the fact that she is a good seaboat, but a failure as a fighter. Her big guns wrecked their hydraulic machinery when fired but once, and if they were loosed for action in a sea they would tear the vessel to pieces. The fault is said to lie in the designs, and not with the builders, who carried out their contract faithfully.

The ship channel at Mobile, Ala., from the city wharves to the lower bay is to be deepened to 23 feet to allow vessels of 20-feet draft to load at the wharves. A project is also on foot for the construction of the Mobile, Jackson & Kansas City Railroad, which would be a valuable feeder to the port.

Southern farmers to-day are not depending solely on their cotton crops for a living. In the majority of States most agriculturists are raising diversified crops, and this practice is becoming more general every year. Cotton raising in Georgia and the Carolinas will, it is said, soon hold second place, as to value, among the agricultural products of those States, because of the increase in production of cereals, fruit and vegetables.

The beet sugar industry of this country is growing to be an important one. Last year's production furnished sufficient sugar for the average supply of half a million of the population. Great endeavors are to be made to extend and consolidate the enterprise.

The rumor to the effect that Secretary Carlisle purposed removing the United States mint from Philadelphia has been emphatically denied. The Quakers are at present agitated over the choice of a site for the new building in their city.

Advices from the West report the likelihood of short supplies of cattle and hogs for some time to come. The long and cold spring experienced in that section has reduced the number of young rising pigs, and litters are said to have been unusually small. Stocks of provisions on hand are, however, large; and as the generally depressed state of trade in Europe will tend to check exportation, there is no expectation of any present rise in prices.

The yield of the sugar orchards of Maine, New Hampshire and Vermont is about 70 per cent. greater than that of last year.

The aggregate value of the iron, steel, foundry and machine shop products of Paterson, N. J., last year was a little over $3,000,000, or nearly three times as great as that of the silk and textile industries for which the city is principally famous in popular estimation.

Two large screw passenger steamers for the Old Dominion Line are to be laid down at once at Roach's shipyard, Chester, Pa. They will be similar in construction to those previously built; the dimensions being 322 feet length over all; 40 feet beam, and 34½ feet depth; and the cost about $350,000 each.

The *Nautical Magazine* says that owners of steamers built of mild steel are beginning to find out that when subjected to heat and the action of acid it deteriorates much more rapidly than iron. In some cases, it is reported, the inner plating of the double bottom in the range of the engine room has corroded through in a very short time.

An exact measurement has been taken of the big gas well at Findlay, Ohio. The gauges showed that the well was producing 18,380,000 cubic feet of gas per day.

At a meeting of the United States Wheat Millers' League recently held at Toledo, Ohio, letters were read from American consuls in Europe and the West Indies offering their services in aiding the extension of foreign markets for American flour.

The probability is mentioned that some of the hop growers of New York State may introduce the cultivation of hops into North Carolina, portions of which State are said to be peculiarly favorable to the cultivation of the plant.

Over 1,000,000 acres of land for coffee cultivation have been sold in Mexico during the past six months, many Americans being among the purchasers. European syndicates are reported to have acquired extensive coffee lands in the States of Vera Cruz and Oxaca.

Sailors and others interested in shipping are to meet in London at an International Maritime Congress next month. Thirteen nations will, it is said, be represented.

LABOR EXCHANGE.

Notices under this heading of reasonable length are inserted free of charge. Only those relating to employment are admitted. Write distinctly on one side of paper only, and do not use postal cards.

HELP WANTED.

A large tinware manufacturing house wants a man thoroughly posted in that line to take charge of their shipping department, which includes the getting out and packing of orders; one who has held a similar position preferred; to the right party this is an excellent opening. Address, with references, "Tinware," office of *The Metal Worker*, 96-102 Reade street, New York City. July 1

A first-class COPPERSMITH who thoroughly understands making hotel kitchen utensils. "W. L. C.," office of *The Metal Worker*, Bank of Commerce Building, St. Louis, Mo. July 1

A first-class HOT-WATER FITTER; one who can do general jobbing on tin and sheet-iron work; good pay; steady work. C. K. & C. W. Labaree, Bellows Falls, Vt. July 1

Experienced man to take charge of steam heating and plumbing department. Canfield Stove Company, Rondout, N. Y. July 1

A man thoroughly acquainted with the trade to travel, handling our self-pouring oil can. Paine, Diehl & Co., Philadelphia, Pa. July 1

PLUMBER and TINSMITH; one that is willing to take hold of any kind of a job; must be single and strictly temperate; steady work; $2.25 per day. Wm. M. Murphy, master plumber, N. Y. & N. E. R. R., Putnam, Conn. June 24

A first-class TINSMITH, ROOFER; one who can do furnace work; state wages and give references. Lock Box 171, Lakewood, Ocean County, N. J. June 24

At once, by a Chicago wholesale stove house, two live SALESMEN for country that can sell stoves. "Wholesale," office of *The Metal Worker*, 59 Dearborn street, Chicago, Ill. June 24

TINSMITH for in and outside work; only good men need to apply. West Hoboken Galvanized Iron Cornice & Skylight Works, 612 Spring street, West Hoboken, N. J. June 24

A good SHEET-IRON WORKER and TINNER; must be strictly sober. James Enright, Bordentown, N. J. June 24

A first-class CORNICE MAKER who understands drafting, cutting, making and putting up, to take charge of small shop; steady employment to good man. Address, "D. W.," office of *The Metal Worker*, 96-102 Reade street, New York City. June 17

TINNERS and GALVANIZED IRON CORNICE WORKERS, also a CUTTER, by the A. K. Sweet Mfg. Company, 915 Baltimore avenue, Kansas City, Mo. June 17

At once two first-class TINNERS to do all kinds of job work—men who understand plumbing preferred; steady work the year round. M. E. Loveland, Gouverneur, N. Y. June 17

At once, a first-class TINSMITH; one that can do roofing gutter work, also pump and furnace work; must be temperate and steady; steady work to the right man; state wages. P. E. Fraleigh, Red Hook, N. Y. June 17

SITUATIONS WANTED.

SALESMAN would like to engage with house carrying a full line of tinners' supplies to cover New England States; can dispose of large amount of goods, as previous records will show. "D.," 575 Hudson street, New York. July 1

A first-class TIN and SHEET IRON WORKER, has been at the trade for 20 years doing furnace, stove, roofing, pumps, iron pipe and general jobbing, wants a steady situation; temperate and reliable. F. Mead, Long Island City, N. Y. July 1

STOVE SALESMAN that is acquainted with the trade in Missouri to represent a good line of goods that is made near that territory and known in that State; give reference and state salary wanted "R.," office of *The Metal Worker*, 22-24 Pickering Building, Cincinnati, Ohio. July 1

By a young man of 31, married, in retail stove and tinware store; five years' experience as salesman and buyer; A1 reference. "Stoves," office of *The Metal Worker*, 96-102 Reade street, New York City. July 1

By a sober and industrious TINNER and CORNICE MAKER, who also understands plumbing; can go to work in 30 days after notified; $2.50 a day desired, with steady work for a year. Chapman & Chapman, Hutchinson, Kan. July 1

PLUMBER, practical, and first-class mechanic, desires a position as FOREMAN, or would work journey work; 18 years' experience at trade; wages must be first class; please state wages. James Emmett, care of Usher, 427 E. 114th street, New York City. July 1

By a practical TINSMITH with 16 years' experience in all branches of the trade; can do furnace, heater, range, roofing and pump work and general jobbing; fair knowledge of plumbing; capable of taking charge of shop; steady position year round; state terms; German; married. "William," care H. Rathjen, 13 Columbia Heights, Brooklyn, N. Y July 1

A young man (28), thoroughly conversant with steam and hot-water heating, capable of estimating, drawing plans, erecting or superintending same, is desirous of a position with an establishment where industry will be appreciated. "Hot-Water Engineer," office of *The Metal Worker*, 96-102 Reade street, New York City. July 1

An ARTIST wishes work painting machinery or anything; wages very low; understands oil, water colors and varnish. "J. P.," Box 87, Medina, Ohio. July 1

By a first-class TIN and SHEET-IRON WORKER of 15 years' experience and a hustler; strictly sober and reliable; understands all kinds of work; city or country; has had charge of men. "Tinsmith," P. O. Box 37, Taunton, Mass. July 1

A young man with 12 years' experience desires a position as STOVE MOUNTER. William Rothfuss, Doylestown, Pa. July 1

Situation as FOREMAN or JOURNEYMAN BRASS MOLDER; first class on engineers' electric, hydraulic and general brass work, heavy or light; also on church, plantation and other bells; well up in the mixing and melting of any kind of metals and general details of a brass foundry; location no object. H. W. West, 231 Brush street, Detroit, Mich. July 1

TINSMITH, single man, 23 years of age, wants a steady job; city or country; has some experience at plumbing. "Tinsmith," care of Mr. Littmann, 1575 Avenue A, New York July 1

By a strictly temperate and steady man as STEAM, GAS and WATER FITTER; eight years' experience at house heating. F. Pierce, 10 Wellington street, Worcester, Mass. July 1

PLUMBER, who can do gas fitting, sober and reliable, wants steady work in or near the city. B. J. Correy, 362 West Forty-third street, New York City. July 1

A young man of good character and moral habits desires to represent on the road some reliable and well-established furnace house; has had experience; can furnish A1 testimonials as to integrity and efficiency "M. L.," care of Henry Smith, office of *The Metal Worker*, corner Fifth and Main streets, Cincinnati, Ohio. July 1

As ENAMEL MAKER, for all kinds of cast iron; 14 years' experience; thoroughly understands the business. Joseph Dickinson, 913 Maine street, Bridgeport, Conn. July 1

By an experienced GALVANIZER; 15 years, experience in all grades of the work; for last five years managing a large sheet plant. "Sheet Plant," office of *The Metal Worker*, 96-102 Reade street, New York City. July 1

By a young man, 19 years of age, as a helper in a first-class plumbing shop; city or country; has worked two years at the business; wants steady position to finish trade; state wages; lead work preferred. Harry Jones, care of A. C. Henry, Court Square Hotel, Long Island City. July 1

A first-class SLATER would like steady position with some good firm; East preferred; steady and sober; can give best of references. "Slate Roofer," office of *The Metal Worker*, 96-102 Reade street, New York City. July 1

By a thoroughly competent hardwareman, a position as SALESMAN in a hardware store, or as TRAVELING SALESMAN for a hardware, stove or paint house; best of references given. "Reliable," Box 71, office of *The Metal Worker*, 96-102 Reade street, New York City. July 1

By a first-class PLUMBER; in city or country; single; state wages. James J. McCabe, 20 Lexington avenue, Bridgeport, Conn. July 1

By a TRAVELING SALESMAN, well acquainted with the stove, hardware and tinware merchants on the Pacific Coast, a position to travel in that territory. "Pacific," office of *The Metal Worker*, 96-102 Reade street, New York City. July 1

By an energetic business man, with eight years' experience in the stove, hardware and tinware business, a position on the road or in the house; competent to fill any position and not afraid of work. "Energetic," office of *The Metal Worker*, 96-102 Reade street, New York City. July 1

Young man 22, with five years' experience in planning and estimating hot-water and steam-heating apparatus, desires situation where he can advance himself, good draftsman, can furnish best of reference. H. L. Anness, 130 Vroom street, Jersey City, N. J. July 1

TINSMITH, single, 24 years old, general jobber, who has some knowledge of plumbing, wants a steady job, city or country. J. Loewe, 234 Washington street, Hoboken, N. J. June 24

A position as TINSMITH or HARDWARE clerk; five years' experience; A1 references; state wages, &c. "E. W. M.," 824 Clinton street, Defiance, Ohio. June 24

A PLUMBER of 3½ years' experience in a large city wants a situation under instructions for one year; in a shop that works all lead preferred. "J. F.," Box 24, office of *The Metal Worker*, 96-102 Reade street, New York City. June 24

A METAL PATTERN MAKER, FILER or FITTER wants a job; is sober, steady and reliable; has done some tin work, and is a handy all around man. "J. D., 11 Delevan street, Auburn, N. Y. June 24

TINNER; a thorough mechanic in all branches; capable of taking charge of a shop; thoroughly acquainted with retail hardware trade; very best of references given. Lock Box 27, Lawrenceburg, Ky. June 24

By a sober and industrious man desiring a change; capable of designing and making drawing, stamping and combination dies for soft-metal goods; can give references. "Capable," office of *The Metal Worker*, 96-102 Reade street, New York City. June 24

By an IRON and BRASS MOLDER to act in the capacity of foreman; well experienced in the melting and mixing of all kinds of metals; 20 years' experience; the best of references furnished. Box 80, Greenwich, N. Y. June 24

At once, by experienced TINNER and CORNICE WORKER; mountain town or city preferred, owing to ill health in family; can furnish references. "Mountain Town," office of *The Metal Worker*, 59 Dearborn street, Chicago. June 24

As FOREMAN or INSPECTOR in mounting department; has had 20 years' experience in a large stove works. Geo. Wittle, Buffalo, N. Y. June 24

FOUNDRY FOREMAN, by a molder of 24 years' experience on stove and furnace work; was foreman for seven years; can handle men to advantage; can melt and take entire charge of foundry; can give good references if required. "J. O. G.," 18 Bristol place, Detroit, Mich. June 24

By a first-class TIN and SHEET-IRON WORKER; thoroughly understands all kinds of job work, furnace work, steam heating and sanitary plumbing; can draft plans and estimate work; also handle men to the best advantage; strictly temperate and reliable; will call on parties who wish to employ. "P. L.," P. O. Box 391, Bridgeport, Conn. June 17

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Within 25 miles of Boston, Mass.; in a growing town of 3700 inhabitants; no opposition. Water mains and services are laid by this house. Stock at inventory January 1st, $3500. An exceptional opportunity for a young man of enterprise; easy terms. For further particulars apply to

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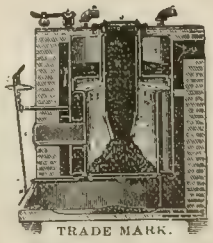
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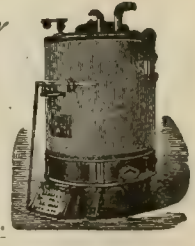

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THE METAL WORKER.

NEW YORK AND CHICAGO.

Saturday, July 8, 1893.

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Popular Disinclination for Manual Training.

In a recent conversation on manual training for boys, one who is interested in the management of a small trade school, lately established in connection with a New York church, complained bitterly of the unexpected difficulties he met with in obtaining the consent of parents for their boys to attend the manual training classes provided for them. The school in question is designed to cultivate a taste for handicrafts in the younger lads of the eastern district, in which the church to which it belongs is working. The idea is to prepare the boys for eventually joining one of the more advanced trade schools with a view to entering some useful and remunerative mechanical trade, such as carpentry, painting, plumbing, sheet metal working, &c. Instruction is gratuitous, and the hours are so arranged as not to interfere with the daily work of boys who may be in other employments. Everything is done to interest them by providing lectures and entertainments, in addition to the practical instruction. But notwithstanding these inducements the parents, although mostly in the poorest circumstances, do not care to have their children trained for manual labor. Their preference is that they should learn bookkeeping, or in some other way be fitted for clerkships or kindred occupations. There is a foolish and mistaken notion abroad, particularly among the poorer portion of the community, that there is a sort of "gentility" surrounding work in an office or a store which is not to be found in manual labor at the bench or the lathe. These silly people's ambition is to see their boys dressed in black coats, with nice white hands and linen instead of bearing the marks of honest and ennobling labor in a manual calling. They are not far-sighted enough to look ahead into the future prospects of either kind of work, and it is a difficult matter to persuade them that the best interests of their children mostly lie in the opposite direction to that toward which they incline.

Advantage and Dignity of Manual Labor.

Parents cannot understand that in training boys as mere writing machines or counter servers they are launching them on a market which is and always will be overstocked, while in fitting them for skilled labor they give them an education which, provided their moral and mental qualities are reliable, will insure for them steady and well-paying employment in the present, with the prospect of early independence and a position, when they have reached the upper rungs of their trade ladder, which not one in ten among the more stylishly appareled crowd of clerks can ever aspire to. The pecuniary advantages, present and future, of the skilled workman in such trades as are taught in manual training schools are in this way infinitely superior to those attaching to the average run of clerkships. But beyond and above this consideration there is, when rightly understood, a dignity and an ennobling character about the labor of the hands which recommends it to all honest and right-thinking minds as a thing to be admired, and which does not exist to the same degree in the so-called genteel occupations to which so many misguided youths of the poorer classes are devoted. "The dignity of labor," although a term too often prostituted to unworthy purposes by demagogues and agitators, so that to some noses it has acquired a stale and canting odor, is yet as true a phrase as ever gained currency. Like a golden coin it loses not one whit of its intrinsic value because it has been touched and used by unwashed or unworthy hands. This grand expression needs to be put up in its rightful position in the sight of all the rising generation who may be inclining to bow at the shrine of kid-gloved and stiff-collared gentility to the disparagement of the claims of honest and heaven-blessed manual labor.

Value of Sanitary Precautions.

The active precautionary measures adopted last year to prevent the introduction of cholera into the United States not only happily accomplished their object, but also appear to have had a wider effect for good than was calculated, in the prevention of general sickness in certain parts of the country where special sanitary work was done at that time. This fact is strikingly brought out in the report of the Michigan State Board of Health for the last quarter of 1892. This document records the fact of a remarkable decrease in the usual autumnal fevers, and generally through the entire list of diseases in that State, as compared with previous sickness statistics. This is attributed to the anti-cholera measures taken, and appears to signally verify the prediction of sanitarians that work to prevent the introduction and spread of cholera would be recompensed through the lessening of other complaints. In Michigan the precautions taken were of a particularly complete nature. All immigrants were medically examined and their baggage was disinfected at the border, thus lessening the chances of introduction of any communicable disease. The water supply, too, received special attention, and a house-to-house sanitary inspection was instituted and strictly carried out. To this preventive work the satisfactory result of lessened sickness and improved general health in the community are probably directly due, and it supplies evidence of the value and importance of those sanitary precautions which, when there is no imminent danger of cholera, are too often neglected. Whether the scourge is likely to cross the Atlantic this summer or not, it is too early to predict. Surgeon-General Wyman says, re-assuringly, that we have an even chance of escaping it, and that, even if it does come, our quarantine arrangements are so efficient that it is unlikely to become epidemic. It is sincerely to be hoped that these predictions will not lull the minds of State and municipal authorities into any such condition of supineness as would cause them to neglect any measures tending to secure immunity from cholera. As has been instanced in Michigan, sanitary precautions with this object will be well repaid by the beneficial effect they will certainly have on the public health. But they must not be undertaken in any perfunctory manner.

Value of Convention Papers.

A noticeable feature of the recent conventions of the master plumbers and fitters, held in Milwaukee and Chicago, was the number of interesting and instructive papers presented by the members, and which is a most encouraging sign, as it shows the sincerity with which the trade are supporting these associations. The primary objects of the organizations are of a commercial and business character, but now that they are getting well established and are carrying out the reforms and making the improvements in their trades that they have been working for, the members have more time and inclination to give to the educational features of the conventions, and are showing

a praiseworthy interest in the preparation of papers pertaining to their crafts. Each year we may expect to see a higher and higher level reached in these addresses, and the publication of papers of this sort by practical men will have a very wide reaching influence upon the trades and upon the regard in which they are held by the public.

New Enterprises.

The hard times are having an effect on the formation of new industrial corporations. The laws of some of the States, notably of Illinois, are very favorable for enterprises of a corporate character, and for some years past they have been launched at a rapid rate. The percentage of these resulting in genuine business undertakings and the actual investment of capital has been larger than would ordinarily be supposed. It was a comparatively easy matter to take a patented article, interest a few persons in its manufacture and start a company. Now, however, speculation in this direction has been checked by the scarcity of money, and the promoters of the few corporations being formed are having a serious time in securing financial backing. Meritorious schemes, as well as those wholly speculative, suffer alike under the grievous pressure now resting on business all over the country.

Education of the Body.

One of the greatest writers upon education, Professor Huxley, has put first, in his description of what constitutes a liberally educated man, a body that is "the ready servant of the will, and does with ease and pleasure all the work that, as a mechanism, it is capable of." The capacity of the human body, considered as a mechanism, has been very forcibly exemplified by the feats of the strong man, Sandow, who has been astonishing audiences in Europe and America by his remarkable strength. Being only 5 feet 8 inches in hight, and weighing only a little over 180 pounds, this wonderful athlete is by no means what one would call a large man; yet he has strength so much beyond what is usually met with in men of much larger frame and greater weight that, as regards muscular power, ordinary men are mere children in comparison. It is to be doubted, however, that the training of the body to its maximum of muscular power is the highest kind of physical training. This kind of education does not reach the point defined by Professor Huxley. It does qualify the human organism, considered as a mechanism, to do with ease and pleasure all of which that organism is capable. There are many things to be done in the work of the world that require delicacy and refinement of movement and touch, rather than massive strength, and this is especially the case in some kinds of mechanical construction. Here accuracy of movement, sensitiveness and precision are worth more than physical force. It is very questionable whether a man like Sandow, who can lift a heavy man from the floor on the palm of one hand, could ever regain that sensitiveness of touch necessary to the machinist in the operation of caliper-ing, or the precision of movement needed by a plumber in wiping a joint or in lead burning. The day is past when the mere brute force of a man has a high market value, except for exhibition purposes in roof gardens, dime museums and the like.

Chicago's Two Millions.

The claim is made by the Chicago newspapers that their new city directory, just completed, indicates a population of 2,000,000, if not more, within the city limits. The directory contains over 500,000 names, and the usual proportion in cities of such names to population is 1 to 4. This seems incredible, because it almost doubles the population within three years, or from the taking of the last United States census. Yet it is possible. All things are possible with Chicago. It is the phenomenal city of the world. Its officially recorded growth surpasses anything before known. This estimate may be reasonably correct. During the past year or two there has been tremendous growth in the manufacturing interests of Chicago. New manufacturing suburbs, within the city limits, have sprung up and grown at a very rapid rate, while the population of the built-up portion of the city has also increased visibly. It has been the subject of unceasing remark that the expansion of large office buildings barely kept pace with the demand for office accommodations, and an idle or tenantless store on any business thoroughfare was unknown. Advances in rents found somebody always willing to pay them. The World's Fair was responsible for some of this, of course, but not for all of it. Growth of population evidently was the great sustaining force. A city of two millions is a city to be proud of. We hope that the figures are correct when put to a stronger test than the estimate based on the directory.

Solvent Bankrupts.

The revolution of the wheel of time has again brought into distressful operation the law of the "survival of the fittest." There are variations, however, in the present application of this law which were not manifest to any considerable extent in previous periods of financial disturbance, and the term "solvency" has taken a new meaning. Heretofore an establishment has been considered solvent when its assets have exceeded its liabilities without regard to the immediate availability of the assets. Now, however, the lack of ready money, or the closing of an accustomed channel through which assets have been converted into cash, may force to the wall a great manufacturing or commercial enterprise with assets several times larger than its liabilities. Solvency to-day is the possession of the actual cash necessary to run a business; insolvency is the lack of such cash, without regard to the value of assets not cash. Establishments endowed with every qualification for a successful business career are for this reason being forced into liquidation along with the usual crowd of concerns that have been dragging out a miserable existence for years, and needed only a little unfavorable financial weather to carry them off. The situation calls for unusual forbearance on the part of creditors, to avoid the embarrassment of reputable establishments whose management can easily pull through the storm if not too sharply pressed.

Bad Collections a Blessing.

BY A. J.

Being on very confidential and intimate terms with one of my old customers, in corresponding with him I have sometimes mentioned matters in my business that either pleased or annoyed me, though not of special interest to him. Recently in writing him I wound up by saying, "Nothing new at present, but extremely worried over collections, which are very bad." In a day or two I received a letter from him, which, I think, might give some other fellow a hint and a help as it did me. I quote from his letter as follows:

I regret that you find collections slow, but right here is a chance for you to firmly establish some of the best custom you will ever have. By a kind, personal talk with many of these fellows, by giving them your confidence and telling them your needs you will get their confidence in return and some new ideas as well. Here is your opportunity; they don't know anything about business compared with what you know, and by careful attention you can learn their weak points, which will enable you to instill some of the simplest yet most important business precepts and principles into them. These simple foundations of business success are all that many of them lack, for they are industrious and even enterprising, but bad pay for the lack of something which they would gladly acquire if it could be secured without humbling their pride. With your fund of knowledge and wide experience nobody could better than you apply the remedy, but do it in such a way that he will remember you when your hints bear fruit, of which, it is needless to say, your share will not be withheld. Inquiry into the inner affairs of a man's business requires tact. If done conscientiously and a fearless recommendation is given of the needed reform, it will gain you a friend, as well as secure firmly a customer, who will pay better as the plans suggested progress. The reason it is so hard to sell goods to some men who are dealing with another house is more frequently than you have any idea due to just such a past history. To keep your temper and be generous and just under the exasperating influences of tight money and bad collections with men whose business methods are stupidly and radically wrong is difficult, I know. If, however, you are equal to the strain you will be successful in time in making slow payers prompt payers, and the outlay of vitality and mental effort will bring big dividends. It takes a man of wide experience, great ability, generosity and gentle firmness to collect from slow payers and reform them, but it pays to study and fill these requirements. Such a condition in the majority of cases is due to selling your customer more than he can dispose of, and then he is entitled to great consideration from the seller.

STEAM AND HOT WATER.

The Efficiency of a Low Radiator.

BY C. K. PRINCE.

In the use of direct radiation there is a point which, it would seem, is not generally known to the trade, or, at least, if known, is not often recognized or made use of. This point is the increased efficiency which is secured from a low-hight radiator over one of the standard size. The proportioning of the radiation is a detail in the planning of an apparatus for warming which will call for the most careful judgment of the engineer, and it is important that a full consideration be given to all conditions which would influence this estimate, forming, as it does, the basis of computation for the entire work, and particularly for determining that most vital point in any system of warming—the boiler.

The calculation of the amount of radiation to employ for certain work is too often made, practically, a mere matter of guess, but to secure uniform and satisfactory results in this direction a definite and proper consideration must be given to existing conditions, and allowance made for certain detail of the proposed work, such as the character or style of the radiation to be employed, its position, the temperature at which it is designed to carry it, and other features of a similar nature, which have much to do with the success or failure of the work, and a disregard of which (excluding a possible piece of good luck) will insure an ill-balanced and unsatisfactory apparatus.

So far as the style of radiation to be used is concerned, it would frequently seem to be the best way of disposing of the surface in some rooms to put it in the shape of a low radiator, the only objection being that there is not always space enough to permit the placing of what has been decided to be the requisite number of feet, which has been previously determined on the basis of a standard-hight radiator. Has the idea never presented itself that a low radiator was a considerably more efficient arrangement of the heating surface than when in the form of a radiator of the standard hight? Or, in other words, that it would take less surface to do a certain work when this surface is disposed as in a low radiator than would be required were the surface in the form of a radiator of the standard dimensions.

That there is this increased efficiency in the use of low radiation can be readily shown, and the idea may prove of interest and value to the fitter. The reasons are plain and can be readily grasped. The explanation rests on a principle recognized as one of the laws of heat, to the effect that if two bodies of different temperature be placed adjacent or in contact, heat will pass from the warmer to the cooler body until such time as an equilibrium shall be established, and both bodies represent an equal temperature. The amount of heat thus passing in any instant of time to be the greater, the greater the difference in temperature between the bodies. Now in the case of the direct radiator the large part of the heat given out to the room is by convection—that is, by direct contact of the air in the room with the surface of the radiator. The air being cooler than the radiating surface, the heat from the radiator is imparted to it in accordance with the terms of the above laws.

In the circulation thus established by the direct radiator, the colder air at the bottom of the room, meeting the warmer surfaces of the radiator, absorbs some of its heat and begins to rise along the length of the column with an increasing velocity and a temperature which approaches nearer and nearer to the temperature of the radiator, and finally passes off the radiating surface into the circulation of the room. That part of the passage of the air at which the conditions were the most favorable for the absorption of the greatest amount of heat is at the beginning, when the difference in temperature between the air and the surface is greatest and the ascending current of air has its lowest velocity. As it rises the increase of temperature increases its velocity, and the conditions existing during the latter portion of its contact with the radiator are obviously less favorable for the transfer of heat to the air than have existed at any time in its passage. Therefore, it is plain that the larger part of the work is done during the first part of the contact of the air with the surface, and consequently it is done by the surface at the base of the radiator.

Does it not follow that we are in a better position for securing the highest efficiency from our surface when every foot is placed as near as possible under the best conditions for the absorption of the greatest amount of heat by the air, or, in other words, placing it in the form of a low radiator? Furthermore, are not pipe coils recognized as being the most efficient form of heating surface which we employ for warming? Are not the reasons given above in favor of a low radiator the same which will account for this superior efficiency of the pipe surface? Are we not, in using low hight radiation, placing our surface in a form which resembles pipe coils more and more the lower the radiator which we employ? May we not, therefore, expect that in thus approaching a pipe coil in form and arrangement of our surface we are approaching its efficiency in a like measure?

The position in which a low radiator may be placed is also an argument in favor of their more extended use. There can be no question but that the most favorable spot in a room for placing direct radiation is exactly under the windows on the exposure. There is always a strong down current of cold air before the window, and in placing the surface where it can meet this movement before it gets into the circulation of the room gives an opportunity of checking the current which would otherwise pass downward constantly, maintaining a flow of cool air over the floor and forming a consequent source of annoyance and discomfort.

This same point, in regard to the absorption of a larger part of its heat by the air during the first instants of its contact with radiating surface, may be noticed in the use of indirect radiation. Here it is a well-known fact that there is no marked difference in results to be obtained by arranging the radiators in a double tier and causing the air to pass over twice the usual extent of surface. The reasons are that the 6 or 8 inches of warming surface in the first tier of radiators is a sufficient distance to afford opportunity for a thorough warming of the air, and the second tier, receiving the air under so much less favorable conditions for the imparting of any further amount of heat, has but little chance of making any marked difference in the results obtained. This would apply only in cases where a natural circulation of the air is sought. If a mechanical circulation is used, the increased velocity of the current would require a considerable extension of the heating surfaces. The conditions under which an indirect stack is working do not differ to any great extent from those of the direct radiator, so far as the matter in hand is concerned, and this fact may be allowed to put in its evidence in favor of the increased advantage of the disposition of radiating surface in low radiators.

The main argument, of course, against their more extended use is in their cost, but in point of fact the increase in efficiency keeps pace very nearly with the increased cost and thus tends to make all hights equally expensive. In most instances, too, there can be little question but that a low radiator can be made to make a much more presentable appearance in a room than any other arrangement of direct-heating surface, and this, with an understanding of their increased efficiency and consequent lowering of price, should lead to their more general introduction.

English Practice in Hot-Water Heating—XXV.*

JOINTING AND SUPPORTING PIPES.—CHIMNEYS.

The general method of jointing hot-water pipes, when there is a large number of joints to be made, is by what is known as the rust joint. For small works there is now a more general application of the rubber ring, or some of the different forms of expansion joints, these latter being now made in considerable variety and having many good features. Joints are also made with red and white lead and yarn, but this is a more expensive joint; it, however, is not so rigid as the rust joint, and fulfills a use in this respect, as will be seen directly. It is a joint also used with small works, as the little extra expense is then trifling, and it is convenient both in application and in obtaining the materials. The rust joint is cheapest, but not convenient, unless the works are on a large scale, or several jobs are being carried on at once. There are several other different joints, workmen

* Reprinted from the *London Builder*.

sometimes making a joint specially their own. The writer once saw a joint made with old tarred cord and nothing else, and this withstood a pressure of 30 pounds per square inch.

There is a distinction between horticultural and building works in the question of joints, in the fact that the former, in having no hight, produces no pressure, and almost anything will make a water-tight joint, if it does not make a lasting one. With building works, the pressure, if the hight be anything to speak of, quite precludes the use of the plain rubber ring, and the other joints (rust, &c.) must be allowed to set thoroughly hard before the apparatus is charged. This, it is understood, applies to cast-iron heating pipes and coils; what wrought pipe may be used has screwed joints, and will bear very heavy pressures.

The rust joint is made by mixing iron borings (these can readily be procured at about 9 shillings per cwt.) with some sal-ammoniac and sulphur in a powdered form. The addition of these two latter materials to the borings causes a chemical action to set in, and the iron rusts into a hard and solid mass. The rusting process takes place quickly, but it is some days before the action entirely ceases, and this brings about very disagreeable results when the workman is not experienced. The borings, during the change they undergo by the addition of the two substances named, expand somewhat; that is to say, the mass of material exerts an expansive force while the chemical action is proceeding. The result of this is that, as the action chiefly takes place after the borings are calked into the socket, there is every probability of the socket splitting if the joint is not made by a skilled man. There have been vast quantities of pipe spoiled in this way, and it is somewhat fair evidence of experience when a man makes rust joints which remain sound and do not injure the sockets.

Workmen have different ways of calking in this material. The socket is, we may say, never filled with borings only; there is always some yarn used. Some workmen calk the socket half-full of yarn, the remaining half with borings; sometimes it is three fourths yarn just finished off with borings, or it may be the socket is packed with two or three alternate layers of the two materials. A good workman makes his joint quite water tight with the yarn alone, but this material needs sustaining with the iron borings, which go to complete and make the joint permanent. Two-thirds yarn and one-third borings make a good joint.

The proportions of the materials added to, say, 100 parts of borings, are one part powdered sal-ammoniac and two parts powdered sulphur, the whole being moistened and thoroughly mixed. It requires to be made from one to two hours before it is used, but the weather will affect it in this respect. It cannot usually be kept longer than one day without becoming hard and unfit for use.

The red and white lead joint is made by taking the latter material, which is a sticky mass, and adding the dry red lead to it until the mixture is of the consistency of putty. Some of this mixture is taken and has boiled oil added until it is quite liquid, and the ends of the pipes are painted with this, otherwise the putty material will not adhere. Usually the joint is made by calking in alternate layers of yarn and lead, the yarn first and finishing with the lead, and when dry it is a sound and durable piece of work.

The rubber-ring joint is now considerably in favor, as it has many good features, chiefly by its convenient application to certain purposes. A considerable trade is now done in small boilers, which are sent out for amateurs' greenhouses, complete with the pipes, &c., and are so constructed that the purchaser can erect the whole of the apparatus himself. The joints of these pipes, both with the boiler and with one another, are commonly made with a plain rubber ring, and for this purpose it is a great convenience. Then, again, in some large works temporary lines of pipes are sometimes needed, and for this purpose the rubber ring is a positive boon, as it can be used with any ordinary description of pipe. Occasionally permanent works of a large character are carried out with this joint, but it is not a usual practice.

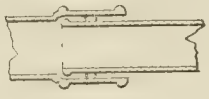


Fig. 101.—Section of Rubber-Ring Joint.

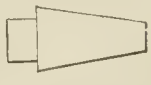


Fig. 102.—Tube Expander.

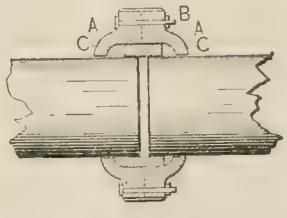


Fig. 103.—One Form of Patented Joint.

The particular convenience of the rubber-ring joint is the expeditious way in which it can be used. It consists of a ring of round india rubber, full ⅛ inch thick, the size varying with the size of the pipe, of course. This ring, which is a little smaller than the pipe, is stretched just on the spigot end of the pipe, and this is then forced into the socket. Its passage in causes the ring to roll, and by the time the spigot is pushed home the ring joint is half way up the socket, as Fig. 101 (section). Instead of stretching the ring on to the spigot, a ring expander can be had, which, when one end is placed in the pipe, permits of the ring being rolled up in it on to the pipe, and this prevents it being put on in an irregular manner or twisted. The tube expander is as Fig. 102. This joint is totally wanting in rigidity, and the pipes need to be well supported.

This and the following joint are what is termed "expansive." What is really meant is, that it is elastic, and considering that every variation in the temperature of the water brings about a movement in the pipes (expansion and contraction), the necessity of such a joint becomes obvious. With the rust and also the red and white lead joint some provision is always made for this, if the pipes extend any distance. With short services no provision is needed. With the two joints named a long, loose socket is provided here and there, and so packed that the pipes can move to and fro in it to a trifling extent. One firm of growers use rust joints, but use a rubber ring for every sixth joint. The expansive force is not extensive—that is to say, in a 100-foot run of pipe we may never get more than 1 inch total extension in length, but the force is certain and irresistible; so much so that brick work bas often been displaced by the thrust. The rubber joints allow for this, and act very successfully.

There are several forms of patented joints that have rubber as the jointing material, and which possess the elasticity just spoken of. It is not necessary to describe them all, but Jones'

Fig. 104.—Iron Supports for Pipe.

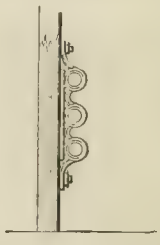


Fig. 105.—Method of Fastening Pipe to Wood Work or a Wall.

Fig. 106.—Roller Supports for Long Runs of Pipe.

ENGLISH PRACTICE IN HOT-WATER HEATING.

patent, as Fig. 103, can be described as an example. This consists of two cast collars, A A, an iron ring, B, two rubber collars, C C, and the whole brought together with the bolts shown. This joint has the advantge of being used without socket or special shaped ends to the pipes; any plain pipe can be jointed, and if the pipe was badly or roughly cut a joint might still be well made. This saves waste of cut pipe, as some of the patented joints depend upon one of the ends being made to suit the other. A joint like this, Fig. 103, permits of any length of pipe being taken out and replaced with new if needed without disturbing the remainder. This would prove very convenient if, after laying down a long run of pipe, a bad leakage was found somewhere in the middle. With the ordinary joints a mishap like this is provided for by putting running—*i. e.*, loose—sockets here and there. All kinds of rubber joints are more expensive than the rust joint, but if any one wishes to compare the cost between the two, let it be remembered that a rubber joint can be made in an exceedingly short space of time.

Pipe Supports.—In nearly all horticultural works the supports are little piers of brick work, and for such purposes nothing better is needed. It is essential that the brick piers be on a good foundation, or their own weight and the weight of the pipes may cause them to sink, with the most disagreeable results, even if the joints in the pipes did not become fractured. For those situations where the pipes are seen iron supports can be used, these, as Fig. 104, being of better appearance and very safe. They are also exceedingly cheap, being mere plain castings. When pipes are carried along a wall or wood work they are sometimes strapped on, as Fig 105. There is nothing unworkmanlike in this.

When the runs of pipe get somewhat extensive, then, in addition to elastic joints, there must be some provision on the supports themselves to allow for the movement that takes place. With brick piers a piece of small iron pipe or round rod iron will form a frictionless bearing ; or if iron supports are used, they can be purchased, as Fig. 106, or a smith can make something with rollers for the pipes to rest upon. If such a provision is not made, there is every probability of some harm ensuing. But, as just mentioned, this need not be thought of with medium and small sized works.

Chimneys.—Reference has been made to these from time to time in the previous papers, and very little remains to be said. We have fully pointed out the necessary features with chimneys in building works, but there needs to be given the rules usually followed in making the chimneys to boilers attached to glass-house works, those which stand away from buildings. In giving the following sizes it is supposed the chimneys are brick built, not sheet-iron pipe. Earthenware pipes, however, answer very well for this purpose as a rule.

The minimum hight of chimney should not be less than the length of the flues that lead up and down the boiler; that is to say, a 4-foot saddle boiler, having flues once up and down its length, should have an 8-foot chimney. If the boiler was one having the flues traversing its length three times, then it should have a 12-foot chimney. Let it be clearly understood that these are the minimum hights. If we made the chimney of less hight than this, the draft in it would be insufficient to carry away the smoke or gases and cause a proper degree of combustion in the furnace. Sometimes a chimney a little lower will work passably well, but it is best to calculate as just described for a minimum hight.

Every opportunity should be taken to have a higher chimney wherever possible; better and more reliable results are attained; but of course in private gardens the chimney, beyond certain limits, is strongly objected to on account of its unsightliness in most cases. With professional growers sightliness may probably be the last thing to be considered—profit has more consideration—and higher chimneys are the rule.

The area of the chimney should bear some relation to the size of the boiler, and the following sizes are reliable:

	Area of chimney in square inches.
For Trentham boilers 8 to 10 feet long..	400
For saddle boilers 6 feet long.....	300
For saddle boilers 4 feet 6 inches long..	250
For saddle boilers 3 feet or smaller....	200

These areas are for the minimum-hight chimneys just referred to. As the hight is increased the area can be reduced. For low chimneys the area cannot be too roomy, it is essential, and at the point where the flues from the boiler enter the chimney the passage should not be choked in any way. It will be understood that as the hight of chimney is increased the draft is more keen and a less area will answer, but small area must be avoided with very low chimneys. If the hight of chimney was double the minimum given, then the area could be reduced, say, one-fourth.

HEATING NOTES.

The United States Heater Company, Detroit, Mich., are distributing among the trade a postal card, upon the back of which are several illustrations of radiators for steam and hot water. The engravings show ordinary curved and dining room radiators, while reference is made to column, corner, window, stairway and low and extra high radiators.

W. H. Pennell, the hot-water engineer of the Model Heating Company of Philadelphia, is a delegate to the Christian Endeavor Convention at Montreal, and will visit his friends at his old home in Boston on his return trip.

The Richmond Stove Company of Norwich, Conn., have just issued from the press a very neat catalogue of a size convenient to carry in the pocket and relating to the steam and hot-water heaters which they manufacture. The little volume of 80 pages of printed matter is bound in red leather covers with a side title in gilt letters. The matter consists of illustrated descriptions of the several lines of heaters made by the company, together with tables giving valuable information in connection therewith. There are suggestions to the fitter, a statement of some of the causes of failure of heaters to operate satisfactorily, a specification and contract for the Richmond steam heating system, pages of memoranda of radiators and of trade discounts, as well as suggestions in estimating. A useful feature of the little work is found at its close, in the shape of a number of blank pages which may be found useful for a variety of purposes.

Knight & Jillson, Indianapolis, Ind., a large and pushing firm in steam, gas and plumbers' supplies, have recently secured a store adjoining their old stand. The new addition is two stories and a basement, 60 feet front and 100 feet deep. Steam gauges, National Tube Works wrought iron pipe, solder, hose, pumps, lead pipe, fittings and brass goods in full line leave no order unfilled, whether from the natural gas fitter, steam and hot-water fitter, mill and factory man or plumber, either in large or small quantities.

The Richmond Stove Company, Norwich, Conn., issue an illustrated and descriptive catalogue of the Richmond sectional heater for steam or hot water which they manufacture. On the front cover of the pamphlet a general view of the heater is shown. In the introductory pages the advantages of the Richmond sectional heater are dwelt upon, then a description is given, with illustration, of the brick-set form, followed by similar accounts of the portable forms of heaters for steam or hot water. Later on a sectional view of the apparatus is given, then a view of the grate and likewise of the separate sections of which the heater is composed. Tables give all dimensions, capacities, prices, &c., while at the end is a long list of testimonial letters and brief reference to some of the other Richmond heaters.

The firm of Pancoast & Maule, dealers in tools and steam supplies, Philadelphia, were dissolved July 1 by mutual consent of the partners. The firm had been carrying on business for 23 years, although the partners, Henry B. Pancoast and Francis I. Maule, have been business associates for 31 years. The business of the late firm will be settled by Henry B. Pancoast, who will also continue in business in the same line, at the old stand, under the firm name of Henry B. Pancoast & Co.

The Retailer's Opportunity.

In the present financial condition of the country complaints are frequently heard of the difficulty of making collections, and many manufacturers and wholesale merchants are a good deal inconvenienced, if not positively embarrassed, by the tardiness of their customers in the matter of remittances. This perhaps in many cases cannot be avoided, as retail merchants find it a difficult matter to collect their accounts, inasmuch as their trade is affected by the conditions which prevail so generally in the financial centers.

In many cases, however, retailers are not directly or very seriously affected by the financial distrust which prevails in other parts of the country, and by giving careful attention to the matter of collections, and by a little special effort in this direction they might be enabled to make prompt payments for their purchases. In this connection it should be remembered that at a time like the present the prompt payment of bills on the part of retailers who come directly into contact with the consumers will do something toward relieving the stress of the situation, and will put the large distributors of goods and the manufacturers in a more easy financial position. Something will thus be done toward improving the commercial situation and bringing about a more satisfactory condition of things.

There are many retail houses who take a commendable pride in meeting their obligations promptly and paying their bills as soon as they are due. This class of purchasers are, it is needless to say, regarded with more favor by those from whom they buy than others in the trade who are careless in this matter, letting a ten-days' invoice run for 20 or 25 days, and making a tardy remittance two or three weeks late for goods purchased on 30 days' time. Prompt payment is recognized as doing much to make the purchaser solid with the seller and entitling him to close figures, the best attention and any special favors which may reasonably be expected.

At the present time and during the past month or two we know that some retail houses have found it necessary to make unusual efforts to settle their invoices on maturity, but they have regarded it as a matter of pride and almost of honor to send their drafts as usual when the account has become due and payable. If they have not in all cases been able to do this they have sincerely regretted it, but their regret has been tempered by the reflection that they used every effort and were prevented only by the very exceptional financial conditions existing.

We are led to refer to this matter to impress upon retailers throughout the country that the present financial stringency gives to them an opportunity which is not afforded in times when money is easy. Promptness in payment, always appreciated, will be doubly appreciated now, and the heart of the jobber or manufacturer will be warmed toward the retailer whose remittances come on time.

ROOFING AND CORNICE.

Laying Steel Roofing.—IV.*

BY L. S. BONBRAKE.

FINISH AT EAVES AND GABLES.

Several plans are used for eave finish, among which we find the most common is to allow the metal to project $1\frac{1}{2}$ inches over eave board beyond the end of seams. Turn projection down as in Fig. 22, and nail 1 inch above extreme end, at intervals of from 2 to 3 inches, after which the 1-inch tongs can be used to turn the end slightly outward, as in Fig. 23, thus throwing the water away from the building.

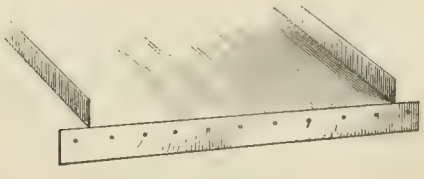


Fig. 22.—Eave Finish.

Fig. 23.—Eave Finish with Outturned Edge.

Fig. 24.—Edge Folded Back on Strip.

Fig. 25.—Edge with Second Bend.

can be avoided by either raising the edge with a wood strip, or a guard can be formed entire from the roof strip, by turning the metal wrong side up, and throwing a 2-inch edge backward upon itself the entire length of roof strip. Then return the metal, and with the 1-inch tongs form a T-flange from the folded edge, Fig. 27. To accomplish this the sheet must be raised or lifted slightly when turning the flange. It will be understood that when seams are to be formed and edges turned, except at hip and combs, the strips are notched or cut to the depth of the seams, and back on the metal to a point the width of the edge to be turned.

When solid sheeting is not used for a surface on which the metal is to lay, it should be solid at least a foot from

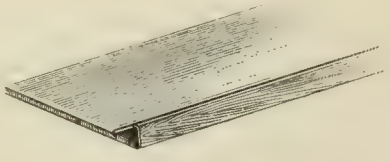


Fig. 26.—Edge Nailed to Eave Board.

Fig. 27.—Tee Flange Formed from Folded Edge.

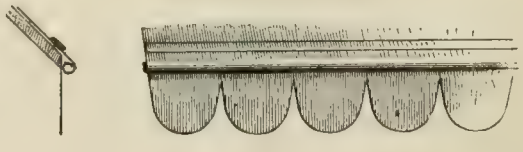


Fig. 28.—Enrichment Finish for Roof.

LAYING STEEL ROOFING.

Another form is to first turn the roof strip upside down, then turn an edge, or fold, with 2-inch tongs, back upon the sheet, as in Fig. 24. Then, with the inch tongs, turn an edge at right angles with the strip, as in Fig. 25, and when the sheet has been returned to its proper position a projection will have been formed, which can be nailed to eave board, and will prevent water from passing over the nail heads, as in Fig. 26.

The same result can be obtained by nailing a separate strip of metal around the entire eave, allowing it to project the distance desired. The roof strips can be hooked or secured by forming an edge over and under the projecting strip.

The roof at the gables of a building is ordinarily finished by turning an edge on the metal at right angles with the 1-inch tongs, and nailing as at the eave. At times, however, trouble has been experienced from this way of fastening, from the fact that if the roof should dip toward the gables the rain will run over the edge and blacken the cornice, forming streaks that spoil the effect of paint. This the eave up the roof, to provide a place for nailing when hanging the gutter. A board should be used along the comb, and hips and valleys should be sheeted solid, in order to finish the seams smooth and evenly.

A neat and practical manner of finish for roof at the edges of portico or ledge, and one that will prevent water from passing over cornice, is to nail an enrichment around the edge, of width as desired for down projection. Form a bead upon a strip of metal, and allow it to project over the enrichment, and back upon the ledge 1 inch, as in Fig. 28, with edge turned, under which it can be nailed, and to which the roof can be hooked and fastened. If it is not convenient to get enrichment, an ordinary piece of scolloped metal, which will answer every purpose, is easily made, and if properly painted presents a handsome appearance.

Nails should not be driven through or exposed on the surface of a roof. Soldering over nail heads is but a temporary arrangement, as expansion and contraction will draw the metal, burst the solder and cause leaks. In conclusion, we cannot refrain from making mention of an item we have read in almost every roofing catalogue that has

* Copyrighted, 1893, by L. S. Bonbrake.

come under our observation, to wit: "Our roofing can be easily understood by any ordinary mechanic, carpenter or builder, and can be laid by an inexperienced workman."

This may be true. But how is it laid? With seams gaping open up the roof; nails driven through seams in the body of the roof, to make them lay flat; the comb straddled and pounded full of nails; the eave not nailed at all, or, worse yet, nailed from the top of the roof. With all these, if the roof should leak, it is the fault of the material (?).

It is as important to have a skilled workman to lay a perfect steel roof, no matter of whose make it may be, as it is to have skilled artisans to provide the steel from which the roof shall be made. A diversity of plans of construction has provided simplified forms of laying. Yet the skilled roofer, whose business it has been to study his work and educate himself to meet the many difficulties as they arise, is undoubtedly better qualified to lay a steel roof that shall give entire satisfaction to all concerned than a workman in some other vocation.

If the roof is well and properly laid it is an advertisement tending toward the advancement of the steel roofing industry. If poorly laid it is yet an advertisement, but for the use of some other material.

(THE END.)

Paint for Exposed Iron Surfaces.

From X. X.—In *The Metal Worker* of June 10 under the heading "White Lead Paint for Tin," you quote a correspondent "as doubting if anything will beat a good coat or two of white lead and linseed oil." I have had some experience with graphite paint and do not believe any paint made can equal it for durability and preservative qualities when applied to tin or shingle roofs, tin leaders, and tin or iron work generally. A durability of from 10 to 15 years is claimed for this graphite paint on tin roofs, and one who has used it says he has a roof which he painted 20 years ago with it and repainting is not yet necessary.

FLASHINGS.

J. FOERSTER & SON, 806 East Fifth street, New York, have recently completed the tin, slate and copper work on the Roman Catholic Trade School, Madison avenue, Fifty-first and Fifty-second streets. The work also includes the galvanized iron ventilating shafts running from all the classrooms. A special feature of the sheet-metal work on this building is the copper work, which includes the finials, crosses, dormers and a large bay window on the rear of the building, the Gothic panels of which are entirely hammered by hand.

THE METAL STAMPING & SPINNING COMPANY of Grand Rapids, Mich., have recently begun the manufacture of architectural ornaments, making special designs. They also turn out copper and brass work, and make a full line of non-rusting goods, which they guarantee to be rust proof. A circular just issued by the company gives a number of illustrations of the company's goods, such as finials, balusters, rosettes, capitals, moldings, corner pieces, urns, kitchen utensils, milk cans, &c.

THE LONG STEEL ROOFING & CORRUGATING COMPANY of Indianapolis, Ind., during the past three months have made material increase in their facilities for supplying the trade, having moved to new quarters and doubled their producing capacity for steel roofing, siding and ceilings. They are furnishing for the Electric Car Company of Brazil, Ind., a standing seam steel roof of 200 squares, an imitation brick front and corrugated siding for their building. A shipment of roofing and siding has been recently made to a large flour mill and grain elevator in Arkansas.

THE SEMI-ANNUAL MEETING of the National Iron Roofing Association, which was to have been held on July 11 has been postponed to July 18, the place of meeting being the Hotel Plaza, Piqua, Ohio.

Prize Competitions

$25.00.

The following competition is yet before our readers and will remain open until the date named:

Prize Competition No. 27.

SUBJECT:

Local Associations of Merchants.

It has been found feasible to form associations in many places for the purpose of securing more friendly relations among competitors and reaching an understanding in regard to matters of common interest. Among the good results referred to as coming from such associations are the following: Overcoming petty jealousies; cultivating a spirit of fraternity; listing of undesirable customers; an understanding in regard to time of presenting bills; putting in operation early-closing movements; agreement as to the prices at which goods are to be sold; mutual accommodation in supplying goods which one merchant may be temporarily short of, &c. The subject is thus evidently a broad one and of a good deal of practical interest. In discussing it the following points are suggested:

Whether it is desirable to have such associations;

How such associations may be organized;

The objects to be accomplished by them.

It will also be of interest to have any information in regard to the practical working of such associations.

This competition will remain open until July 8, 1893.

The following prizes will be awarded:

First prize	$12.50
Second prize	7.50
Third prize	5.00

The prizes will be awarded for answers which, in the judgment of the Committee of Award, are most suitable for publication and of the most general interest

We reserve the privilege of extending the time on the competition in case the contributions received are not of sufficient number or merit for the committee to award prizes. This competition is open to every one, and it is hoped that there will be a general response from business men. We shall have the privilege of publishing any or all of the contributions received.

Replies are to be received not later than the dates on which the competitions close. They should be addressed as follows:

DAVID WILLIAMS,
96-102 *Reade street,*
New York.

Prize Competition No. 27.

The committee to whom the contributions in Prize Competition No. 17 were referred have awarded the prizes as follows:

First Prize to M. W. CARLETON, Cleveland, Ohio.

Second Prize to L. W. SPRAGUE, Greenville, Mich.

Third Prize to W. T. WARSOP, Fairport, N. Y.

Foreign Patents in Italy.

In the Italian patent law of 1859, says an English exchange, two kinds of patents are mentioned—namely, "Patents of Invention" and "Patents of Importation." Some time ago the question was raised before the Italian law courts as to whether an Italian patent for an invention already patented in a foreign country, and taken out as a patent of invention instead of as a patent of importation, would be valid. In two cases the Court of Cassation of Turin decided that such patents were not valid, and in another instance the Court of Cassation of Rome decided that they were valid. The Court of Appeal of Turin subsequently gave a similar decision as the Court of Cassation of Rome, and as the question was again brought before the Court of Cassation of Turin the latter recently gave its decision, canceling its two prior decisions and admitting that Italian patents for inventions already patented in a foreign country are valid whether they are taken out as patents of invention or as patents of importation. This is a question of great importance, for had the former decisions prevailed the large majority of Italian patents taken out by foreigners would have been void, they having been generally always taken out as patents of invention. The only difference between a patent of invention and a patent of importation is that the former can be granted for a period of 15 years, while the duration of the latter is limited to the number of years for which the prior foreign patent has been granted, not exceeding 15. With an application for a patent of importation it is necessary to file an official copy of the prior foreign patent vised by the Italian Consul.

Camels are coming into use in large numbers in connection with the mining industries of South Africa, as they are found to be impervious to the insects and diseases which prove fatal to horses and bullocks in that country. In Australia, too, the camel is fast superseding other draft animals in the barren deserts of the interior.

THE LETTER BOX.

Business Directory.

From L. M. W., *Delaware, Ohio.*—For some time back I have been making up a business directory, and send in my plan for the benefit of your readers. Whenever I see an advertisement or a notice in *The Metal Worker* in Odd Plates, Traps and Vents, Trade Notes, or anywhere else in the paper, of a house dealing in or making a specialty of some particular article or line of goods, I cut it out. Then I paste them in a book which I arranged with a double index. The first index is an alphabetical list of different articles, as stoves, tin plate, tools, supplies, &c., and from it I can see that sheet iron is on pages 12 and 13, where I have pasted all the different clippings that make reference to sheet iron. In the back of the book is another index with the name of the firm, and opposite it the page where the clipping which refers to them can be found. Often one advertisement or notice is entered in the first index under a dozen different heads, so that a firm which sells solder, steam valves and pipe wrenches, besides many other distinctly different things, can be easily traced. Of course, the clipping can only appear in one place, but on the pages devoted to each of the other heads a note tells where the clipping is to be found and to what house it refers. It has not been much trouble to keep the book, and it is far more convenient than to hunt over a file of the paper. After a season specially devoted to one line of work, much of the necessary information of other lines that would, naturally, be forgotten is securely stored here. As a directory of unusual goods, for which there is an occasional call, and which are a little out of my line, it is simply invaluable.

Trouble with a Well Cooler.

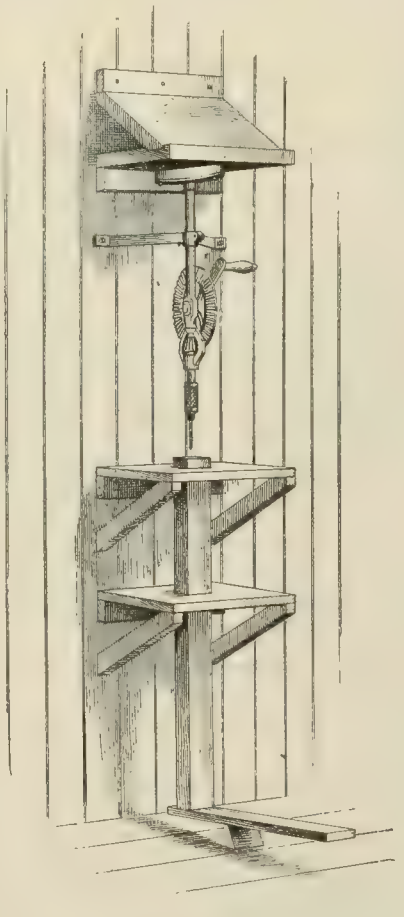
From E. H., *Nyack, N. Y.*—With regard to the well cooler of "P. R. F.," mentioned in the issue of the paper for July 1, I would say that if there is nothing in the boiler to prevent it, the warm water will follow a direct line from the inlet to the outlet pipe without circulating through the cold part of the boiler. By extending the inlet pipe nearly the length of the boiler inside and extending the outlet to nearly the other end the trouble will probably be overcome. Great care, however, should be taken to have the outlet pipe draw the water from the bottom of the boiler.

Laying a Flat Tin Roof.

From J. H., *Harrisburg, Pa.*—I notice in *The Metal Worker* of July 1 an inquiry from "C. S. P.," with regard to the best method of laying a flat tin roof. According to my way of thinking, the best plan is to put the tin together in rolls of, say, 28 sheets. Care should be taken to have the tin straight and then turn up 1 inch and cleat down well, say one cleat about every 6 inches, and two nails in each cleat. Then use a pair of $1\frac{1}{4}$ tongs, turn up, and then take a small seamer and single seam tight. Hammer down and solder, and the result will be a good roof. A satisfactory job will not result if one sheet is put down at a time. The plan described is the way I follow, and I have in mind a roof I put on 20 years ago, and it is as good to-day as when the roof was laid. I would also say that there has been no repairing done to it. The correspondent says that his roof is 50 x 80, with a fall of 4 feet in 80. I would say that when he gets within 20 or 25 feet of the top he can make a standing seam, and flatten up that far.

A Sensible Drill.

From C. E. M., *New Jersey.*—Knowing that in many shops there is no regular upright drill, and that its need is



A Sensible Drill.

sorely felt when a breast drill is the only means of drilling a lot of holes in an old stove plate which has to be mended, I send you a sketch and description of how I have made my portable breast drill do good service as a stationary drill. Against the plastered wall I found a stud by hammering, and to it at right angles I fastened a piece of 2 x 4 inch white pine extending out 18 inches, with a notch in the top side to hold a brace of the same material, which was also fastened to the stud and a cleat fastened over it so as to prevent the outer end from raising when the strain comes on it. I drilled two holes in the breast plate of the drill and with screws fastened it to the horizontal brace. To hold the drill true in position two iron braces $\frac{1}{4}$ x $\frac{5}{8}$ inch were bolted to it, running off at an angle to the wall, where they are fastened to other studs. By unscrewing the one bolt in the braces and the two screws in the breast plate the drill can be quickly removed to be used on work that cannot be brought to it. Under the center of the drill is an upright piece of solid wood 3 x 3 inches, which works plumb up and down through neat holes in two other braces which are fastened to the wall in a manner similar to the top brace and very securely, as on their being true depends the true working of the upright. The upper end of the upright is within 2 inches of the drill bit, while the lower end rests on a lever at the bottom, the lever working over a triangular piece of hard wood, as shown.

By placing the work to be drilled on the top of the upright and one foot on the lever the work can be forced up against the drill with the desired force, while the drill can be turned by hand. Having secured excellent service with my device, and thinking some others might appreciate its value, I tender it for the appropriation of all who desire.

North Pole Ice-Cream Freezer.

From H. & B., *Allentown, Pa.*—Will some one please tell us through the columns of the paper who manufactures the North Pole ice-cream freezer?

A Water Back Question.

From W. F. S., *Bayfield, Wis.*—Please help me out in a matter that has given me considerable trouble. I put in a bathtub for a customer, and as they had no range for heating the water but a large No. 10 common cook stove I made a water back out of $\frac{3}{4}$-inch gas pipe, using five $\frac{3}{4}$ close return bends, and placed it in front of the heavy sectional cast-iron fire back in the stove, the water back being the full size of the fire back. Since putting it in the oven will not bake at all on the top and, also, bakes very much slower on the bottom. They use coal exclusively the year round and have exceedingly hot fires, yet the oven will not bake. The stove always baked well before the water back was put in. The reason I placed the water heating apparatus at the back was: 1. They wanted all the hot water they could get; 2, by putting it in front it would interfere with the drafts of the stove, and 3, I saw several different styles of ranges with water backs instead of fronts and thought if they baked all right this one should. I have heard that occasionally there is difficulty in baking in ranges so constructed.

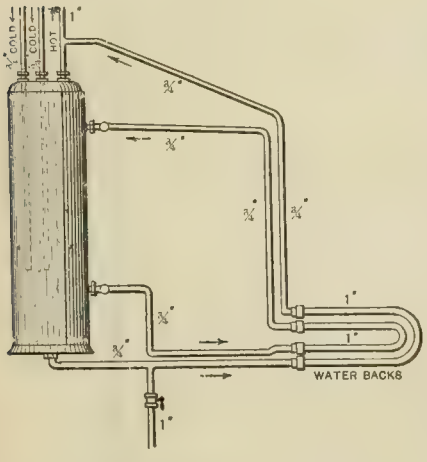
Note.—It is not unlikely our correspondent's difficulty is due to the fact that the water back takes out so much heat from the stove fire that not enough is left to bake suitably. He intimates that a great deal of hot water is used in this house, and it is needless to point out that if this is so, the great part of the heat of combustion of the coal is carried off by the water, and consequently does not go to the oven. We can make no suggestions except to

remove the water back or else increase the grate area. If any of our correspondents can offer better advice we will be glad to hear from them.

A Suggestion in Water Backs.

From A. H. F., *Lancaster, Pa.*—I am an apprentice and would like the readers of *The Metal Worker* to give me their opinion of this boiler and range connection, which I think would be a great advantage where the water back of a single range is not large enough, and where it is not desired to go to the expense of connecting two water backs to the boiler. The water front is made of 1-inch pipes. I think when put in as shown in the sketch they would not take up any more room than a cast water back and would give more hot water.

Note.—We have reproduced our correspondent's sketch, as it is an interesting modification of the ordinary water back, but we fail to see that it has any



A Suggestion in Water Backs.

special points of merit. The fact of the matter is, the heating power of the water back depends upon the surface it exposes to the fire, provided there be connections of suitable size between it and the range boiler. In the present instance a double coil, giving the surface of four lines of pipe and then connected by flow and returns of suitable capacity, would, we think, have fully as much heating power as the double arrangement shown.

Cold Air from Hall.

From WESTERN.—When locating a heating furnace, the expert furnaceman is supposed to devote a portion of his talent to the selection of a proper opening for the cold-air box. If the house is properly situated, the north or west side of the building is selected, and the cold-air box made equal in area to three-quarters of the total area of all the hot-air pipes. Under such favorable circumstances the furnace is supposed to operate in a proper manner and furnish the desired amount of hot air to each register. Does it do so? If the cold-air opening is on the north side of the house, during the prevalence of a north wind the opening will receive an unlimited supply of cold air, and if there is no one about the premises who has the interest of the furnace sufficiently at heart to close the opening by means of a slide or damper that should be provided, it is probable the cold air will be blown through the furnace before it becomes heated. Under such conditions the inmates may conclude that the name "hot air" as applied to the furnace is a delusion and a snare. The wind may change around and blow from the west. The result of this change will be that little if any air will enter the cold-air opening, regardless of how the slide or valve may be arranged, as the air will pass rapidly by the opening. The furnace may be filled with fuel and driven to its greatest capacity, yet the supply of hot air that comes out of the registers is not sufficient to warm the house. The inmates may wonder why, with a strong wind and a good fire, so little heat is given out.

The wind may change again and blow from the south. As this is supposed to be a warm wind, the people who inhabit the residence may fondly anticipate a change for the better in the furnace, but as the wind is from a direction opposite to the cold-air opening, not only may the air refuse to enter, but a suction may be formed sufficiently strong to draw air out of the cold-air opening. Each crack and crevice about windows and doors on the south side will then admit its share of air, which being colder (?) than the air in the house will have a tendency to flow along the floor until a register is reached, then down and out through the cold-air opening. Under such conditions the slide in cold-air box may be closed to prevent air from escaping, but there appears to be no way by which the air may be made to enter. When there is an east wind then the result is about the same as when the wind is from the west—it will blow directly across the cold-air opening and refuse to enter.

Some furnacemen endeavor to avoid the above difficulties by running a cold-air box from the hall to furnace, and perhaps connecting this box with the one from outside; then, in case the outside box fails to operate, the inner is used. This method may operate very well providing there is some one about the house who will devote sufficient time and attention to the management of the furnace. This much-to-be-desired person is seldom at hand, and in the majority of cases the furnace should be arranged in such a manner as to operate properly without an engineer or educated attendant.

There is another method in vogue among furnacemen by which they endeavor to overcome the difficulties encountered by the use of an outside cold-air supply. This consists in taking the air supply from the basement or cellar. This method is not to be commended, as it is difficult to get a proper air supply; besides, the dust and dirt from fuel and ashes are liable to be taken to the upper rooms by the air drawn through the furnace.

Those who desire to set a furnace in such a manner as to give satisfaction under all circumstances cannot do better than to take the cold-air supply from the hall or some convenient room. It is recommended that the duct leading from the hall to furnace should equal in capacity the total area of all the hot-air pipes. This will afford an abundant flow of air to the furnace, as all cold air from the floors will be drawn to the hall opening and then through the furnace, where it will be properly heated. An abundant supply of fresh air will be derived from the numerous cracks about doors and windows, and as this air will naturally flow in the direction of the cold-air opening in hall, it will become heated and returned to the rooms. In some cases it may be found expedient to take the air supply from some room besides the hall. In such a case this second inlet should be on the side opposite the hall inlet, and a partition placed between the two inside the furnace, and extending part way up the sides.

It has been the custom for years with some furnacemen to always use a cold-air box from outside in connection with a heating furnace, and such persons may not feel inclined to adopt a different method. They may be surprised to learn that for a number of years past it has been the practice with those who have done the most successful furnace work to dispense with the outside connection and take the air supply for furnace from a hall or suitable room. In numerous instances where furnaces have failed to operate properly when the air supply has been taken from outside, by changing the inlet so that the air would be conveyed from hall to furnace a great improvement has been observed in heating and a reduction made in the consumption of fuel.

Note.—From the standpoint of sufficient air supply our correspondent has presented a good argument, but we believe, nevertheless, that there are many furnacemen who will stick to the old plan in spite of its disadvantages. A frame house, especially of the rickety variety in the country, is well ventilated through the cracks about windows and doors, but a brick residence in the city is quite a different structure. Fresh air must be provided at any cost and it is fully as necessary as warmth.

Zinc Culinary Utensils.

From E. S., *Philadelphia.*—A visit to the cheap and other stores shows one many articles placed on sale that are coated with zinc. While ash pails and coal hods can be made of galvanized iron without injury to their usual contents, the same cannot be said of water buckets, dippers and other articles used in the kitchen. The highly decorated ice-water tanks may please the eye, but many of them are lined with zinc or galvanized iron. Zinc is acted upon by most waters, and may be detected in those which have been stored in galvanized-iron or zinc tanks. The corrosion is especially active if the coating is imperfect. Theodore G. Wormly, M.D., says: "As metallic zinc is more or less acted upon by certain articles of food, especially such as contain free organic acids or fatty matters, its use for culinary operations is not altogether free from danger. In an instance in which we were consulted, a family, consisting of eight persons, suffered with symptoms of zinc poisoning, occasioned by the use of apple-butter prepared with cider, which had been concentrated in a galvanized-iron pan. On chemical examination, the concentrated cider was found to contain 1.14 grains of zinc oxide in each fluid ounce."

Steamer for Bugs.

From SCHOOLFIELD, VASS & Co., *Danville, Va.*—In reply to "A. L. H.," of Pocahontas, Va., who inquires in the issue of the paper for June 24 concerning a steamer for bugs, would say that we are in a position to supply his needs.

State employment of convicts in road-making, which has been tried in New York State, is very generally approved and recommended for adoption as a step toward obtaining better country roads, and also because this occupation will not compete with free labor, as is the case with other prison industries.

TIN PLATES.

Plant of the Morewood Tin Plate Mfg. Company, Elizabethport, N. J.

Morewood is a name which has long been identified with the tin-plate industry of Wales, the founders of the well-known firm of E. Morewood & Co., now operating extensive mills at Llanelly and Swansea, having been among the pioneers of the manufacture in that country. The brands of tin and terne produced by the Morewoods are among the most widely known and appreciated plates in the market the world over. The firm's interests are now promising to become equally prominent in the New World. Promptly recognizing the fact that the making of tin plates was an industry inevitably bound to secure a permanent place among the manufactures of the United States, Messrs. Morewood wisely arranged for the establishment of branch works in this country.

To that end J. H. Rogers, the managing partner of the firm, crossed over to America a little more than a year ago, and as was announced in *The Metal Worker* at the time, secured property at Elizabethport, N. J., for the purpose of erecting there a tinning plant in which to coat black sheets rolled at the firm's Welsh mills. Subsequently a further and much more extensive investment was made in the purchase by the firm of a large tract of land in Gas City, Ind., with the view of erecting at that place a complete tin-plate manufacturing plant where the whole process of manufacture, from the breaking down of the raw material and its conversion into steel sheets for tinning, should be conducted. This plant, which is planned on a very extensive scale, is now in active process of erection, and the tinning department is ready to begin operations.

ELIZABETHPORT WORKS.

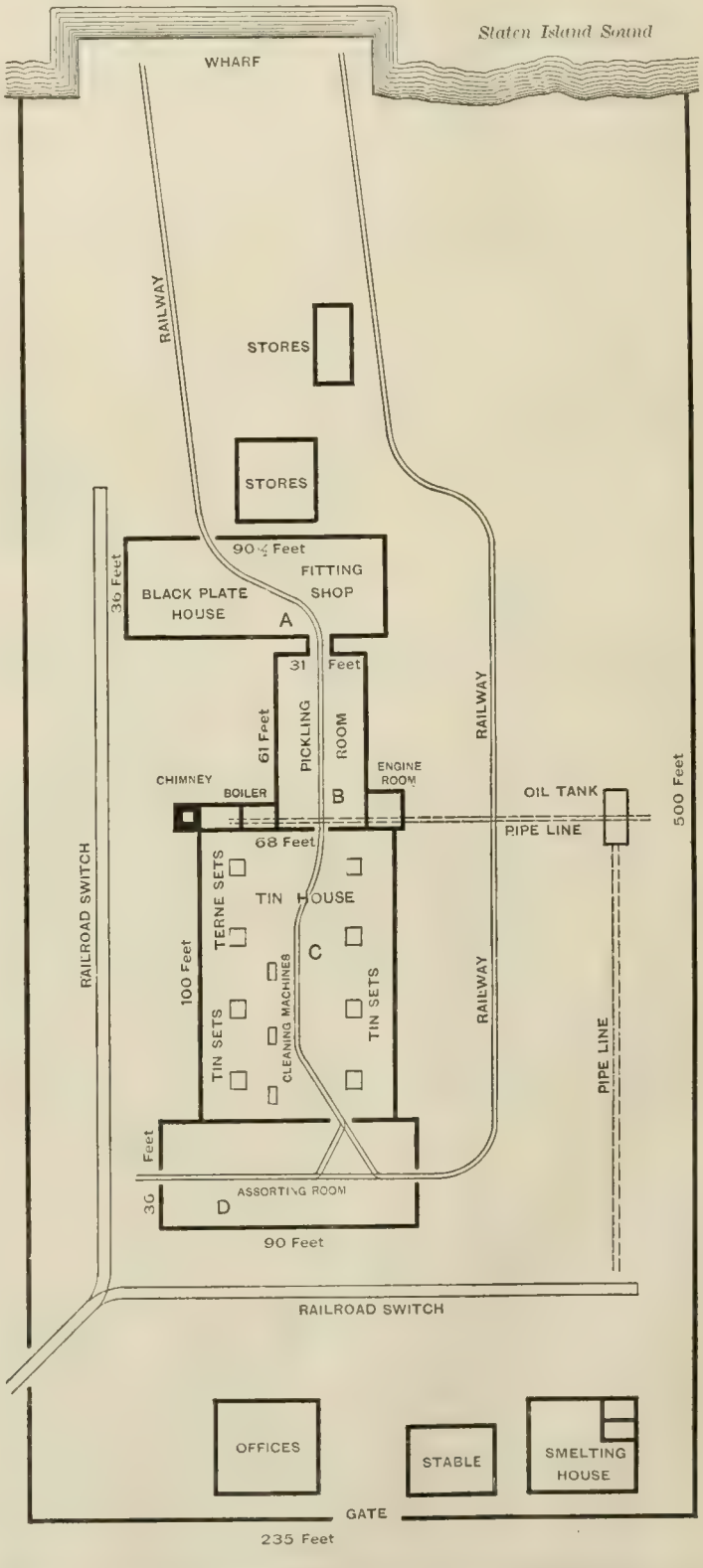
It is not, however, with these works that we purpose to deal at this time, but with the initial plant nearer home, which was first put into operation some eight months ago and which is to-day in full work, yielding a weekly output of 5000 boxes of tin and terne plates.

Although surpassed in size by a few similar establishments in the United States, the Elizabethport plant of the Morewood Tin Plate Mfg. Company, as a tinning plant pure and simple, is, in many respects, a model one. The company being, as we have stated, an affiliation of an old-established concern on the other side of the water, and having the advantages of a thorough knowledge and lengthened experience in the manufacture of tin plates on the best principles back of them, would naturally enter upon the business here under peculiarly advantageous conditions. Consequently, we find the works, as to plan and general arrangements, all that a tinning establishment should be.

The factory was built under the personal supervision of Mr. Rogers, in a remarkably short time, the first pots having been put into operation in little more than four months subsequent to the purchase of the ground.

LOCATION AND SHIPPING FACILITIES.

The location of the buildings is excellent, affording the most favorable facilities for shipping by land and water. They stand in a 3-acre lot at the corner of Bay Way and Front street, Elizabethport, the rear of the works extending to the shore of Staten Island Sound, where a clear water frontage of 235 feet has been secured. Side tracks, connecting with the line of the Central Railroad of New Jersey, enter the premises, as shown in the plan view



Plan of Works of Morewood Tin Plate Mfg. Company, Elizabethport, N. J.

given herewith, and give the necessary means for shipments to the West. The bulk of the product is, however, transported by water, and the raw material and supplies are received by the same channel, the company's own lighters, fitted with cranes and all appliances, being used for this purpose. A wharf has been built on the water face, where loading and unloading is done, the material being run to and from the shops in hand cars over a double track, which traverses the entire round of the establishment.

BUILDINGS AND THEIR CONTENTS.

On the accompanying plan will be found the general disposition of the works, with the arrangement of the various buildings, &c. These are entirely fire proof, being formed of a structural iron frame work, covered with galvanized corrugated sheets. The stacks are of brick, and every precaution has been taken to obviate fire risks in all parts of the plant. The structures are placed in a rectangular plot, surrounded on three sides by a high wooden fence and bounded on the fourth by the water. Ample space has been left for further extensions of plant, as time and trade may render desirable. Nothing is cramped, yet all is compactly arranged.

The raw material, on being landed, is transferred to one of the stores marked on the plan. In the case of black plates, which require the largest amount of space and the most care, storage room is found in the first of the main buildings. Other storehouses for pig tin, palm oil, bran, packing boxes and the various requisites, being located between the shops and the wharf. The rest of the building (marked A on the plan) is used as a fitting shop where the necessary repairs and machine work are carried out. The adjoining building, B, is the pickling room, which holds a Hutchins' patent pickling machine having a capacity of about 1000 boxes a day. The apparatus, which is worked by a stationary engine, operates three cradles of yellow metal attached to arms revolving round a piston working in a vertical cylinder. Large pickling and swilling tanks are placed on either side. The cradles, when immersed in the vats, are given a simultaneous up-and-down and side motion, so as to thoroughly wash the plates, the frames of the cradles resting on the edge of the vats, being fitted with runners which work in a groove. Tanks of water in the same room retain the pickled sheets until required for tinning.

The black sheets at present used are those which have been rolled at Messrs. Morewood's mills in Wales. They are black pickled, cold rolled and squared before being sent to this country. Consequently the only operations undertaken at the Elizabethport works are the second, or white, pickling, and coating.

Adjoining the pickling room on one side is the engine house, where a small oil engine is placed. It should be mentioned that oil fuel is used exclusively in the works. It is operated on the Aërated Fuel Company's system, and is found to be economical, effective and cleanly. The boiler is housed on the opposite side of the pickling room. A large chimney next to it carries off the vapors from the entire works.

THE TINHOUSE.

Opening from the pickling room is the tinhouse, an airy, light and well ventilated building, 100 feet long by 68 feet wide, holding eight of the Morewood tinning machines, now becoming familiarly known to American tinners, and, therefore, requiring no detailed description. Six six-roll pots, each having a daily capacity of 100 boxes, are devoted to the production of bright plates. The remaining two pots are of larger dimensions and capacity, and somewhat different in arrangement, being automatic in their action. These machines are used for coating terne plates and have combined a weekly capacity of 2000 boxes. Each pot holds about 15 tons of molten metal. The black sheets are fed into a flux box at one end of the machine, pass down into the metal pot and through a heavy pair of rolls fitted with finger guides, which push them up through a grease pot at the other end, when they are seized by a second and a third pair of rolls and pushed upward, almost all the grease being removed in passage. The plates, on emerging, require only a light rub over with a cloth.

Alongside each of the six bright tin pots is a Morewood cleaning machine, into which the coated plates are fed as soon as tinned. These remove the grease, and the tin plates are then transferred to a line of three Richmond patent dusting machines, placed in the center of the room, where they pass through rolls of india rubber and sheepskin, and are given the final polish. From the tinhouse the plates are taken to the assorting room D, where they undergo a scrupulously careful examination and sorting, all not found to be up to the standard being rejected and sold as "wasters." Stamping and boxing follow, and the finished goods are placed on trucks ready for shipment. No stock is retained at Elizabethport. Each day's product is immediately shipped, either by lighters to the company's selling agents at New York, or by water or rail to other points, in response to orders.

OTHER FEATURES.

A couple of large smelting pots are located in a separate building, having its own smokestack. Here the "scruff" collected from the pots is brought weekly and smelted, about 60 per cent. of pure tin being recovered from it.

The railroad siding, which enters the premises on the left, bifurcates inside the fence, one branch running toward the sea face as far as the end of the main buildings. The other track crosses between the shops and the outer buildings. This is used for the oil-tank cars, which discharge into pipes communicating with the storage tank, shown on the plan. The latter again communicates by means of feed pipes with the engine and boiler rooms and other parts of the works. Offices, stables, &c., as shown, make up the balance of the establishment.

The grades of tin and terne plates produced are identical with those made at Messrs. Morewoods' Welsh works. So far the product has been more or less confined to B. V. bright coke plates and P. T. L. ternes, but all the other brands of tin and terne made by the firm at Swansea and Llanelly can be made here. These include the well-known names Vivian Y. & B., Grange, Llannon (three crowns), Pentre, M. & J., Gloster and Park. The B. V. coke plates, of which 3000 boxes are now being turned out weekly at Elizabethport, are in great demand for canners' use. They are made of best Siemens steel and are highly finished.

All the tinning sets have been maintained in full operation ever since the first opening of the works in October last. Two hundred hands are employed, working in night and day shifts alternately, and we understand that it is all the company can do to keep abreast of their orders, although running to full capacity of the works.

J. A. Rogers, who is at present in Europe, is president of the Morewood Tin Plate Mfg. Company, and the works are under the immediate direction of the vice-president, H. Coulson Bond, who is assisted in the management by C. M. Stewart, both having had practical experience of the business at the home works in Wales.

SCRAP.

IMPORTS OF TIN and terne plates at San Francisco last year amounted to 374,426 boxes.

THE MELYN TIN PLATE WORKS, Neath, Wales, were partially destroyed by fire on June 10.

BELOW will be found the imports of tin and taggers metals at the port of New York, according to the latest returns:

	Week ending June 30, 1893.		Week ending June 24, 1893.		26 weeks of 1893.
	Quantity.	Value.	Quantity.	Value.	Quantity.
Tin, slabs	852,047	$185,186	649,957	$127,165	29,939,971 pounds.
Tin, boxes	64,293	205,725	43,512	147,040	1,103,824 boxes.
Taggers metal, boxes	4,895	16,785	4,210	13,452	

A VERY APPRECIABLE FALLING OFF is reported from Wales in the American demand for roofing ternes. Business in that line is stated to be unusually light this year.

JOHN BROMILOW, an Englishman of experience as superintendent of mills making black sheets for tin plate and of open-hearth steel plants, is stopping at the Commercial Hotel, Braddock, Pa., looking up this industry with a view of becoming interested.

F. R. SLAUSON, representing the interests of the Piqua, Ohio, tin-plate manufacturers, is now in charge of the World's Fair tin plate exhibit, which is daily visited by many interested inquirers, and if souvenirs were given out a small mill would be kept well occupied.

FOR THREE MONTHS ending March 31 the output of the Irondale Rolling Mill & Tin Plate Works, Wallace, Banfield & Co., Limited, at Irondale, Ohio, amounted to 2,088,221 pounds of black sheets. Of this product 1,121,381 pounds were tinned, 234,194 pounds were made into terne plate and 732,646 pounds were sold in the open market to other manufacturers of tin plates for tinning purposes. The plant of this firm is being operated to its utmost capacity, and they are entirely sold up on tin and terne plates and black sheets until September 1 next.

The late landslip in Norway extended for 7 miles, carrying away 40 farms and causing the death of 113 persons and many hundreds of cattle.

PLUMBING and GAS FITTING.

Examination of Plumbers.

From Y. M.—Is it necessary to go before the Board of Examining Plumbers and take out a diploma to carry on the plumbing business in New York, if I am not doing any work that requires a permit, such as opening streets or repairing water mains?

Answer.—The fifth section of the bill known as Chapter 620 of the laws of New York State, 1892, clearly states that "any plumber designing or intending to conduct the business of a plumber or of plumbing" must comply with the provisions requiring examination and license. The law does not, however, apply to a journeyman plumber who is hired by the owner or some one having an interest to do certain work. It is only when he undertakes to do a piece of work which he cannot complete without employing plumbers that the law comes into effect. The journeyman plumber doing such indoor work as our correspondent refers to must comply with the old and still existing rule of registering his name, &c., as journeyman, in the books of the Health Department, in order to be able to recover in court.

Sanitation *

BY JAMES H. O'NEILL.

a. Should Sanitation be Fostered by Legislation?

b. Should Legislation Precede Education?

c. The Extent of Municipal or State Authority in Sanitary Matters.

I do not propose to treat the subject of sanitation in an exhaustive manner; it will suffice to draw attention to a few prominent points and their sequences. To begin with:

SHOULD SANITATION BE FOSTERED BY LEGISLATION?

At this time of day it seems almost unnecessary to reply, but, for form's sake, let me give an object lesson. London, like many other Old World cities, at the beginning of the present century had a death rate exceeding its birth rate; hence its population was kept up only by fresh blood from the rural districts. Being a tidal city, the river Thames, on which it is situate, alternately, twice a day, filled its urban bed and left exposed to the rays of the sun a mass of black mud, hateful to the eye and offensive to the nose, which was the product of the city sewers of which the river was the terminus; hence the terrible death rate.

There are two theories of government: One—that of France, Russia and Switzerland—the paternal system, where the Government is understood to attend to everything; the other, of which, until recently, England was the best example, where the Governmental interference is limited and the "go-as-you-please" principle is asserted.

Public opinion on the tariff and labor questions in this country has divided the voters into bodies representing these ideals. But whatever divisions there may be on certain subjects, all are agreed that the province of legislation includes the preservation of life and property; also, that the State or nation, being, in its ultimate definition, a society for necessary co-operative purposes, is bound to act where individual effort would be impossible. So it was that London came to provide a colossal and flushable common sewer, constructed on ground taken from the river; its upper surface earth-covered and planted with flowers and shrubs forms a gay parade. The river, now clear and bright, no longer offends the eye and the nostrils and moves more quickly within its narrow banks. Best of all, the death rate was lowered to 18 per 1000 per annum—a reduction of about 50 per cent., if I remember rightly. The population of inner and outer London is now 6,000,000, but on a 3,000,000 basis the annual saving to humanity would be 54,000 lives per year, or 3,250,000 in 60 years.

Without legislation individual effort would be utterly powerless in this and all instances. No costly defensive armies ever produced such valuable results.

After a time, London found by gradual increase in the death rate that individual connections with the public sewer were often faulty. In London, Glasgow, Edinburgh and elsewhere voluntary Sanitary Mutual Protective Associations sprung up, which provided, among other things, for periodical investigation of all plumbing work on the part of the members. The results were insufficient and municipal legislation followed.

If the city sewers are as nearly perfect as possible, much still remains; leakage of house drainage poisoning the soil around, and subsequently the air, is the fruitful origin of multitudes of deaths from malaria, typhoid fever, diphtheria, &c., besides the cost to individual survivors, and hence to the community, of long sickness and absence from employment.

An instance of the pervasive nature of malaria comes from Switzerland. A village there, situated on a flat-topped foot hill, derived part of its water supply from a near-by pond into which the village drainage flowed. The pond received a small stream, but had no visible outlet. A malignant type of typhoid fever broke out, and the paternal Government authorities at once isolated the village by placing troops around. To their undisguised surprise typhoid fever soon after broke out in a village situated in a valley at the foot of the hill on which the first-named village was situated, and whose water supply was obtained for the most part from a stream bursting from the hillside, and which people suspected had subterraneous connections with the pond above referred to. To test the matter the Government experts nearly emptied the pond, cleaned out its mud, then poured into it large quantities of the finest flour. The closest microscopic investigations of the hillside stream showed no sign of the flour or its discoloration. In a second experiment they poured large quantities of salt into the pond. Now the hillside stream becomes a saline one. It was now clearly evident that typhoid fever could pass through a clay filter which afforded no passage for the finest particles of flour. This is a simple but complete object lesson of the perils of infiltration.

Unfortunately we have, within our own country and our own knowledge, in the multitudes of deaths from typhoid fever or drain fever, malaria and diphtheria, sad lessons enough. I remember a young physician, prospering in his profession, who moved to a larger and finer house in rather a low-lying district. He had three fine children; after his removal they died, one by one, in rapid succession; not until the last dread messenger had called did he discover there was an ill-trapped sewer on the premises.

Plainly, legislation is necessary: 1, To prevent the sacrifice of human life; 2, to prevent the financial losses consequent upon long-continued sickness and deaths; 3, to preserve us from quacks and incapable persons.

SHOULD LEGISLATION PRECEDE EDUCATION?

I think it must—we cannot all be generals or soldiers, it requires military training; we cannot all be M.D.'s—that would require education at Ann Arbor, Bellevue or other university; we cannot all be military, civil, or sanitary engineers, neither can we all be skilled plumbers. Legislation should, recognizing popular ignorance, give in all its preambles a brief statement of the salient points we have noted, and as the State calls to its aid in times of war and epidemics the soldier and the doctor, and in times of panic the financier, so the law makers should co-operate with the sanitarian, and the recognized master plumber with the experts, so to say, in framing proper laws and regulations on these matters, including the careful examination of candidates for licenses as master plumbers.

THE EXTENT OF STATE OR MUNICIPAL AUTHORITY IN SANITARY MATTERS.

As to this proposition I should say the authority of the State is that of the people of the State, and has no limit except where United States forts, or the like, may be within its bounds, and sometimes not even then. Another limit is where power has been delegated to the municipality, which, also, is supreme within the range of its power so acquired. The National Association of Master Plumbers should be, and is, able to present to all governments—State and municipal—a full scheme or outline of the necessary elements of all sanitary legislation, and the incidental rules and regulations consequent thereupon.

It is only thus, by a co-operation of power and skill of the intelligent legislator and the skilled master plumber—that the health and welfare of the whole population can be conserved.

The undersigned respectfully suggests to the National Association the propriety of preparing forms of necessary legislation, State and municipal, suited to all parts of the country, which might be made the work of a well-selected special committee.

* Paper presented at the Milwaukee Convention of the National Association of Master Plumbers, June 13-16, 1893.

TRAPS AND VENTS.

B. F. McFarland, Indianapolis, Ind., manufacturer of the American bathtub system, finds a growing demand for his goods. A galvanized tank is located convenient to a heavy zinc bathtub, and a pump is connected with them to draw water from a well or cistern to the tank, where a gas burner heats the water. By opening a cock in the bottom of the tank the tub is supplied. In the country and among farm houses it has found much favor, as gasoline can be used where there is no gas supply.

The Milwaukee Brass Company of Milwaukee, Wis., are getting up patterns and tools for the manufacture of the Fuller system of faucets, &c.

Samuel S. Hibbs is untiring in his search for customers for bath boilers, tanks, stacks and heavy sheet-iron work for the house of E. A. Hibbs at Philadelphia. At present the shop is running at full blast.

The Supervising and Examining Board of Plumbers of Troy, N. Y., have chosen William Ferguson as president and Joseph C. Ryan as clerk.

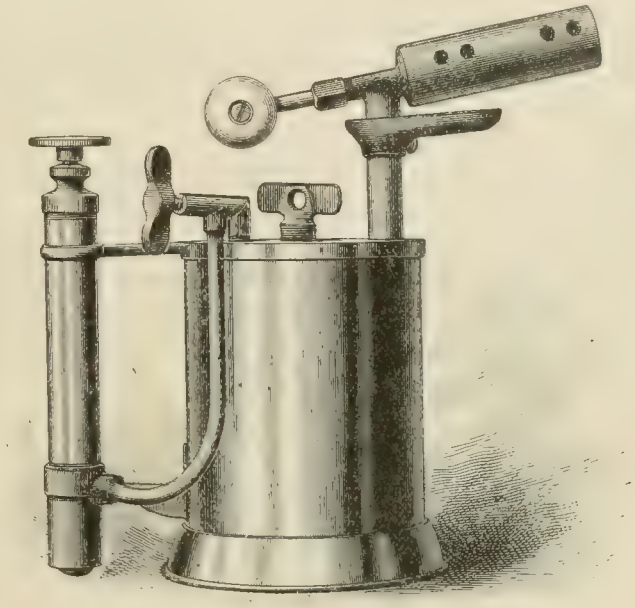
The New Jersey Lamp & Bronze Works, New Brunswick, N. J., have published a very elaborate catalogue of electric and gas fixtures, which they are sending to the plumbing and house furnishing trades on request by letter. The publication is artistically bound in chocolate-colored covers with gilt design on the front. It is oblong in shape, measures 6 x 9½ inches, and the leaves are fastened at the top by a blue silk cord. The printing is entirely on one side of the page, and is done in differently tinted inks, with very pleasing effect. The first few pages of the catalogue give particulars concerning styles of fixtures and drawings, mentioning the kind of metal work the firm make to order, then continues with information concerning colors and finishes, glassware, extra lengthening, shipment of goods and a statement of the particulars requested in ordering goods. Accompanying the different illustrations are their catalogue numbers, together with names, code words, size and other important information. The pages have a very pleasing effect, for the text is brief, and the cuts in colored ink show on the fine paper with beautiful effect, some of the earlier bronze figures being especially attractive. At the close of the pamphlet reference is made to miscellaneous electrical supplies. Altogether the volume is gotten up in a very handsome fashion, and will no doubt be much appreciated by the trade. It is worthy of note that this elaborate work was published by the private printing department of the New Jersey Lamp & Bronze Works.

Henry R. Worthington are distributing serviceable little souvenirs respecting their exhibit at the World's Fair. One of the pamphlets is a map giving a plan of the World's Fair, the location of the Worthington exhibits being noted, while the accompanying text indicates what they are. On the back of the sheet is a plan of Chicago and the World's Fair, showing the means of communication and the location of the different prominent buildings, including the branch office of Henry R. Worthington. Another pamphlet gives a description of the Worthington pumps, together with a smaller map of the fair grounds.

The cultivation of flax in the United States is recommended as a promising industry by our commercial agent at Dunfermline, Scotland.

Empire Blow Pipe and Paint Burner.

Tinners' Machinery & Supply Company, 9 Cliff street, New York, are introducing an improved blow pipe and paint burner, as here shown, which will be known as the Empire. It has a heavy rolled brass cylinder 5 x 4 inches, capable of withstanding high pressure. A pump is placed in the handle and air is introduced into the reservoir by means of a curved pipe to which a valve operated by a thumb screw is attached. In the top is a cast-iron plug to close the opening through which gasoline is poured into the cylinder. The tank should never contain more than two-thirds or three-quarters of its capacity.

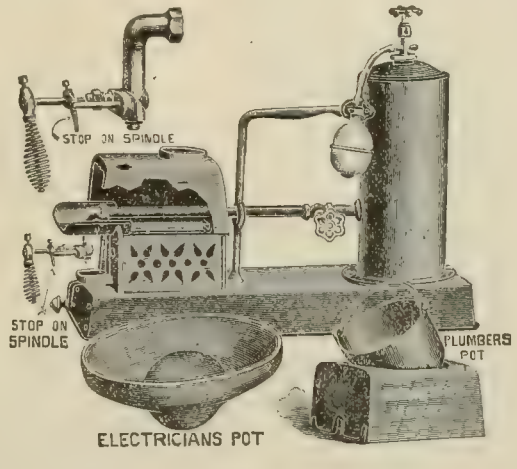


Empire Blow Pipe and Paint Burner.

Fastened by a set screw to the standard of the burner is a cast-iron drip cup. During the process of charging the needle screw in the burner should be made tight to permit the accumulation of air. When in use the needle screw is opened enough to allow gasoline to drip into the cup until full, when it is closed again and the oil lighted. This cup holds a sufficient quantity of oil to vaporize the gasoline, so that when the needle screw is opened a flame is produced, the intensity of which can be regulated. All the parts are interchangeable.

Improved Burgess Soldering Furnace.

The accompanying illustration shows the appearance of an improved form of Gem No. 3 furnace, made by the Burgess Soldering Furnace Company, Columbus, Ohio. The improvement is in the regulating valves of the furnace and is applied to all the Gem furnaces Nos. 3, 4, 5, and 6. The feature of the improvement is the stop on the spindle, its object being to prevent the operator from turning the Alaska handle two or three turns. Heretofore the old valves had no stop of this sort and by turning the handle two or three times the threads on the needle rod would destroy the asbestos packing in the stuffing nut and cause it to leak. With the stop on the spindle the operator can only turn the handle one-half revolution, which will allow a full flow of gas and prevent the threads of the needle rod from destroying the packing and thus avoid leakages. The stop is adjustable, and we understand that those who handle the furnaces say it is a very decided improvement, as it simplifies the operation so that inexperienced persons can run it easily.



Improved Burgess Soldering Furnace.

Electric traction is likely to get a foothold in the streets of San Francisco.

THE TIN SHOP.

Pattern for Ship's Ventilator.

From W. S. W., *Michigan City, Ind.* —Inclosed find the elevation, section and pattern of a ship's ventilator. I tried to obtain the pattern by working it the same as Fig. 367 in *The Metal Worker* Pattern Book, but it will not come out right. The sections will not fit together. I would like to be informed where I made my mistake.

Answer.—Figs. 366 and 367 in *The Metal Worker* Pattern Book refer to a conical flange to fit around a pipe and against a roof of one inclination. In this example the part of cone through which the pipe is to pass is cut at right angles to its axis. The part of cone that is to fit against the roof is cut oblique to its axis, and the shape produced by this cut is an ellipse, as shown in plan, Fig. 366.

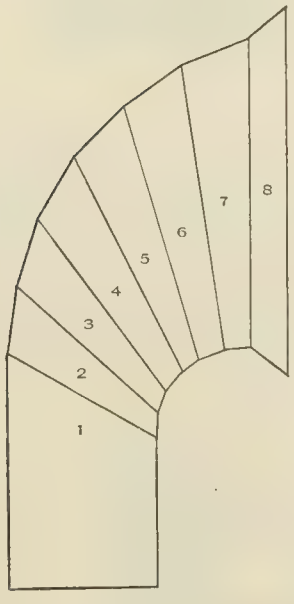


Fig. 1.—Elevation of Article for which Patterns are Required.

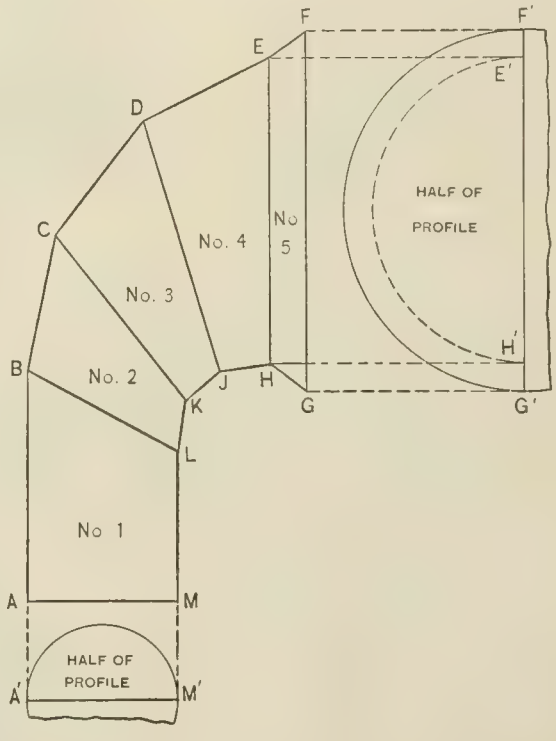


Fig. 2.—Elevation of Article Used in Following Illustrations.

PATTERN FOR SHIP'S VENTILATOR.

In Fig. 1 is shown the elevation of article for which the patterns are desired. For convenience of illustration the elevation of article has been changed, as shown in Fig. 2. In this figure, A B L M is supposed to represent a cylinder cut by the line B L. The shape produced by cutting a cylinder oblique to its axis is an ellipse. Section Nos. 2, 3, 4 and 5 are supposed to be obtained from cones, as indicated by the method used by the correspondent, shown in Fig. 4. Three of these cones are shown in Fig. 3. Section No. 5*a*, as indicated by E*a* F*a* G*a* H*a*, is the frustum of a cone of which R*a* is the apex. Section No. 4*a*, indicated by D*a* E*a* H*a* J*a*, is a section of the cone E*a* N*a* Q*a*.

The cut E*a* H*a*, being oblique to the axis of the cone, will be an ellipse, while the cut D*a* J*a*, being at right angles to the axis, will be a circle. Section No. 3*a* is derived from the cone D*a* O*a* P*a*. The cuts D*a* J*a* and C*a* K*a* are each oblique to the axis of the cone D*a* O*a* P*a*, consequently each cut will be an ellipse. The same can be said of No. 2*a*. Want of space prevents the showing of this cone. We can now see why the various sections will not fit together, as the cut D*a* J*a* of No. 3*a* is an ellipse, while the cut D*a* J*a* of No. 4*a* is a circle. Also, the cut E*a* H*a* of No. 4*a* is an ellipse, while the cut E*a* H*a* of No. 5*a* is a circle.

The method pursued by our correspondent for obtaining the pattern of section No. 4*a* is shown in Fig. 4. In this figure E*b* N*b* Q*b* represents the cone, which is cut as indicated by the lines E*b* H*b* and D*b* J*b*. The method employed by our correspondent in cutting the pattern of the frustum is that commonly used in similar problems in *The Metal Worker* Pattern Book, and in itself considered is correct. The error of the correspondent probably arises through the assumption that sections of different cones cut by oblique lines will fit together. In this connection it should be borne in mind that each segment must be developed from the section of the cone immediately preceding and with which it connects.

In Fig. 5, let E*d* N*d* J*d* D*d* represent the frustum of a cone of which E*d* H*d* J*d* D*d* is a section. To obtain the length of the minor axis of ellipse formed by the cutting plane E*d* H*d* proceed as follows: Bisect E*d* H*d* in *x*, and through *x* draw *y z* parallel to the base E*d* N*d*. As *p o* is the axis, from *i* as center, and with *y i* as radius, describe the semicircle *y w z*. From the point *x* and parallel with *o p* draw *x w*, extending it until it cuts the semicircle *y w z*. Then *x w* is the semi minor axis of the ellipse. In the ellipse below, *u v* is equal to E*d* H*d*; *p t* and *p s* are equal to *x w*. The ellipse *u t v s* can be described in any convenient manner, and is the shape produced by cutting

the frustum of the cone E*d* N*d* J*d* D*d* by the line of cutting plane E*d* H*d*. Referring to Fig. 3, the shape produced by cutting the cone E*a* N*a* Q*a* by the oblique plane E*a* H*a* is shown in Fig. 5 by the ellipse *u t v s*. Also, the shape produced by cutting the cone F*a* G*a* R*a* in Fig. 3 by the plane E*a* H*a* is shown in Fig. 5 by the circle *u r v q*. It must be evident that the sections 4*a* and 5*a* in Fig. 3 could not be put together without bending one or the other out of shape.

In Fig. 6 the shape produced by the cutting plane D*e* J*e* is shown by *l o m n*.

In Fig. 7 the various shapes are contrasted. The section No. 4*f* is the same as No. 4*a* in Fig. 3. The half shape of cut on line E*f* H*f* is indicated by E*f t* H*f*. The shape it is supposed to join on section 5*a* is indicated by E*f r* H*f*. Also, the shape of cut indicated by D*f* J*f* is shown by D*f k* J*f*. The shape of cut produced by the line D*a* J*a* for the section No. 3*a*, in Fig. 3, is indicated by D*f n* J*f*. That sections of various cones will not go together as desired must be evident from an inspection of the previous engravings.

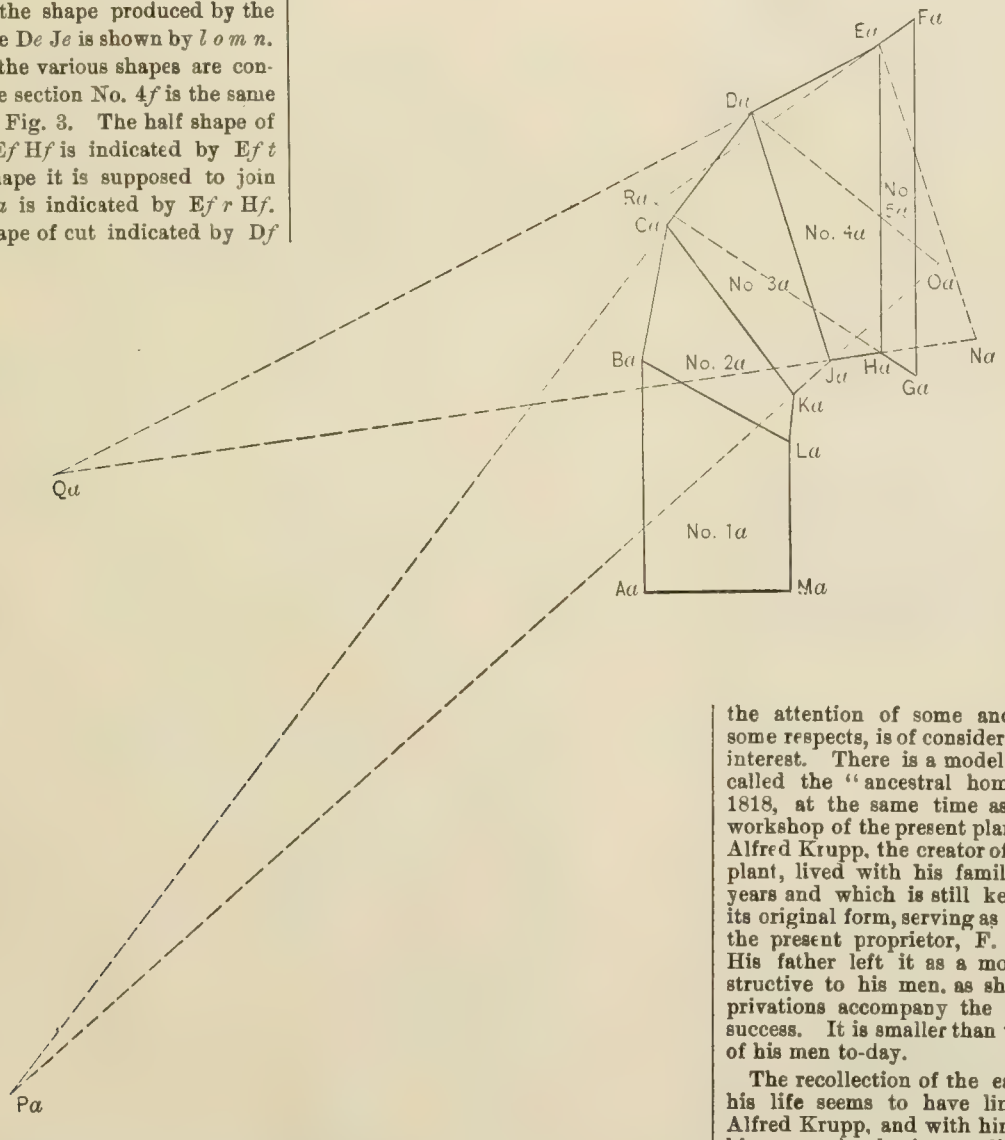


Fig. 3.—Three Cones from which Sections are Derived.

PATTERN FOR SHIP'S VENTILATOR.

Referring to Fig, 2, section No. 1 is a cylinder, as indicated by the half profile A′ M′, which is cut by the plane B L. The shape of this cut would be an ellipse whose major axis would be equal to B L, and the minor axis to A M, the diameter of the cylinder. As the shape of section No. 5 on lines E H and G F, as indicated by the half profiles F′ G′ and E′ H′, is a circle, the part of section No. 4 where it joins No. 5 should also be a circle. We can then consider that the line E H is to represent a circle, and also that the line B L represents an ellipse. Thus the shape on two of the miter lines is established. To obtain the patterns for sections Nos. 2, 3 and 4, the shapes on miter lines C K and D J can be modified as desired so as to conform to the two established shapes. It must be evident that the mistake made by our correspondent was in assuming that sections of various cones, cut by oblique lines would go together as indicated by the elevation.

George Wheeler, for upward of 40 years connected with the hardware trade in New York, died June 19 at his home in Brooklyn, aged 61 years. He was born in England and came to this country when a lad with his parents. At different times he was connected with the Peck Smith Mfg. Company, now known as the Peck, Stow & Wilcox Company, Landers, Frary & Clark, Scovill Mfg. Company, and for the last ten years represented John Chatillon & Sons on the road, being in their employ at the time of his decease.

Krupp and His Workmen.

The great majority of Americans have learned to couple the name of Krupp with the manufacture of great guns, while a few know of and appreciate the achievements of the firm in the production of various forms of merchant steel plates and track material. The exhibit at the fair will open the eyes of many to the high character and magnitude of the work done. Yet there is one part of the exhibit which has not escaped the attention of some and which, in some respects, is of considerable general interest. There is a model of what is called the "ancestral home," built in 1818, at the same time as the oldest workshop of the present plant, in which Alfred Krupp, the creator of the present plant, lived with his family for many years and which is still kept intact in its original form, serving as the office of the present proprietor, F. A. Krupp. His father left it as a monument instructive to his men, as showing what privations accompany the struggle for success. It is smaller than the quarters of his men to-day.

The recollection of the early days of his life seems to have lingered with Alfred Krupp, and with him and with his son a wise business policy has stimulated efforts to make the surroundings of their men as satisfactory as possible. There is an assumption of parental authority in a good many of them, which would probably defeat its good objects in this country by arousing, possibly, unreasonable opposition, in the face of the fact that it is coupled often with princely generosity. But, withal, the arrangements rest on a strictly business-like foundation, and are not tainted by any sickly sentimentality, nor is there about them any flavor of lordly patronage productive of constant irritation and disgust. We are indebted to A. Lauter, one of the representatives of the firm, for volumes which describe in detail the arrangements for the welfare of the firm, which are in charge of a special branch of the administration.

Founded in 1810, it was really not until the forties that the undertaking was of any consequence whatever. In 1832 ten workmen were employed. In

1843 the number of men employed by Krupp who were residents of Essen had risen to 99, and only went beyond 1000 in 1858 and 2000 in 1861, the population of the whole town being 20,766. In 1871 the town had a population of 51,840, of whom 8810 were Krupp workmen, the whole number of dwellings being 3322. While in 1840 an average of only 7.53 persons occupied a house, there were 15.5 souls under one roof on an average in 1891. The construction of company houses had begun at Alt-Westend in 1863, but it was not until 1871 that the problem became a matter for serious consideration. The rapid development of the plant had attracted a large working population with which local building activity had not kept pace. Uncomfortable quarters drove the men to groggeries and beer houses, which increased in number amazingly. The fact that the population has been drawn from very different sources led to frequent trouble, and demagogues began their work of creating unrest.

Heroic measures were called for, and in the years 1871 to 1873 not less than 2358 family dwellings were built. A number of considerations, probably valid at that time, but hardly so now, put the introduction of the cottage plan out of the question. Real estate was high, and it was deemed necessary that the men should not be living at too great a walking distance from the works. Then the scattering of the homes over too large an area would make the water supply too expensive. A number of colonies were established, each of them having its schools, churches, company stores, markets and parks. The following statement shows the number of houses and the number of dwellings, or suites of rooms, which they contain:

	Houses.	Suites of rooms
Alt-Westend, 1863	8	144
New Westend, 1871	18	108
Nordhof, 1871	..	162
Baumhof, 1871	41	154
Schederhof, 1872	82	492
Schederhof Barracks, 1872	70	280
Cronenberg, 1872-74	221	1,356

The last named may be taken as typical of the arrangements. The colony contains the following:

97 houses, each 6 suites of 2 rooms.
31 houses, each six suites, three of 2 rooms and 3 of 4 rooms.
80 houses, each 6 suites of 3 rooms.
2 houses, each 3 suites of 5 rooms.
2 houses, each 6 suites of 3 rooms.
3 houses, each 6 suites of 4 rooms.
6 double houses, 18 suites of 2 rooms each.
6 double houses, 36 suites of 3 rooms.
6 double houses, 18 suites of 4 rooms.

The company houses are rented only to employees, preference being given to those having long service with the firm. Boarders are allowed only when it is deemed advisable, the total number being only 256. The annual rental is $15 to $22.50 for two-room suites in the barracks, $22.50 to $27.50 in other two-room dwellings, $30 to $40.50 in three-room, $45 to $50 in four-room and $52.50 to $82.50 per annum in five-room suites, deducted semi-monthly from wages.

On July 1, 1892, the firm had 25,200 employees, whose families of 62,700 carried the total population up to 87,900. Of these there lived in their own houses 15,300; in houses owned by Krupp, 25,800; and in outside houses, 46,800.

The outlay for 3659 suites of rooms at the Essen plant, and the income, were as follows:

	Marks.	Marks.
Cost of houses	11,042,451	
Real estate	1,213,624	
Total cost	12,256,075	
Income:		
Rents		484,675
Deduct repairs	112,678	
Deduct gas, water, repairs, &c.	67,650	
Deduct taxes and insurance	48,000	
Expenses		228,328
Balance		256,347

On a capital outlay of roughly $3,000,000 was realized $62,575, or about 2.1 per cent., which is a low rate of interest even for the Continent. The figures are a little better for the 523 suites of rooms at outside works and mines. The cost was 1,742,335 marks, which yielded a gross rental of 67,045 marks, and a net revenue of 44,955 marks, or 2.58 per cent. on the investment.

In 1889 F. A. Krupp went a step further and set aside the sum of 500,000 marks as a loan fund, from which workmen or employees may borrow at 3 per cent. interest to build their own homes. The yearly income of the applicant must be less than 3000 marks, he must show three years' irreproachable service, must have served his time in the army, and must make a first payment of at least 300 marks out of his own means. The money borrowed must be repaid in semi-monthly installments so that the mortgage is extinguished in 25 years. The loan may be called at once if the property is transferred to another party, or if the borrower has been dismissed or leaves the employ of the firm voluntarily within the first ten years. Thus far 75 houses ranging in value from 1000 to 13,000 marks have been built under this arrangement.

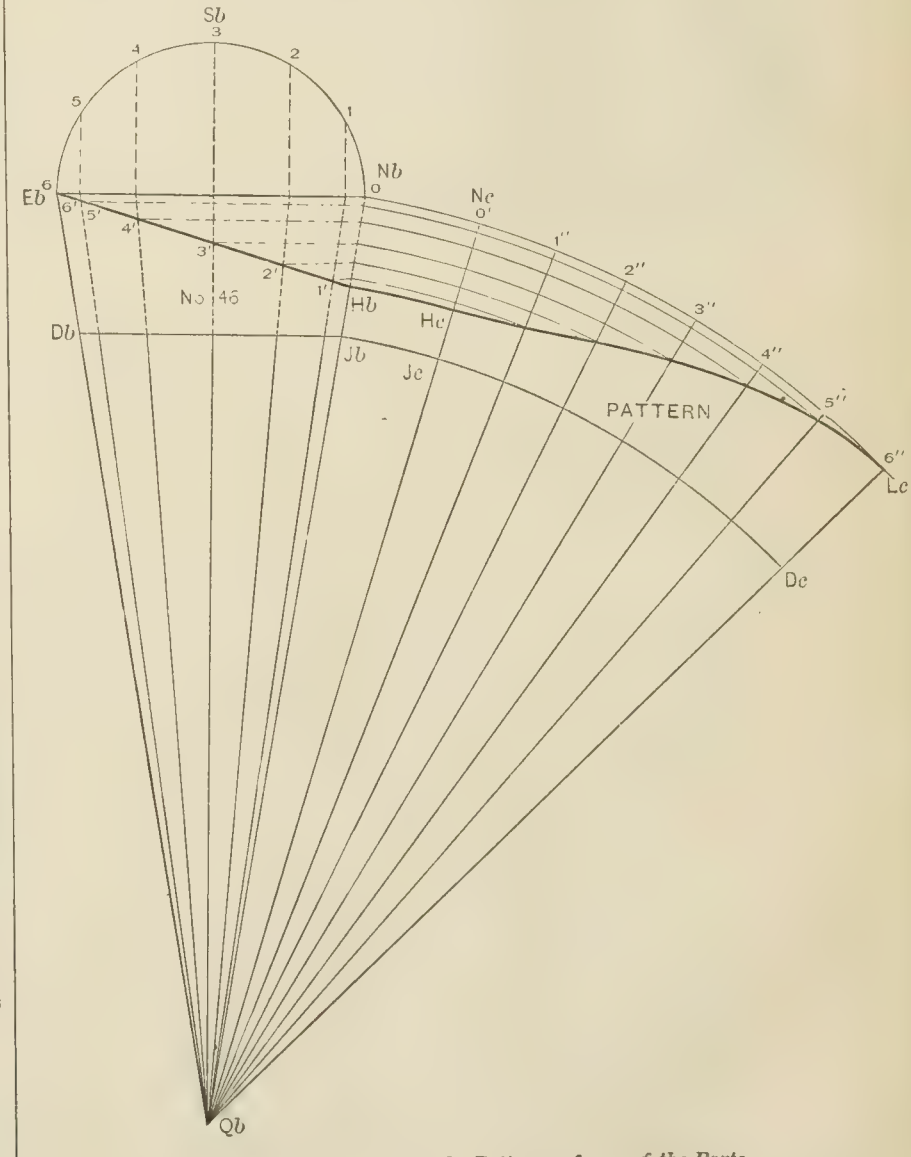


Fig. 4.—Method of Obtaining the Pattern of one of the Parts.

PATTERN FOR SHIP'S VENTILATOR.

As early as 1856 Krupp arranged for a common mess and barracks for unmarried men, and in 1884 made living at them obligatory upon all who are not skilled workmen, or who cannot show that they live with near relatives. The last barracks built at Freistadt was for the accommodation of 1200 men, but one of the wings has been altered for families because a large proportion of the unmarried men are sons of old workmen and live with their parents. The board costs 15 cents a day for persons under 16 years and 19.5 cents a day for older persons, exclusive of bread. The volume in question reports in detail the quantities and cost of food

served for 100 persons, for the midday meal and supper, and thus constitutes an interesting budget. The statement is made that the firm loses money at the rates given unless the barracks are pretty full.

Company Stores.

A co-operative company which had got into trouble in 1868 was taken over by the firm. The main objects of the system are to place cheap and good articles at the service of the employees, and to watch, above all, that no adulterated goods are offered for sale. A strictly cash business is done, in order to encourage economy and keep the men from contracting the habit of borrowing. Since the beginning of 1890 the firm has arranged to return all profits on the store business to the purchasers. A pass-book is issued to every purchaser, in which all cash sales are entered. Before Christmas the profit is distributed pro rata After the first year's operations a profit of 5 per cent. on total sales was paid in cash to buyers. During the fiscal year 1890-91, 8641 employees of the Essen works and 2513 employed at outside establishments participated in this profit.

There are 15 stores in which groceries are sold and 9 for dry goods. Besides, there are shoemakers' shops, a mill and bakery, slaughter house and seven restaurants. Some idea of the magnitude of the business may be obtained from the following list of aggregate sales in 1890:

	Kg.
Wheat flour	934,094
Buckwheat flour	54,800
Beans	91,253
Pease	110,432
Lentils	17,873
Rice	111,861
Lard	112,995
Butter	111,771
Coffee	207,100
Prunes	69,680
Potatoes	963,214

The bakery produced 1,184,886 kg. of black bread, 584,108 kg. of rye bread, 233,523 kg. of wheat bread, 2,505,676 rolls and 1,117,245 "zwieback." During the same year the slaughter house sold 1335 beeves, 1343 calves, 4907 hogs, and 817 sheep. The sales of beer aggregated 1,424,539 liters, while the sales of wine amounted to 167,000 bottles.

Full tabular statements are given concerning the average prices at which the leading articles were sold from 1871 to 1890. As an example, the figures dealing with the latter year may be presented:

	Per 100 pounds. Cents.
Potatoes	65.85
	Per pound.
Black bread	1.59
Beef, first quality	15.06
Beef, second quality	13.96
Veal, first quality	14.55
Veal, second quality	13.45
Mutton, first quality	15.12
Mutton, second quality	13.20
Pork	16.41
Lard	11.00
Butter, first quality	26.14
Wheat flour	3 30
White beans	2.78
Pease	2.99
Lentils	5.17
Rice	3.39
Java coffee	27.32
Salt	2.18
Prunes	5.75
Cube sugar	11 00

Since 1882 an ice factory has been in operation. During the period of May to October a 30-pound block is delivered daily for $7 per season.

Most elaborate arrangements have been made by Krupp to provide for the proper sanitary condition of his men. There is a large hospital. The sick fund, a separate organization, pays 37 cents per day for the support of men, and lower rates for women and children, the firm paying the deficit. During the year 1890-91, with 15,918 persons employed, there were 1192 men and 575 women and children as patients, who remained in the hospital on an average 19.73 days, the hospital cost per workman being $1.86. Provisions have also been made for hospitals for epidemic diseases.

Sick Funds, &c.

A sick and death fund was established as early as 1853. The passage of the law of June 15, 1883, made a reorganization necessary, and two distinct associations were created, one for the support of the sick and one for pensioning the old and disabled. The sick fund is administered even more liberally than the provisions of the famous German law called for. In 1890, with 15,572 members, the dues were 275,496.44 marks. The firm contributed their legal third, or 137,682.91 marks, and 13,374 21 marks were received from outside patients. The outlays included 50,777.18 marks for medical attendance, 63 658.38 marks for drugs, 172,503 31 marks for sick money to members, and 32,851.63 marks to their families. The sums paid to hospitals were 31,994 35 marks; 15,006 marks were laid out for funerals, and 60,000 marks were carried to surplus fund, bringing the total up to 435,435 marks.

Some of the figures submitted by Krupp concerning the pension fund are interesting. The demands upon it under the new law seem to be growing very rapidly. In 1885 110 men drew 46,052 52 marks, 126 widows were paid

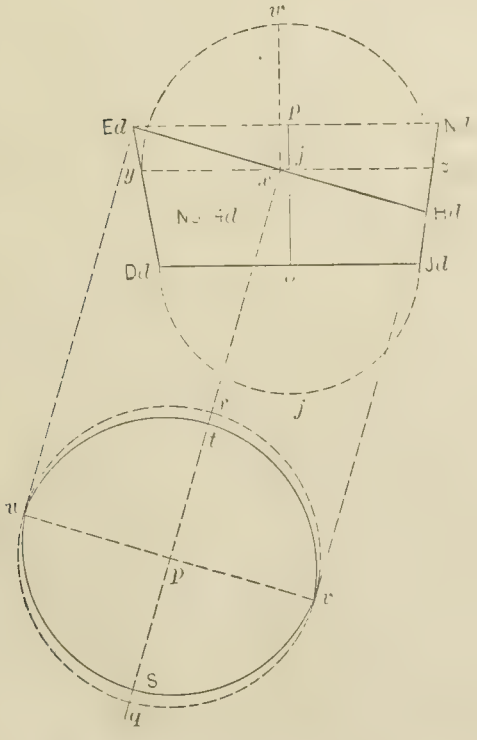


Fig. 5.—Shape on Miter Line Ed Hd.

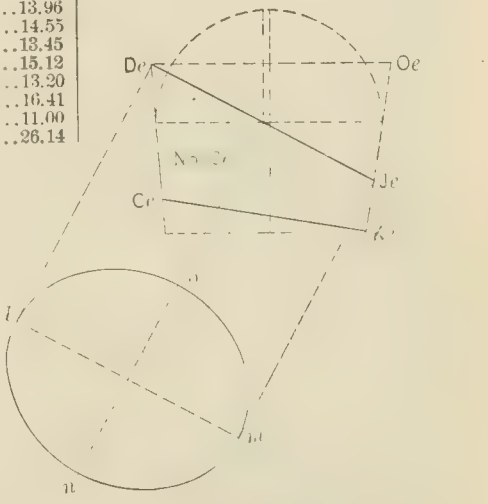


Fig. 6.—Shape on Miter Line De Je.

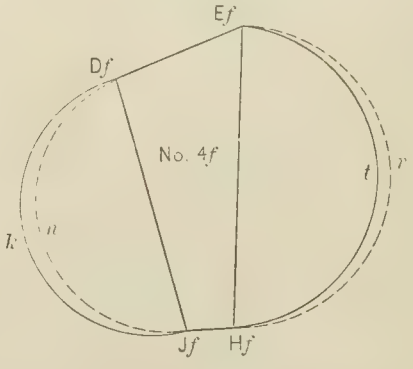


Fig. 7.—The Two Shapes Contrasted.

PATTERN FOR SHIP'S VENTILATOR.

33,655.19 and four orphans 189 92 marks, a total of 79,887.63 marks. In 1890 312 men received 144,053.62 marks, 357 widows drew 93,133 96 marks, 35 orphans 1,687.19 marks, while 15 men drew 1936 marks in partial pensions, carrying the total up to 240,810.77 marks, or roughly $59,000. No idea can yet be formulated concerning the average duration of the pension. Recently three Krupp pensioners have died who had lived 18, 20 and 13 years respectively after being retired from active work.

Lately additional acts have increased the scope and the payments under the pensioning act, and Krupp has accordingly voluntarily increased his annual contribution to the fund from the legal third to one-half, which will carry it to about $60,000 a year. In 1890 the present fund possessed in securities and cash 2,208,851.18 marks. The membership dues were 211,122.47 marks, and the Krupp contribution was 105,561.30 marks. Initiation fees amounted to 21,219.28 marks and interest to 91,196.18 marks. Other sources of income brought the total 440,233.53 marks. The expenditures, including 240,810.77 pension payments, footed up to 249,160.57 marks, leaving a balance to carry to surplus of 191,072.96 marks.

In 1890 E. A. Krupp contributed 500,000 marks to a pension fund for officers of the firm, and provisions have also been made for accident insurance for officers and the better paid employees

In 1887 he subscribed 1,000,000 marks as a fund the income of which is to be used for aid to those employees of the works who have suffered misfortune and whose case is not reached under the present laws.

A sum of 500,000 marks has been donated as a fund for the benefit of the citizens of Essen. The capital will probably be invested in workmen's houses.

In 1877 a life insurance scheme was started and which is prospering.

Comprehensive work has also been done in establishing common schools, which now have an attendance of 1100 scholars, in promoting industrial schools for grown girls, and for teaching household duties to girls. An apprentice system for boys has been long a feature of the works, the principal object being to train good carpenters and masons. Scholarships to the amount of 12,000 marks annually are granted, for aid in attendance at technical colleges. A club house has been built for the officers of the company, who pay low initiation fees and annual dues. Water and gas are furnished to residents of the Krupp houses at cost, the figures being extremely low.

Sealed proposals will be received at the office of the Supervising Architect, Washington, D. C., until July 26, for all the labor and materials required for the interior finish, including plumbing, &c., of the United States Court House, Custom House, &c., Building at Duluth, Minn., in accordance with the drawings and specifications, copies of which may be had at the office of the Supervising Architect at Washington, or from the superintendent at Duluth, Minn.

Co-operative farming is greatly in vogue in Denmark. Over 1000 farms are conducted on this principle and are said to be very flourishing.

The Sale of Athletic and Sporting Goods.

BY T. W. STAKE.

THESE GOODS cannot usually be satisfactorily added to a general Hardware stock, unless a special department with a competent manager be started. The line has grown so large and varied, being almost as complicated as a general Hardware stock, that it requires an experienced person to talk intelligently on each subject, such as Guns, Bicycles, Fishing Tackle, Lawn Tennis, Foot Ball, Gymnasium Goods, Base Ball Goods and Athletic Clothing, &c. A salesman in this line particularly must gain the confidence of the sportsman; he can then sell him the goods he recommends, and can take orders for goods he does not carry in stock. Fortunately, the different lines are seasonable at different times in the year, so that the stock can be changed to suit the season; each particular line can be reduced, so that at the end of the year a very small stock is carried over.

THE SEASONS

Are as follows: For spring, Bicycles, Fishing Tackle; for summer, Base Ball, Lawn Tennis, and Fishing Tackle; for fall, Guns, Foot Ball; for winter, Gymnasium Goods, and, I might add, Skates. Revolvers sell in a small way all the year round.

The kind of goods usually sold in Hardware houses with Sporting Goods departments, or exclusive Sporting Goods houses, in my experience as a traveler for ten years and manager of a Sporting Goods department for five years, the size of the stock carried being graded by the size of the town and its locality, is as follows:

Guns.—A few Single Barrel Breech Loaders; a fair line of imported Guns, to sell from $10 to $25; a fair line of American-made Guns, to sell from $25 to $75, and a very small sample line of high-grade imported Guns, from $100 to $250.

Fishing Tackle.—Medium and high grade goods that suit the section of the country. Toy and stationery stores usually sell the common goods.

Bicycles.—Get an agency for a high-grade Wheel, and carry a sample line from $20 to $100. This with a line of sundries is all that is necessary.

Lawn Tennis.—A fair stock of good quality Rackets, with very few common goods; also a good supply of best Balls, with samples of Nets, Markers, &c.

Base Ball.—A complete line of Balls and Bats, but principally good-quality goods; also Mitts and Gloves, as well as Masks, &c.; also sample material for Base-Ball Suitings.

Foot Ball.—A small line of American Rubber Foot Balls, with a better line of Leather Rugby-shape Balls, and a few Association Leather Balls; also samples of Foot-Ball Clothing to take orders from, as this amusement is increasing in popularity.

Gymnasium Goods.—A complete line of Indian Clubs, Dumb Bells, together with a small line of Chest Weights. Have a catalogue of some large maker of Gymnasium Apparatus.

Revolvers.—A complete line, although better goods sell the best.

Skates.—A complete line where the climate permits of skating.

The sale of the goods can be increased by the clerks or partners joining or taking an interest in the clubs in town, thus making the acquaintance and gaining the confidence of the members. It is policy to keep the stock in season in full view—at the front of the store if possible—so that everybody coming in to buy Hardware can see this line easily.

The stock should be kept clean and fresh, especially Bicycles, Guns, Revolvers, Tennis Rackets and Fishing Tackle. Clerks in this department should always dress neatly and keep the store clean. It is good policy for salesmen to show Sporting Goods to customers, even though they are buying other lines.

SHOW WINDOWS.

Goods should be delivered promptly and when taking special orders never promise goods before the time you can deliver them. The display in show windows should be given special attention and changed often, always showing seasonable goods only, and making the windows attractive by adding special features from time to time—such as pictures of crack Bicycle riders, base-ball clubs, prominent foot-ball or tennis players and in the fall mounted animals or any novelty which would attract people. I believe a good percentage of the most profitable business comes from the show windows.

All of the suggestions I mention can be carried out on a small or large scale according to the size of the town. While it may seem that I have mentioned a great many different articles connected with Sporting Goods, still their coming in at different seasons makes the investment rather small at any one time.

THE CATALOGUE ALONE.

I believe in this age of sharp competition it would be difficult to do much business with the catalogue alone, as no person more than a sportsman likes to handle the goods he wants to buy. Still, in very small towns where there is no competition samples of some goods could be carried and orders taken from catalogues for others, but the business must necessarily be small.

Stocks of wheat in the United States last week were returned as 66,376,000 bushels, against 26,006,000 bushels year in the corresponding week of last held.

STOVE TRADE NOTES.

World's Fair Exhibits.

Cooking and Heating Apparatus.

THE MAGEE FURNACE COMPANY

of Boston have an exceptionally fine exhibit at the World's Fair. They not only erected a pretty pavilion, but introduced some clever features with it that are very effective. The floor, for instance, is tiled in two colors in two levels. Red unglazed tile is used for the center, which is in the form of a circle, so large in its sweep that the space left around it is just wide enough for a stove platform. The platform is tiled in cream glaze, with an oak border Potted plants are tastefully arranged among the stoves. The pavilion is built of antique oak posts, with a muslin canopy gracefully caught up in the center, from which also hangs a fine electrolier, while heavy ornamental rope is festooned from post to post for a railing. The goods shown are gotten up very attractively. The new Magee Grand range is placed on a tiled platform in the center of the pavilion as the leader. It is a magnificent piece of work from the standpoint of artistic molding. The motive of the molding is leaf work, the high surface being beautifully nickeled, making a sharp contrast with the quiet black background. This range has some peculiar features apart from its beauty. There is a plate on the end of the fire box, fastened by pins, which when removed enables the grate to be drawn out for repairs without disturbing the linings.

The Dockash grate is used. The oven door is ventilated, as has always been the practice of this company, but a new device is a thermometer on the oven door. It is a circular metal thermometer, set in the place of the usual tile. It is useful to show the temperature of the oven, but at the same time adds to the decorative appearance. The water front for this range has a tube projecting from the center horizontally into the fire box, which greatly increases the water-heating power without detracting from the efficiency of the fire. All the other modern improvements and conveniences have been incorporated in getting up this range, which is made in any style desired. Other goods shown are the Ideal open heater, new last year, now provided with a shaking, draw-center grate; the Ideal square self feeder, a standard stove for the past 12 years; the Mystic six-hole range, shown in several styles and sizes; the Mistletoe sheet-iron surface burner; the Standard oval heater; the Royal Standard square sheet-iron heater; the six-hole Home Kitchener range, which is adapted to brick setting or for portable use; the double-oven Mystic range; the Magee Standard six hole range, one of the company's oldest patterns, but improved with the progress of the times; the Hotel Kitchener eight hole double-oven range, with high and low warming closets, intended to be brick set or portable, shown connected with a boiler just as it is set for use; the Boston wrought iron warm-air furnace, with casing partly removed to enable the interior construction to be seen, and the Boston combination warm-air and hot-water heater, also partly unjacketed to show the interior construction.

HOWARD THERMOSTAT COMPANY

of Syracuse N. Y., exhibit their device as attached to a furnace. The thermostat is placed some distance above the furnace, fastened to a post. Chains pass from it to the furnace damper over pulleys. So sensitive are the metals forming the thermostat that the heat of a lighted match is sufficient to instantly cause the damper to move, closing the draft side and opening the check side. The damper is an ingenious device, being a brass cylinder 8½ inches long and 10½ inches in diameter, with a partition through the center, dividing the draft from the check. Slots extend lengthwise through the cylinder, those on the check side alternating between those on the draft side. This damper is placed in a horizontal pipe on the exterior of the bottom of the furnace, with the check and draft sides properly connected with the furnace. It revolves on a pivot, so that it is easily moved by the thermostat, which has no working parts about it to get out of order, depending entirely for its action upon the expansion and contraction of very sensitive metals.

RIDGWAY FURNACE COMPANY

of 76 Union street, Boston, exhibit the Ridgway revolving open fire pot heater. The specimen shown has the jacket partly removed, to enable the interior construction to be easily comprehended by the observer. In this furnace the grate remains stationary, while the fire pot can be turned by means of a crank placed at a convenient hight, the pot revolving on balls, which bear on perfectly flat surfaces. It is claimed that the ashes are scraped from the fire without massing the coals, that the combustion of fuel is complete, that there is no waste of unconsumed coal, that direct radiation is had from the sides of the fire as well as the top, that slow fires are easily maintained and that putting on coal does not smother or retard the fire. A gold medal was awarded this furnace in 1892 by the Massachusetts Charitable Mechanic Association for superiority and economy, being the highest award given a furnace for over 35 years.

W. A. DAGGETT & CO.

of Vineland, N. J., with a number of branch offices in leading cities, exhibit Daggett's patent Russia iron, self basting roaster and baking pan. This pan is an old and well-known article in culinary circles, intended for roasting poultry, meats and fish, and baking bread, cake, puddings, beans, &c. It is made in eight sizes. The manufacturers state that over 500,000 have been sold.

P. T. BENBOW,

1814 and 1816 North Eighteenth street, St. Louis, exhibits a self-heating washer, which is a washing machine of the square type with a gasoline stove attachment to heat the water used. The bottom of the washer is of galvanized iron, and the burner under it heats the water quickly. The clothes are moved over rollers in a "roller bed" above the bottom of the box by a rubboard, with holes in it to cause a suction which forces the suds back and forth. The special claim made for this machine is that it can be used anywhere, so that washing can be done in the coolest and most pleasant spot available. The stove, being portable, goes with the washer, instead of the washwoman being compelled to work in a hot kitchen to boil her clothes on the cook stove. The gasoline stove can be detached and used for other purposes when not needed for operating the washer.

B. B. JOHNS,

12 North Seventh street, Philadelphia, has an exhibit of stove polish. A toy stove on a high stand serves to point the moral and adorn the tale of this exhibit.

The Fuller-Warren Company.

We are indebted to the Fuller-Warren Company, Milwaukee, Wis., for a copy of an exceedingly attractive catalogue of the line of stoves, furnaces and ranges made by them. The volume is issued in book form, having 160 pages, bound in stiff board covers with side titles in black and silver letters. The printing is in two colors, the body of the page being in black, while in the upper outer corner of each page is an ornamental piece, embracing the letters "F. W. Co.," and brief reference to the line of goods manufactured. A telegraphic code, an illustrated description of the patent oval fire box used in the company's ranges, and of the direct damper arrangement employed, are features of the opening pages. The F. & W. Co. Stewart range for 1893 is first considered, following which we find the Matchless, the Signal Stewart, Royal Diamond and National Diamond ranges, made in several styles and sizes and embodying the modern improvements. The F. & W. Co. wrought-steel range is shown in several modifications, while descriptive letterpress tells the number of sizes in which it is made, the dimensions of the oven and code words for convenience in ordering by wire. A long line of attractive cook stoves is presented under such names as Stewart, Signal Diamond, National Diamond and Popular Diamond. The heating stoves occupy about one-half of the catalogue, the leading place being given to the P. P. Stewart base burner for 1893. This stove met with a large sale last season, which justifies the makers in believing that, with the new improvements which have been since added, it will continue to take high rank in the estimation of the trade. The Splendid base burner for 1893 is a new heater for this year, fitted with Ransom's combination duplex grate, patent sectional fire pot, swing top with automatic acting magazine cover, large hot-air flue circulation and handsome finish. The F. W. Company Splendid for 1893 is made in two sizes

for anthracite coal and has had new base skirting added for this season. At the request of many of their customers the company have incorporated in this year's catalogue a brief sketch of P. P. Stewart, after whom several of the stoves made by the company are named. A varied assortment of oak, globe, cannon, laundry, box, Todd, cottage parlor and Franklin stoves contribute to the general line of goods shown. The catalogue concludes with an illustrated notice of the furnaces made by the company, suggestions for ordering repairs, price-list of fire brick and a general index.

The Royal Aladdin Base Burner.

Burdett, Smith & Co. of Troy and Chicago have just placed upon the market a new base burner known as the Royal Aladdin. It is one of the handsomest heaters which the firm have ever produced, the patterns being entirely new and many improvements embodied which are not usually found in stoves of this style. The ornamentation is rich and artistic, the proportions graceful and the general design of a character to please the eye. Nickel has been judiciously employed to produce the desired effects, while the large area of mica illumination gives to the stove when in operation a bright and brilliant appearance. The manufacturers refer especially to the excellent workmanship on the patterns, the beauty of the castings and the manner in which the parts are put together. Constructively, the Royal Aladdin is an excellent example of the best type of the modern base burner. The fire pot and grate are so disposed that they can be easily removed for repairs. By the simple loosening of two bolts in the central ring the front half is detached, when the fire pot can be drawn out through the front without trouble. The stove is also fitted with the Ransom duplex grate, which can be operated in such a manner as to slightly shake the portions of the fire around the outside of the fire pot where most needed, while clinkers can be cut out of the center. The fire pot can also be cleaned of ashes at the bottom when necessary. One of the important features of the stove is the system of hot-air circulation. This is accomplished by means of a large flue on the back of the stove, between the main flues. This flue extends from the base to the tea-kettle section, then divides into two flues on either side to the extension dome at the top, where the hot air is discharged into the room. The back plate forming the heating flues is cast in one piece, with a hollow section between the flues, which, when covered by a loose plate, forms a circulating flue without puttied joints. This is entirely outside of the stove, and thus avoids any possible escape of gas into the room. The makers also claim that the arrangement gives a large heating surface to the circulating flue, and, as the cold air drawn through it from the floor passes through the stove in a highly heated condition, a constant circulation is maintained. A feature of the illumination is found in the contour of the mica sections, both upper and lower of which are made on curved lines instead of straight. This, it is said, increases the illuminating power of the doors, which, with the swell of the front, gives a spherical effect to the body of the stove and adds greatly to the illumination of the fire, as well as increasing its radiating power. The nickel parts of the stove have been constructed with a view to simplicity of arrangement and they can be easily packed and protected for shipping or storing. This feature is much appreciated by dealers handling the stoves, as great economy of time results thereby. The stove is so made in all its parts that there are no joints visible in the front or sides.

The Future of the Hot-Air Furnace.

By A. W. Gleßner.

President of the Excelsior Steel Furnace Company, Chicago, Ill.

In a former article on the above subject I referred to the increased interest taken by dealers in hot-air furnaces in the science of such heating, with the result that the standard of furnace work is being constantly raised from year to year. This interest, while deeper now than formerly, is not new in the trade, and in evidence I refer to *The Metal Worker* competition in house heating by furnaces which took place some years ago, and which brought out papers and opinions from dealers in various parts of the country, though chiefly from the territory east of the Mississippi, showing that dealers at that time were alive to the importance of a thorough knowledge of hot-air heating. Should this competition be repeated it would be found that the interest in it had extended in the interim to points in remote corners of this country where five years ago a furnace was unknown. Dealers have learned that to do good work a furnace must be properly located and set, and that careful study must be given to each job if the best possible results are to be obtained. That furnace dealers are aware of these facts is apparent from the demand that has set in for literature on the subject of hot-air heating, and also for the number of plans that are sent to the leading furnace makers with requests for information in regard to the size of furnace, location of same, together with the locations and positions of the connecting pipes and registers, in order that the buildings contemplated in these plans shall be thoroughly heated. Nor is this interest confined to the dealer alone nor to the house owner, but it has spread to the architect and builder, and rarely a day passes that does not bring to the office of our company a set or sets of plans from architects and builders requesting that the heating be diagrammed, and the prospect is that in the near future we will be compelled to organize a department devoted to this class of work.

The interest taken by the architect or builder and his apparent willingness at the present time to co-operate with the heating contractor augurs well for the future of the hot air furnace, for the time was, and not very long ago, either, when no consideration was given by either architect or builder to the heating, and no provision was made for the concealed pipes, with the result that when the heating was to be installed the building had to be cut and hacked to pieces to find places for the pipes, whereas a little planning and forethought would have provided the channels needed without extra expense in material and very little additional labor. All architects are not showing a disposition to consider the heating contractor, and, indeed, the percentage of architects who are evincing such a disposition is still very small, but everything points to a general change in the position taken by the architect and builder in the past, and a time is surely coming when the architect will consider the heating fully as much as he now considers the foundation or plumbing.

The dealer in furnaces, by becoming posted on the principles of hot-air heating, is able to impress upon the architects with whom he comes in contact in his work the importance of correct planning in advance of construction, and gradually the architects will wheel into line.

What the Manufacturer is Doing.

The manufacturer of hot-air furnaces is doing not a little to advance the interests of the dealer by supplying him not only with better goods than formerly, but also has provided not a little help in the way of useful hints through the salesman and printed matter sent out to the trade. While this help has been gratuitous and sometimes without great value, it has all helped to educate the dealer and to improve the standard of work done, and thus has led to a larger sale for the heaters made. It is of great importance to the trade that all work that is done is done well, for the reason that one bad job in a town reflects discredit upon the hot-air heating as a class, and often leads to the introduction of other methods of heating.

An examination of the catalogues sent out by the furnace makers does not indicate that the hot-air furnace is in its dotage. Each year's edition exceeds in size and completeness the productions of the preceding year and shows a constantly increasing list of satisfied users of the apparatus, which does not coincide with the view expressed by the stove makers. Of course these catalogues do not give the names of the dissatisfied buyers, but in proportion to the number of purchasers I incline to believe that the percentage of the malcontents would be fully as small as in any other branch of heating.

More detailed information is given in these catalogues than formerly, and in one or two plans are given showing the location of furnaces and registers.

One manufacturer has expended this season more than $3000 on a catalogue in an endeavor to supply accurate information regarding hot-air heating in general, and *The Metal Worker* has reproduced a good portion of this work. All this indicates a faith in the future of hot-air heating, and if anything more convincing is needed it can possibly be found in the sales of furnaces, to which I expect to refer later.

(*To be continued.*)

The Sill Stove Works.

One of the neatest stove catalogues which have recently come to hand is that issued by the Sill Stove Works of Rochester, N. Y. It is of a size to render it especially convenient for reference, while the arrangement of the matter gives evidence of careful attention to details and due consideration of the requirements of the stove dealer. It is nicely printed on a good quality of paper and bound in flexible cloth covers of a deep green shade. The first 63 pages are given up to a presentation of the leading styles of the Sterling line of ranges. The goods presented embrace four complete lines of six-hole ranges and one of four-hole ranges. The Sterling is a first-class construction embodying the latest features, one of the special points being the transparent ventilating double oven door. The inner or transparent door has around the outer edge of the mica frame an opening through which the air passes

into the oven. This does not allow cold air directly into the oven, as before it reaches the openings it comes in contact with the warm air which is inclosed between the two parts which constitute the double door. Perforations in the back oven plate allow the air in the oven to escape to a flue which carries it to the chimney. When the two doors are closed the appearance is that of an ordinary oven door, but when the outer portion is open the contents of the oven can be readily seen without danger of lowering the temperature of the oven. The Quick Sterling six-hole, the Home Sterling and the Quick Sterling four-hole are the names under which some of the other goods are made. An interesting feature of this catalogue is an illustrated description of the lock center employed, as well as of the plunge damper and of the sectional cover used in connection with the Sterling goods. The wood cooks include the Bright Sterling, Humbert and Amity, while those adapted for burning coal or wood include the Star Sterling and the Sterling "E." The heating stoves occupy the closing portions of the catalogue, and are represented by the Sterling Ventilator, which is in its sixth year; the Silver Sterling, a new construction to which reference has already been made in these columns; the Parlor Sterling, a medium-priced heater; Ideal Sterling, a low priced construction; the Advance, a neat cottage parlor stove made in several sizes; the Sterling Cottage, made in two sizes direct draft and two sizes with return flue; the Champion, a neat box stove for wood only, and the Torpedo, an all-cast cannon stove in five sizes. A price-list of brick linings, mica and sundries, an index to the code words and a general and alphabetical index are features of the catalogue.

ODD PLATES.

Egley Bros., Onarga, Ill., have issued a neat little catalogue descriptive of the Owen patent wood stove, which they manufacture. This is a stove of similar appearance to the well known Todd type. It is furnished plain or with a nickel foot rail along one side and nickel horns on the top at the front and at back. The flue construction is such as to compel the heat to pass entirely round the stove. The manufacturers state that it will retain fire from one to three days. The catalogue contains cuts of the separate parts of the stove, numbered for the convenience of patrons in ordering repairs.

The Michigan Stove Company favor us with one of the perpetual desk calendars which they are now distributing to the trade. There are three circles on a beautifully lithographed card, a large circle for days of the month and two small circles for months of the year and days of the week. Ornamental pointers are eyeletted in the center of each circle, to be moved with the change of date. The card is braced to stand upright. The conception is very pretty, and the souvenir will be appreciated by those into whose hands it may fall.

James Boyle & Co., Salem, Ohio, send us a calendar for the month of July, embellished with a general view of their Perfect Oak. This is an attractive construction embodying the modern features, and is offered the trade as a powerful heater. All the doors of the stove are fitted against lap joints, the doors being fastened with turnkeys and latches. Beneath the picture of the stove is a calendar for the month, the printing being in dark green ink on a white ground. The name of the company and of the stove, together with the address of the agents for the Northwest, are printed in red. The grate for coal is of the shaking and dumping type, while that for wood is a double cut-off grate having special shaking arrangement. The ash pan is extra large and all draft slides are wedged so that when closed they are air tight. The manufacturers guarantee this stove to keep a wood fire over night. It is offered the trade in four sizes, Nos. 12, 14, 16 and 18.

The Barstow Stove Company are keeping up their reputation as distributors of 4th of July advertising novelties. We received from them during the early part of the week what at first glance appeared to be a large powder cracker, it being flat, however, instead of round. Untying the string forming the fuse we found that the device consisted of a folder, on the inside of which was the name and address of the company, together with advertising matter relative to the Bay State furnaces, ranges and stoves. It was also stated that "Independence in trade is often as important to individuals as independence has been to our great American nation. It frequently depends upon the line of goods handled as to how soon the stove dealer may become financially independent." The device is copyrighted by the Livermore & Knight Company of Providence, R I., and is in keeping with many other novelties which they have gotten out.

S. R. Wells, Indianapolis, Ind., is sending out circulars of the Model Oak, a new stove made in four sizes. The features include an ash pit cast in one piece and having a screw-wheel damper in the ash door. All doors are tightly fitted and the air supply to the fire can be adjusted very closely, so that a guarantee is made that a fire can be kept at least 48 hours. The new Model Gas is another novelty, adapted for either coal or gas, and having, in addition to the burner, a draw-center grate, fire-clay linings and a fire-clay deflector. It is made plain and richly ornamented with nickel and tile pilasters, nickel top ring, nickel dome, nickel urn and a nickel foot rail.

Stoves are not the only production of the Indianapolis Stove Company, Indianapolis, Ind., for a fine line of ground hollow ware greets the eye of the customer as he goes through their showrooms. Their new line of oak stoves is known as the Columbia, and in style of carving and nickel trimmings is worthy of the Columbian year. Not finding our friend Bennett on deck when we called, we enjoyed the hospitality of the house dispensed by other hands.

The Western Stove Works of Peoria, Ill., refer to their Lake View Oak parlor stove as possessing features peculiarly its own. No bolts are employed in fastening the foot rails to the stove, as they are secured in place by wedged lugs. The fret work jacket is easily removed when necessary to polish it, the ash pan is large, the fire pot heavy, and the adjustable damper in the pipe collar of such a character as to give perfect control of the fire.

At a meeting of the stockholders of the Girard Stove & Foundry Company, held on the evening of Tuesday, June 27, the following directors were elected: H. B. Shields, Thomas Parrock, Frank Williams, W. J. Wallace, B. F. Briggs, William Fair and Edward Kennedy. The directors then held a meeting and elected H B. Shields president, Thomas Parrock vice-president, Frank Williams secretary and treasurer, W. J. Wallace general manager and B. F. Briggs superintendent sales department.

Kruse & Dewenter, Indianapolis, Ind., are still hearing good reports from their furnaces and the service rendered last winter. A point they always endeavor to clearly demonstrate to a prospective buyer is that furnaces of large capacity are more economical and cheaper in the end. In consequence their wrought-steel warm-air furnaces are increasing in popularity.

Recently the Excelsior Quartette of Troy, N. Y., gave an enjoyable concert and were royally entertained at the residence of W. A. Clark of the Phillips & Clark Stove Company at Geneva, N. Y.

F. M. Borden & Bro., Philadelphia, though still occupied in sending out gasoline stoves and refrigerators, are preparing for the fall. This year finds them with a full line of the Novelty stoves as leaders, and the line of Leaf stoves will not be the second choice with many buyers.

Several thousand "What's Inside" circulars were distributed at the Industrial parade, at Tamaqua, Pa., on the Fourth by E. J. Fry. The inside pages showed some of the handsomest and best of the Novelty stoves and ranges made by the Abram Cox Stove Company of Philadelphia.

J. H. Nevins of the Laura Nevins Range & Heating Company, St. Paul, Minn., informs us that among recent orders taken by him at the World's Fair, Chicago, were the following: One range, to be shipped to G. D. Y. Scholtz, Claremont, Cape Town, South Africa, and two ranges to P. T. D. Wessels of the same place.

The Chicago Foundry Supply Company, whose Peerless Facing Mills are at Eighteenth and Rockwell streets, Chicago, have opened an office at 503 Teutonic Building, southeast corner of Washington street and Fifth avenue, in that city. They invite visiting foundrymen to call upon them at this central location, where every facility will be provided for attention to needed correspondence. The favor will doubtless be acceptable to many of those who are now making the pilgrimage to the World's Fair.

The Abram Cox Stove Company of Philadelphia are preparing to remove their offices and salesrooms, at present established on North Second street, in that city, to the new building adjoining their Dauphin and American streets foundry. We understand that the building will be ready for occupancy about the end of the present month. The new building is of brick and covers an area 45 x 450 feet, and with its six floors will afford about 125,000 square feet of floor space.

George M. Clark & Co , 153 to 161 Superior street, Chicago, seem to be among the few large establishments not affected by the depressed trade conditions. Their orders for gas and gasoline stoves and ranges are considerably ahead of last year, and they have recently been obliged to assume occupancy of another floor in their factory building to increase their facilities. Their business so steadily increases that it will be but a question of time when they will outgrow the accommodations at their present

location. They have a fine collection of their goods on exhibition at the World's Fair in the Manufactures and Liberal Arts Building, northeast quarter, Section O, Block 3, No. 76. In connection with this exhibit they are distributing what they term "A True Guide Through the World's Fair Grounds." It is only a leaflet, which can be put in the pocket without folding, but it gives a diagram of the grounds, and names all the points of interest.

W. H Switzer of the Superior Furnace Company, Little Falls, N. Y., passed through Chicago last week on his way home from a four weeks' trip, during which he had visited 24 large cities, from St. Paul to Portland, Ore., and from San Francisco back to Chicago. His trip he reports very successful, in view of the depressing financial conditions. Dealers throughout the West complain that business has been much interfered with; but in all parts, except in the silver producing sections, the opinion prevails that the worst has been passed and a good trade is expected during the late summer and fall months. Mr. Switzer has formed connections in many of the new and prosperous towns in Western territory for the Superior furnace, and is much encouraged over both the present condition and future prospects.

"Miscellaneous Catalogue No. 2," issued by J. W. Paxson & Co., Philadelphia, relates to foundry supplies and equipment, and gives a very full list of miscellaneous goods of this sort that will be of interest to molders generally. The pamphlet, of small size, contains some 40 pages of letterpress, is bound in paper covers, and illustrates and briefly describes, besides giving a price-list, an extensive line of foundry supplies. Drying stoves, lamps, bellows, brushes, clamps, crucibles with rammers, shovels, patent letters, buckets, watering pots, chaplets, flasks of various sorts, barrows, emery, core oven, griddles, stove cement, Dr. Kirk's chemical compound and similar goods are included.

The adjourned meeting of the stockholders of the MacKellar Foundry Facing & Supply Company was held at the company's office at Quincy, Ill, on Monday, the 3d inst. The following directors were elected: James Woodruff, Gen. James D. Morgan, M. K. Weems, W. H. MacKellar and W. H. Woodruff. The directors then elected the following officers to serve the ensuing year: President, James Woodruff; treasurer, M. K. Weems; secretary, J. R. Woodruff. James L. Haight was appointed superintendent of manufacture *vice* W. H. MacKellar, whose resignation was accepted by the directors at their meeting on May 1. This company report a successful business for the past year and a bright outlook for the future, owing to the improvement in quality of their facings, made under the direction of Mr. Haight.

We are indebted to secretary D. M. Thomas for a copy of the pamphlet containing the minutes of the eighth annual meeting of the Stove Founders' Association held at Chicago, May 30 of the present year. It is a work of 20 pages, bound in colored paper covers, and in addition to the minutes of the association named, there is presented the address of president Henry Cribben.

"What's Inside?" is the query embossed in gold on the front of the very handsome set of gilt-edged photo-tablets which the Abram Cox Stove Company of Philadelphia are sending out to the trade. The set consists of five gilt-edged tablets, each 6½ x 4½ inches, the whole fastened by a blue silk cord in such a manner as to allow of opening lengthwise. Four of the tablets contain burnished photo-engravings of the company's leaders in the line of base-burning square heaters, the Radiant Novelty, Parlor Novelty, Palace Novelty and Starling. The back of each tablet preceding the pictures is devoted to a description of the stove facing it, with a list of prices. A somewhat novel semi-circular thumb indent is cut at the foot of each tablet, and the name of the stove appears immediately above it. The familiar trade symbol adopted by the company occupies the back of the last tablet in the set.

The Leaf Stove Company of Philipsburgh, N. J, are sending out to the trade a handsome card folder, containing a photo print of the Maple Leaf range. The page opposite the print announces that the Maple Leaf is the initial number of a series of first-class ranges and stoves which the company purpose offering to the trade this season. A typewritten circular letter is inclosed with the folder, calling attention to the new range and fully describing it. The Maple Leaf, it is claimed, has large sheet flues, correctly proportioned fire box, perfect working duplex grate, a large ash pit, top plate cut in four pieces, crosspieces heavy and braced, long centers cut and reversible and heavy covers, with ribs on the side exposed to the fire, making them proof against cracking or warping. The range is also provided with a hot-air attachment. While the Maple Leaf will be their leader in the six-hole range line, the Holly Leaf will be their leader in the five-hole styles. Both ranges are now ready for the market. The company expect to have ready for the market, in August next, the Ivy Leaf, which they state will be a base burner of first-class design. All the productions of the company will be sold under the general surname—Leaf.

The Grander Stove Company, with office and works at Royersford, Pa., are vigorously pushing the sale of their square parlor heater known as the Mars. It is made either straight draft or full revertible flue, and is offered to the trade in three sizes. The stove is cheap in price but of first-class construction and is tastefully ornamented with nickel and art tile. The company are also directing attention to the Volga, a double heater made in two sizes with full revertible flue. It is of neat design and embodies, among other features, the latest improved grate, dust flue and parts so arranged that a section of the front of the stove can be detached, thus making the removal of the magazine very easy. In their announcement this week the company state that they will send, on application, circulars giving prices and description.

The many friends in the stove trade of W. E. Hopkin will be glad to know that a cordial welcome at his hands awaits them at the house of F. M. Borden & Bro., Philadelphia, where, as general superintendent, his training and experience will find a scope for usefulness.

The stove and hardware men added no small part to the success of the celebration at Troy, N. Y., on Independence Day. R. C. Reynolds had several floats, one of which carried several styles of handsome Gold Coin stoves. One of H. D. Hull's handsome wagons contained a fine display of his oil stoves in various designs. The Phillips & Clark Stove Company had a float 8 x 15 feet in dimensions, on which were displayed a variety of designs in the stoves manufactured by that concern. An orchestra also rode on the float and discoursed pretty music. The attendants to the horses were attired in Indian costume. Two carriages contained the traveling representatives of the firm, and in others were the local stove dealers. W. E Sandbam made a fine display of stoves and ranges, fully nickel plated. George H. Cole had two floats, one displaying nickel-plated stoves and ranges, and the other a line of gasoline stoves.

A reminder that the baseball season is on us has come in the shape of a score card from the Michigan Stove Company. It can be used as a counter for other games as well, consisting of two cardboard disks, which revolve between two other pieces of cardboard. Figures on the disks show through holes in the frame.

The Kelsey Furnace Company, Syracuse, N. Y., have established their Western agency with the Cook Range & Stove Company of 173 Lake street, Chicago, instead of their former agency at Evanston, Ill. The new agents are so familiar with this line of business that their indorsement of the products of the Kelsey Furnace Company by taking the agency is referred to as evidence of the merits of the goods.

George M. Clark & Co, 153 to 161 Superior street, Chicago, send us a very pretty catalogue of the Jewel gas stoves. The matter is neatly printed on a good quality of paper, and the binding is in colored covers of attractive design. In their annual greeting to the trade, the company state that they have added 11 entirely new gas appliances to their assortment this year, and have remodeled two, so that they are practically new. The opening pages of the catalogue are devoted to Jewel gas burners, which are shown in great variety, following which attention is invited to the Jewel ranges. These are offered in great variety and are exceedingly neat and tasteful in appearance. Nos. 350 to 353 cover a line which the company have just added to their assortment, and these embody all the latest improvements. At the left side of the range is a water back, while at the right is a large warming oven having a long solid burner, and above this, in the upper part of a broiling chamber, is a reversible burner with three caps. The body of the range has a large baking oven with a large roasting oven below. Between them is a set of two burners with four caps each and a pilot light. A variety of Jewel step stoves, Jewel laundry stoves, junior stoves and table stoves are also illustrated and described, together with the Jewel circulating water heater, Jewel baking plates, waffle irons, steam cookers, egg bakers, heating stoves and stove connections. An index to the catalogue is a feature of the closing pages.

The president of the British Institute of Mining Engineers, at a recent meeting of that body, stated that over $720,000,000 was invested in British mines, exclusive of the rolling stock required to convey the produce to its destination. He also estimated that 3,000,000 persons in the United Kingdom were directly dependent upon the mining industry for a livelihood.

TRADE REPORT.

The Iron Market.

The first half of 1893 will be long remembered as one of the most trying that the Iron trade has ever experienced. Transactions during the past week have, naturally, been on a very limited scale, so that the temper of the markets has not been tested sufficiently to judge of their tendencies. Pittsburgh advices indicate that there will be no prolonged shut down of the local mills, and while the chances are that the Valleys and the Chicago and St. Louis districts will follow the lead of Pittsburgh, there is still some possibility of a contest. The Sheet manufacturers and the workmen have agreed upon a scale which is practically the same as the one in force last year.

The stove trade has been in good shape, with an exceedingly favorable outlook for the coming season's business. The depression, therefore, is not owing to any lack of business, but to the exceedingly low prices, and more recently to the disturbed condition of the money market.

Pig Iron.— Current business in the New York market is very light, and although makers of standard Northern brands acknowledge that they are accumulating Iron, they report that it is confined to the lower grades, and that the Foundry Irons are moving off in a satisfactory manner. Intimations are thrown out that Southern furnace interests may reach some agreement concerning concerted action in reducing output. We quote Northern brands at $14.50 @ $15 for No. 1; $13.75 @ $14.50 for No. 2, at tidewater. Southern Iron, same delivery, $13.75 @ $14 50 for No. 1; $12.50 @ $13.50 for No. 2; $12 @ $12.25 for No. 3; $12.25 @ $12.50 for No. 2 Soft, and $12.75 @ $13.25 for No. 1 Soft.

Quotations have changed very little in the Philadelphia market during the past six months, although there has been some variation in selling prices. Taking the entire six months it is not likely that prices have gone either higher or lower than $14.50 @ $15.50 for best brands of No. 1 Foundry, $13.75 @ $14.25 for No. 2, and $12.75 @ $13.25 for Gray Forge, and $12 @ $12.25 for Alabama Irons. Ordinary grades (or in the case of forced sales) may have sold at 50¢ @ 75¢ less, but the figures named give a fair average for the various brands of standard Irons during the period under review.

There is no buying being done in Pittsburgh markets, and with production going steadily on, stocks are being increased and prices are showing a much weaker tendency. Prices quoted are merely nominal, as there are no sales being made on which to base quotations.

No. 1 Foundry	$13 50 @	$13.75	cash.
No. 2 Foundry	12.50 @	12.75	"
Charcoal Foundry No. 1	17.00 @	18 00	"
Charcoal Foundry No. 2	16.50 @	17.00	"

At Chicago the only transactions reported during the past week covered moderate quantities of Local Coke. The full effect of the large contracts placed the previous week has not yet been felt by the Iron trade, as it would require some little time for such information to get disseminated. The following quotations represent the range of asking prices, Chicago delivery, but they are still subject to concessions in nearly every case for immediate delivery and prompt cash:

Lake Superior Charcoal	$16.00 @	$16.25
Local Coke Foundry, No. 1	13 50 @	14.00
Local Coke Foundry, No. 2	13.00 @	13.25
Local Coke Foundry, No. 3	12.75 @	13.00
Local Scotch	14.0 @	15.00
Ohio Strong Softeners	15.75 @	16.25
Southern Silvery, No. 1	@	14 50
Southern Silvery, No. 2	@	14.00
Southern Coke, No. 2	12.75 @	13.00
Southern Coke, No. 3	12.25 @	12.50
Southern, No. 1, Soft	12.75 @	13.00
Southern, No. 2, Soft	12.25 @	12.50
Southern Gray Forge	11 75 @	12.00
Tennessee Charcoal, No. 1	16.50 @	17.00
Alabama Car Wheel	@	18.85
Coke Bessemer	14.50 @	15.00
Hocking Valley, No. 1	16 75 @	17.00
Jackson County Silvery	16.75 @	17.00

In the Southern markets there has been a light volume of business in Pig Iron during the month, but the general conditions do not appear to be any worse. Buyers in easy financial condition have made some purchases on favorable terms, but the exact figures accepted for cash are not made public, while the strong Iron companies in the South are contending for full prices in the regular way. Quotations are as follows:

Foundry.

Southern Coke, No. 1	$13.00 @	$13.25
Southern Coke, No. 2	11.50 @	11.75
Southern Coke, No. 3	11.00 @	11.25
Ohio Soft Stone Coal, No. 1	16.00 @	16.25
Ohio Soft Stone Coal, No. 2	15.00 @	15.25
Lake Superior Coke No. 1	15.00 @	15.25
Lake Superior Coke No. 2	14.00 @	14.25
Hanging Rock Charcoal, No. 1	18.50 @	19.00
Hanging Rock Charcoal, No. 2	17.50 @	18.00
Tennessee and Alabama Charcoal, No. 1	15.00 @	15.50
Tennessee and Alabama Charcoal, No. 2	14.00 @	14.50

Metal Market.

Copper.—The buying has been extremely conservative and the demand has continued tame in the face of the report that nearly all American producers outside of the Tamarack, Boston and Montana and allied interests have signed the international agreement to restrict production and limit exports from this side of the Atlantic during the balance of the year. In short, the appearances are that there is still more than enough Copper of all kinds to meet home trade and export wants, since consumptive requirements are disappointing as far as volume is concerned, while export buying is tame in all that the term implies.

Pig Tin.—The winding up of old contracts has been the most conspicuous feature in the speculative branch of the market and the outcome shows that operators on the long side have fared the worst not only on July but on August options. July went as low as 18.85¢ under pressure to realize, and August to 19.30¢ @ 19 35¢ in the face of cable advices indicating some recovery from late depression in London.

Pig Lead.—The real and threatened shut down of silver mines, along with recent clearance of surplus stocks of Lead at Western points, has served to stiffen prices considerably. At the present time 3.55¢ would appear to be a strictly inside price, and 3.60¢ stands as the general quotation for common Western, while offerings of other than comparatively small lots for prompt delivery or immediate shipment are extremely reserved. There is no inclination to entertain offers on August or later deliveries except at very stiff prices.

Spelter.—Ordinary Western brands have been offered quite freely at 4.20¢ landed here, but, aside from single carload lots occasionally, no sales were effected and the market remains in a dull flat condition. Orders were solicited for larger quantities at 4.15¢, with anything but satisfactory results. As the above outline would indicate, the market is still in poor shape and the undercurrent is highly suggestive of weak position.

Antimony.—The demand has continued slow and the market is still rather weak, with sellers of wholesale quantities at about 9⅞¢ for Hallett's, 10⅛¢ @ 10¼¢ for L X, and 10½¢ for Cookson's.

Tin Plate.—Slow trade and irregularity of prices, with the tendency in buyer's favor, is about all that can be reported. Interest in future deliveries continues extremely tame, despite inducements that have been offered in the shape of modified prices, and spot stock has been taken in very small quantities, although cheaper nearly all along the line at present than for some time past. Stocks here are liberal and the assortment is remarkably good.

Chicago Report.

Scrap.—Trade is very dull. Dealers quote the following buying prices:

	Per net ton.	Per lb
No. 1 Wrought Scrap	$10.00	....
Machinery Cast	7.50	....
Malleable Cast	7.00	....
Stove Plate (free of burnt)	5.00	....
Burnt Iron and Grate Bars	4.00	....
Sheet Iron and Hoops	3.00	....
Plow Steel and Breaking Stock	6.00	....
No. 2, such as Shovels, Hoes, &c	4.50	....
Old Boilers—whole (Iron)	6.00	....
" (Iron)—cut in single Sheets and Rings	9.00	....
Old Gas-Pipe and Boiler Tubes	6.00	....
Cast Borings	3.50	....
Turnings	5.00	....
Horseshoes	10.00	....
Copper Bottoms	....	7 ¢
Copper Clips and Heavy	....	8½¢
Heavy Brass	....	7½¢
Light Brass	....	4 ¢
Pipe Lead	....	3 ¢
Tea Lead	....	2½¢
Zinc	....	2¾¢
Rubber	....	2¾¢

Anthracite.—There is hardly any movement at present. Dealers quote carload lots of 12 net tons as follows:

	Grate.	Egg, Sto. and Ch.
Chicago, Ill	$5.85	$6.10
Milwaukee, Wis	5.85	6.10
Kansas City, Mo	9.05	9.30
Council Bluffs, Iowa	9.05	9.30
Lincoln, Neb	9.20	9.45
Sioux City, Iowa	9.05	9.30
Aberdeen, S. Dak	9.10	9.35
Dubuque, Iowa	7.15	7.40
Madison, Wis	7.35	7.60
St. Paul, Minn	8.35	8.60
Burlington, Iowa	7.35	7.60
Des Moines, Iowa	8.80	9.05
Davenport, Iowa	7.15	7.40
St. Joseph, Mo	9.05	9.30
Leavenworth, Kan	9.05	9.30
Omaha, Neb	9.05	9.30

Colorado Anthracite.

COLORADO FUEL & IRON COMPANY.

Denver	$8.00
Pueblo	8.00
Colorado Springs	8.00
Leadville	8.00
Cheyenne, Wyo	10.00
All points between Denver and Missouri River	9.35

UNDER DATE OF JUNE 30 the copartnership heretofore existing between Robert Roger Haydock and Eugene Bissell, under the firm name of Haydock & Bissell, 12 Murray street and 15 Park place, New York, was dissolved by mutual consent. R. R. Haydock retires to assume the position of sales agent of the Bethlehem Iron Company, in charge of their office at 421 Chestnut street, Philadelphia. Mr. Bissell will continue the auction and commission business at the former stand in connection with E. V. N. Bissell and Frank Van Name, under the firm style of E. Bissell, Son & Co. The new firm assume all the assets and liabilities of the old concern.

SPECIALTY MFG. COMPANY is the name of a concern who have recently commenced the manufacture of wringers, clothes washers, step, common and extension ladders, rat traps, lemon squeezers, &c., at Titusville, Pa. The officers of the new company are as follows: L. T. Gorenflo, president; D. J. Whitney, secretary, and R. L. Rice, treasurer. Mr. Gorenflo was connected with the F. F. Adams Company of Erie, Pa., for 20 years, during the last six of which he held the position of superintendent of their factory. Mr. Whitney has also been connected with the F. F. Adams Company for the past six years. The company's factory was started June 1 and we are advised that they are now in full operation.

CONDITION OF THE

Hardware Trade.

THE PAST WEEK, with the turn of the half-year and the national holiday, has naturally had but a limited volume of business, and July opens with the usual midsummer inactivity in trade. For the past few weeks manufacturers have been preparing for the usual shut down for a longer or shorter time in order to make repairs and to put things in shape for future operations. Travelers also are nearly all at home, and merchants generally are refraining from pressing sales. In a week or two it will be feasible to compare the aggregate of the six months' business with that of previous years, and it is hoped that the result will not be altogether unsatisfactory. Little of importance in the matter of prices has developed since our last report, but while the market is not characterized by a strong tone there have been comparatively few open declines. The large trade and manufacturers are feeling the effect of the disturbed financial conditions which prevail, but throughout the country generally a fairly satisfactory business is being done by the smaller trade.

Careful inquiry among retailers, as well as advices from commercial travelers who have recently been in close contact with them, develops the fact that in many parts of the country, in the smaller towns and villages especially, retailers are not feeling the depression which exists in many of the larger centers of trade. Reports indicate that their business during the past half year has been fully up to the average, and while there is some complaint in regard to collections it is evident that many of them are suffering little from this cause. As an illustration we give the following extract from a letter from a representative house in Western New York:

The financial disquietude of the West and in the cities of the East has not as yet reached the country towns of Western New York, and we are living in hopes it will not, as our banks are not speculative banks and have not been obliged to call in their loans, but are very careful in making new loans. Ours being a farming country, is a little depressed on account of the low price of wool and other products, and collections are slow.

Similar advices come to us in the following communication from a Hardware firm in one of the prominent manufacturing cities of Connecticut:

We are fortunate to live and do business in a very conservative and healthy community. Financially, we have as yet felt little of the effects of the monetary disturbance prevailing at the present time. Our manufacturers are all sound and able to carry on their business without outside aid as to money, and up to this time they have all continued to manufacture goods and keep their hands employed. Our merchants have had a very successful season so far, and very little complaint has been heard from them. Taking all together we should hardly know there was a scarcity of money, except from reading the newspapers. Our local banks have funds at their command equal to any demand that may be made upon them for local business. Building is somewhat held back by lack of funds in savings banks, as out-of-town savings banks are not loaning money here so freely as last year. Yet a drive around our little city will show at least 60 new houses being built. If the situation grows no more serious than at the present time our city will feel very little of its effects.

Advices from Chicago.—A period of dullness has set in in Hardware circles, which is perceptible in every establishment. Orders are numerous enough, but they are for very small quantities, indicating that retail merchants are merely purchasing to cover absolute wants. The quietness is felt in all branches of the Hardware trade and affects all kinds of goods. Prices show no material change. Collections are not improving.

Notes on Prices.

Cut Nails.—Many of the mills have already shut down for repairs, and on account of the condition of the market, the demand being moderate and prices far from satisfactory. They will evidently pursue a conservative course and avoid accumulating stocks, and it is not unlikely that they will shut down for a longer period than usual. The quotation of $1.05 for carload lots at mill still represents the market, but has recently been shaded slightly on regular averages, and with more freedom where the specification is especially attractive. The volume of business, however, is moderate, and the market is decidedly sluggish. Small lots of Steel or Iron Nails from store in New York are quoted regularly at $1.30 to $1.35.

Advices from Chicago.—The condition of trade is about the same as was reported last week. Orders are light and specifications are coming in slowly. Prices remain as before at $1.20 to $1.25, Chicago, for factory lots and $1.30 to $1.35 from store for small lots.

Wire Nails.—There is little new to report in this line. The mills, with perhaps one or two exceptions, have shut down for the month, in accordance with the understanding reached a few weeks ago. This, it is hoped by the manufacturers, will have the effect of giving the market a somewhat better tone and will certainly prevent the accumulation of stocks. While during the month little attention will be given to sales or manufacturing, it is expected that the conferences, with a view to reaching some understanding in regard to improving the condition of the market in this line, will be continued, and the opinion is freely expressed by well-informed parties that the course of things during the past year has impressed upon the manufacturers the necessity of doing something to prevent the demoralizing competition which has prevailed. The general quotation

for carload lots at mill is $1.35, but some of the manufacturers refuse to meet this figure. On the other hand, it has been shaded by others in special cases.

Advices from Chicago.—Manufacturers report a fair demand, considering the general dullness of trade Prices are unsettled, with many wild rumors afloat regarding offers which are claimed to have been made. Notwithstanding these rumors sales are being made at rates which could certainly not be obtained if but part of such reports were true. Prices seem to be confined closely to about $1.45 to $1.50, Chicago, for factory lots. The mills are all closed down in the West. The Joliet Mill has shut down in every department. The curtailment of production is expected by manufacturers to advance prices within the next two or three weeks, especially in view of the fact that stocks are reported light in all warehouses. The stocks held by the manufacturers on June 1 were said to have been the lowest reported for five years, and the reports for July 1 are expected to be equally satisfactory. Jobbers quote small lots from stock at $1.55 to $1.60.

Barb Wire.—The Barb-Wire market is inactive and prices unchanged on a basis of $2.45 to $2.50 for Four-Point Galvanized in carload lots at mill.

Advices from Chicago.—Trade from factory is very quiet now, as is usual in July. The factories generally have suspended operations and will stay closed for the next month or so. Carload prices are unchanged at $2.15 for Painted and $2.55 for Galvanized. Small lots from stock are selling at $2.30 and $2.70, respectively.

Polishes.—The following is the price-list and discount sheet on the Polishes manufactured by the Tanite Company, Stroudsburg, Pa. Each case contains 12 tins, and the company announce that they will not sell less than a case of these goods. Terms 60 days, 2 per cent. discount for cash in 10 days, f.o.b. Stroudsburg, Pa.:

	Per gross.
Paste, put up in 1-pound tins	$36.00
Discount, less than 1 gross, 35 per cent.; 1 gross, 40 per cent.; 5 gross, 45 per cent.	
Liquid, put up in ½-pint tins	36.00
Discount, less than 1 gross, 50 per cent.; 1 gross, 55 per cent.; 5 gross, 60 per cent.	
Gray, put up in 1-pound tins	36.00
Discount, less than 1 gross, 45 per cent.; 1 gross, 50 per cent.; 5 gross, 55 per cent.	
Brown, put up in 1-pound tins	36.00
Discount, less than 1 gross, 50 per cent.; 1 gross, 55 per cent.; 5 gross, 60 per cent.	
Dove, put up in 1-pound tins	36.00
Discount, less than 1 gross, 55 per cent.; 1 gross, 60 per cent.; 5 gross, 65 per cent.	

Mangles.—The Eclipse Mangle is put on the market by the Lang Mfg. Company, Racine, Wis. The prices on this Mangle, and also on the company's Family and Domestic Mangles, are given below, and are subject to a discount of 25 per cent.:

Eclipse, 24 inch	$30.50
" 27 "	33.00
Family	22.00
Domestic, 24 inch	35.50

Granite and Agate Iron Ware.—St. Louis Stamping Company and Lalance & Grosjean Mfg. Company announce that beginning July 1 they will allow an extra discount of 10 per cent. on the following articles in Granite and Agate Iron Wares:

	Nos., inclusive.
Lipped Preserving Kettles	14 to 50
" " "	140 to 600
" Sauce Pans	9 to 30
Wash Bowls, Plain & Ringed	24 to 36
Tea Kettles	20 to 100
"	6 to 9
"	31 to 36
"	16½ to 26½
"	302 to 308
"	60 to 100
"	2 to 10
"	600 to 900

Glass.—The Glass factories have shut down for the summer, thus closing the season of 1892-93. Notwithstanding the unfavorable spring weather and later financial uncertainty, it is believed that the average of trade done was better than for the past seasons. Window Plate and Cathedral Glass have suffered more for lack of demand than Window Glass has. No doubt many of the Window-Glass firms would have been obliged to close down for want of funds to pay the operators' wages even if it had not been the annual time for closing the factories. Most of the Window-Glass houses started about September 2 for the season of 1892-93, and have, as a rule, made an uninterrupted run up to July 1, 1893. Probably the output of Glass was the largest in the history of the trade, while it is reported that the stocks at present in the makers' hands are smaller than usual at this season of the year. Prices, as we have stated before, have been sustained largely through the efforts of the National Window Glass Association. Present indications point to larger output during the next fire than during the past, and also to a more active demand for Glass. The Plate-Glass trade shows a little more activity, and the situation is likely to become stronger as stocks decrease. The New York importers of Glass held a meeting last week, at which no change in prices was made. It was decided to make no contracts for the future, and contracts which expired July 1 will not be renewed. The situation in imported Glass is consequently stronger. Prices remain as follows: American Window Glass, 2000 boxes at one time, 80 and 10 and 10 per cent. discount; carloads, 400 boxes, 80 and 15 per cent. discount; less quantities than carloads, 80 and 10 per cent. discount. Freight allowed on car lots and over, not to exceed 17½ cents per 100 pounds; less than car lots, f.o.b. at shipping point. French Window Glass, 75 and 10 and 5 per cent. discount. American Plate ranges in price from 50 and 10 and 7½ per cent. discount to 60 and 5 per cent. discount. Imported Plate Glass, 60 per cent. discount to 60 and 10 and 5 per cent. discount.

Old Rubber.—Referring to the following quotations it will be seen that a reduction has been made in the prices paid for some grades of Old Rubber. These are the current prices paid for Old Rubber delivered in New York:

Car Springs, ton lots, ℔ lb.	@	$0.03¼
Rubber Shoes, carloads ℔ lb.	@	.03⅛
Rubber shoes, less than carloads.	@	.03
Large Hose, ℔ ton	@	9.00
White Wringer Rolls, ℔ lb.	@	.04¼
White Syringes, ℔ lb.	@	.05

Old Rags, Paper, Etc.—From the corrected quotations on Old Rags, Paper, &c., it will be noticed that lower prices are named for White and Mixed Rags, on some grades of Paper and on Jute Butts. The following are the current prices paid for Old Rags, Paper, &c., delivered in New York:

No. 1 White Rags	℔ lb	3	@ 3⅛¢
No. 2 White Rags	℔ lb	2	@ 2⅛¢
Mixed Rags	℔ lb		1¼¢
Blues and 3ds	℔ lb		1¼¢
Hard Sized White Shavings	℔ lb		2¾¢
No. 1 White Book Shavings	℔ lb	2¼	@ 2⅜¢
No. 2 White Book Shavings	℔ lb	1½	@ 1¾¢
Light Book Shavings	℔ lb	⅞	@ 1 ¢
No. 1 Mixed Shavings	℔ lb		1¢
No. 2 Mixed Shavings	℔ lb		½¢
No. 1 Printed Books	℔ lb	1	@ 1¼¢
Ordinary Mixed Books	℔ lb	½	@ ¾¢
Newspapers	℔ lb		½¢
No. 1 Manila Paper	℔ lb	1⅛	@ 1¼¢
No. 2 Manila Paper	℔ lb	⅞	@ 1 ¢
Bogus Paper	℔ lb	⅝	@ ¾¢
Common Paper	℔ lb	¾	@ ½¢
Straw Chips	℔ lb	½	@ ⅝¢
Binders' Clippings	℔ lb	½	@ ⅝¢
Jute Butts	℔ lb		1¢
No. 1 Jute Bagging	℔ lb	1¼	@ 1⅜¢
Mixed Bagging	℔ lb		1¢
No. 2 Bagging	℔ lb		¾¢
Hemp Twine	℔ lb		2¼¢
Manilla Rope	℔ lb		2¼¢
Jute Rope	℔ lb	1⅞	@ 2¢
Mixed Rope	℔ lb	¾	@ ⅞¢

Old Metals.—The following are the current prices paid for Old Metals in New York:

Heavy Copper	℔ lb	9½¢
Light and Tinned Copper	℔ lb	8½¢
Heavy Brass	℔ lb	7¢
Light Brass	℔ lb	6¢
Lead	℔ lb	3½¢
Tea Lead	℔ lb	3½¢
Zinc	℔ lb	2¾¢
No. 1 Pewter	℔ lb	14¢
No. 2 Pewter	℔ lb	7¢
Wrought Scrap Iron	℔ gross ton,	$13.00
Heavy Cast Scrap	℔ gross ton,	9.00
Stove Plate Scrap	℔ gross ton,	6.00
Burnt Iron	℔ gross ton,	4.00
Mixed Bagging	℔ lb	1 ¢
No. 2 Bagging	℔ lb	¾¢
Hemp Twine	℔ lb	2½¢
Manila Rope	℔ lb	2¼¢
Jute Rope	℔ lb	1⅞ @ 2 ¢
Mixed Rope	℔ lb	¾ @ ⅞¢

Trade Notes.

The Raven Stove Polish Company of Chicago have a remarkably fine display of their Stove Polish in one of the large windows of Siegel, Cooper & Co.'s department store on the corner of State and Van Buren streets, in the same city. The entire window, 18 feet high, 9 feet long and 8 feet wide, was set aside for this display, which includes graphite from the Sonora mines in Mexico, to show the material from which Raven Stove Polish is made; packages of Lead Pencils made for the United States Graphite Company of Saginaw, Mich., to illustrate the high character of the same graphite; pails of Raven Polish, as put up for manufacturers; boxes of Raven Polish, as put up for the general trade, built in various fanciful forms, and an automatic female figure polishing a stove with Raven Polish. The whole arrangement is exceedingly creditable to those who originated and completed it, attracting

crowds of people daily by its unusual character.

We are indebted to the Nubian Iron Enamel Company of Cragin, Ill., for a copy of a neat desk calendar for the three months of the year ending September 30. In general shape it conforms to the calendars issued by the company for the previous months of the year, and as may be supposed refers at some length to the merits of Bonnell's Nubian.

Myer & Cooney, Indianapolis, Ind., find their specialty, Rain Water Cut-Offs, in great demand. Their line of Tinware embraces a complete variety, and though their facilities for production have been frequently enlarged and improved, they still are taxed to keep orders promptly filled.

The Tanite Company of Stroudsburg, Pa., have just issued circulars relating to a liquid polish which has been prepared to meet the wants of the trade. It is stated that the polishing paste offered by the company is free from injurious ingredients and is intended for the same purposes as are met by the liquid polish, to the employment of which many in the trade are opposed. Accompanying the descriptive circulars which the company have issued relative to this paste is a price-list and discount sheet on polishes manufactured by the Tanite Company.

I. P. Frink of 551 Pearl street, New York, has recently supplied a number of buildings with Reflectors, designed for use in connection with electric lighting and gas illumination. Prominent among these structures may be mentioned the Gallery of Fine Arts, World's Fair, Chicago; the State House at Columbus, Ohio; the Chicago Art Institute, the Convention Hall at Saratoga, and 35 prominent churches in various parts of the country.

The Newton Machine Tool Works, Philadelphia, Pa., issue a handsome catalogue of their Cold Saw Cutting-Off Machines, showing illustrations of the different machines, together with brief description. The publication, likewise, gives a list of testimonial letters.

The Joseph Dixon Crucible Company, Jersey City, N. J., and 68 Reade street, New York, have two exhibits at the fair. One is of Dixon's American Graphite Pencils, in the northeast gallery of the Manufactures Building, and the other, covering all the other articles manufactured by them, in the northeast gallery of the Mines and Mining Building. The Pencil exhibit occupies a space 10 x 14 feet and consists of a low mahogany table surmounted by a pyramid of velvet, covered with Pencils, arranged in graceful and beautiful designs by an artist employed specially for that purpose, over which stands a rosewood and plate-glass case. The exhibit of general and special Graphite products in the Mines and Mining Building occupies a space 25 x 28 feet. Crucibles, Retorts, Ladles, Stopper Heads and Nozzles, Graphite Boxes. Phosphorus Chargers, Resistance Rods and devices, Incandescent Filiment Forms, and other special goods made of Graphite, are shown in upright cabinets. In a case is shown the development of an electrotype plate, in which process the use of Graphite is an essential. In still another case are shown over 50 varieties of Graphite, such as Graphite for lubricating, stove polish, foundry facings for green, dry or loam castings, core wash, ingot mold wash, shot and powder glazing, electrotypers, gilders' use, hatters' use, rubber packings, piano and organ actions, "potleading" yachts, for crucibles, lead pencils, paint pigment, lubricants, &c. There are also shown samples of Graphite from all the principal sources from which that article is obtained. One very fine sample from the Island of Ceylon weighs nearly 300 pounds.

Wisconsin Refrigerator Company, Eau Claire, Wis., advise us that they have been unable to keep up with orders, and are contemplating large improvements in their plant for next season.

Ingersoll Mfg. Company of Lansing, Mich., have brought out a lamp-stove which they term the Magic room heater. It consists of a square metallic table with four legs. The lamp is placed in a frame a short distance from the floor and the heat passes through what is termed the "heat battery" at the top, which is composed of a great number of hot air pipes or ducts. Air currents are drawn through the battery, heated and discharged into the room. It is claimed that the stove will heat a room 16 x 16 feet in cold weather, with the consumption of one gallon of oil in 12 to 15 hours. The size of the stove is 10 x 10 inches and 30 inches high. When not in use as a stove it forms an ornamental table or stand.

F. H. Rice, senior member of the firm of Rice & Miller, hardware merchants of Elkland, Pa., has accepted a position as traveling salesman of the Eureka Range Company, with headquarters at Mansfield. Mr. Miller will continue the business at the old stand.

Matthai, Ingram & Co. of Baltimore, Md., have nearly completed the repairs to their factory buildings rendered necessary by their late fire, and have made some large additions. The fire started in the retinning department and extended to their three story factory building. They are now building a new retinning shop, 40 x 180 feet, which is much larger than the old one. This new building will be absolutely fire proof, it being constructed of brick, with iron girders, roof, window frames and shutters, and there being no wood work whatever about it. The sheet and black goods department will be contained in a new four-story brick building, 70 x 140 feet, and forming an ell to this building is a new four-story building, 40 x 135, to be used as a tinning shop. A galvanizing plant will occupy a building which was formerly located on the site where the retinning shop is being built, but which has been moved to an adjoining lot recently purchased. With these additions and extensions the firm's capacity for production of their goods will be considerably increased in all departments, and they will be enabled to manufacture a line of goods which they have for some time had under contemplation.

Gummey's Anti Pin Hole Bright Tin Plate is the subject of an advertisement elsewhere by Gummey, Spering & Co. of Philadelphia. They describe this plate as the only absolutely anti-pin hole plate ever made. They say that experience proves its success, and that it is guaranteed in full. This will be welcome news to those who have searched for a plate that would not pin hole, which complaint has been so common heretofore and has caused so much trouble and expense in the manufacture of a certain class of goods.

P. J. Conroy & Co. of Paschall, Philadelphia, manufacturers of Refrigerator fittings, have added to their line a Refrigerator and Cooler Faucet, and a Refrigerator Door Fastener, especially suitable for large doors.

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Metal and Miscellaneous Prices.

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CHICAGO, JULY 6, 1893.

Tin—

Straits pigs.....22¢

Imported Tin Plates—

Charcoal Plates.—Bright.

Guaranteed Plates command special prices, according to quality.

		Per box.
Calland and Melyn Grade	IC, 10 x 14	@ $6.75
	IC, 12 x 12	@ 6.75
	IC, 14 x 20	@ 6.75
	IC, 20 x 28	@ 13.50
	IX, 10 x 14	@ 8.75
	IX, 12 x 12	@ 8.75
	IX, 14 x 20	@ 8.75
	IX, 20 x 28	@ 17.50
	DC, 12½ x 17	@ 6.50
	DX, 12½ x 17	@ 8.50
Allaway Grade,	IC, 10 x 14	@ 6.50
"	IC, 12 x 12	@ 6.50
"	IC, 14 x 20	@ 6.50
"	IC, 20 x 28	@ 13.00
"	IX, 14 x 20	@ 8.00
"	IX, 20 x 28	@ 16.00

Coke Plates—Bright.

	Per box.
Steel Coke—IC, 10x14.14x20	@$6.00
IC, 14x20.90 lb	@ 5.75
IC, 14x20, 100 lb	@ 5.85
10 x 20	@ 9.00
20 x 28	@12.00
X, 10x14, 14 x 20	@ 7.50
Grade. IC, 10x14, 14x20	@ 6.00

Charcoal Plates.—Terne.

Guaranteed Plates command special prices, according to quality.

Mansel and Dean Grades.—

IC. 14 x 20 ...@ $5.62½
20 x 28.....@ 11.25
IX. 20 x 28.....@ 14.25

Worcester Brand and equal.—

IC, 14 x 20.. 6.12½@ .....
IC, 20 x 28..12.25 @ .....
IX, 14 x 20.. 7.62½@ .....
20 x 28..15.25 @ .....

American Tin Plates.

Charcoal Plates.—Bright.

Irondale, A. A.—IC, 14 x 20.....$7.00
" " IX, 14 x 20..... 9.00
" " IXX, 14 x 20.....11.00
" " IC, 20 x 28.....14.00
" " IX, 20 x 28.....18.00
" " IXX, 20 x 28.....22 00

Florence.—

IC, 10 x 14, 12 x 12, 14 x 20..$6.75
IX, 10 x 14, 12 x 12, 14 x 20.. 8.75

Palma.—

IC, 10 x 14, 12 x 12, 14 x 20..$7.50
IX, 10 x 14, 12 x 12, 14 x 20.. 9.50

Each extra cross $2.00 and 20 x 28 double these prices.

Brilliant, Tissue Packed, IC, 14 x 20.$9.25
Royal, extra, IC, 14 x 20..... 7.25
Merlon, IC, 14 x 20..... 7.00
Almond, IC, 14 x 20..... 6.50
Mint, IC, 14 x 20..... 6.25

Coke Plates.—Bright.

Elwood.—IC, 14 x 20.....$6.00
" IC, 20 x 28.....12.50

Roofing Plates.

Arch (205 lb), 20 x 28	@$12.00
Palm (205 lb), 20 x 28	@ 12 25
Crescent, IC, 20 x 28	@ 12.50
Crescent, IX, 20 x 28	@ 15.75
Empire, IC, 20 x 28	@12.75
" IX, 20 x 28	@16.00
Hickory, IC, 20 x 28	@ 13.00
" IX, 20 x 28	@ 16.10
Alaska (heavily coated), IC, 20x28	@$14.50
Alaska IX, 20 x 28	@ 17.75
Special, IC, 20 x 28	@ 15.00
" IX, 20 x 28	@ 18.25
Merchant's Roofing (extra coated), IC, 20 x 28	@17.75
Merchant's Roofing (extra coated), IX, 20 x 28	@21.50
Merchant's Old Method, (extra heavily coated), IC, 20 x 28	@19.75
Merchant's Old Method (extra heavily coated), IX, 20 x 28	$23.60
Irondale A:	
IC, 14 x 20	$6.25
IX, 14 x 20.	7.75
IC, 20 x 28	12.50
IX, 20 x 28	15.50
Westmoreland:	
IC, 14 x 20	$6.25
IC, 20 x 28	12.50
Elwood:	
IC, 20 x 28	$12.00
Juno:	
IC, 14 x 20	$5.75
IC, 20 x 28	11.50
Scott's Extra Coated, Stamped and Resquared, IC, 14 x 20	$9.50
Scott's Extra Coated, Stamped and Resquared, IX, 14 x 20	11.00
Scott's Extra Coated, Stamped and Resquared, IC, 20 x 28	19.00
Scott's Extra Coated, Stamped and Resquared, IX, 20 x 28	22.00
Neville, Stamped, IC, 14 x 20	6.25
" " IX, 14 x 20.	7.50
" " IC, 20 x 28	12.50
" " IX, 20 x 28	15.00
Taylor's Old Style, IC, 14 x 20 (Stamped and Resquared)	$9.50
Taylor's Old Style, IC, 20 x 28 (Stamped and Resquared)	19.00
Taylor's Roofing, IC, 14 x 20 (Stamped and Resquared)	8.25
Taylor's Roofing, IC, 20 x 28 (Stamped and Resquared)	16.50
Columbia, IC, 14 x 20 (Stamped)	7.25
" IC, 20 x 28 (Stamped)	14.50
Maple, IC, 14 x 20 (Stamped)	6.75
" IC, 20 x 28 (Stamped)	13.50
Willow, IC, 14 x 20	6.50
" IC, 20 x 28	13.00
Knoxall, IC, 14 x 20	6.25
" IC, 20 x 28	12.50
Globe, IC, 14 x 20	6.00
" IC, 20 x 28	12.00
Miami, IC, 14 x 20	6.00
" IC, 20 x 28	12.00
" IX, 20 x 28	15.00
" (Redipped), IC, 20 x 28	17.00

Tin Boiler Plates.

	Per box of 100 sheets.	Per box of 112 sheets.
X, 14 x 28	$13.00	$13.00
XX, 14 x 28	14.50	14.50
X, 14 x 31	14.50	15.80
XX, 14 x 31	16.50	17.50
X, 14 x 56	20.50	16.50
XX, 14 x 56	32.50	18.20
X, 14 x 60	31.50	17.65
XX, 14 x 60	35.50	20.90

Sheet Iron—

Black.

Nos.	Common American	Refined.
10 to 16	₩ lb 2 7-10¢	3 3-10¢
17 to 20	₩ lb 2 8-10¢	3 4 10¢
21 to 24	₩ lb 2 9-10¢	3½¢
25 and 26	₩ lb 3¢	3 6-10¢
27	₩ lb 3 1-10¢	3 7-10¢

Russia, Planished, &c.

Genuine Russia, all numbers....13¢ net.
Patent Planished....₩ lb A, 10¼¢; B, 9½¢ dis. 5%

Galvanized.

List on following page.
Juniata or first quality.....dis. 70&2½%

Copper—

Ingot.

Lake.....12¢ @ 12½¢
Casting Brands.....11¢ @ 11½¢

Sheet and Bolt.

List on following page. Discount to retailers, 25%.

Copper Bottoms.

List on following page. 25%.

Seamless Brass and Copper Tubes.

Base price, 17½¢, Chicago, with extras according to size.

Copper, Bronze and Gilding Tube, 3¢ ₩ lb additional.

Brazed Brass Tubing.

(To No. 20 inclusive.)

Add freight from New York to Chicago to these prices, or 50¢ ₩ 100 lb.

Above 5-16 inch to 3 inch inclu	35¢
Plain, above 3 inch	45¢
Plain, 5-16 inch	45¢
Plain, ¼ inch	60¢
Plain, 3-16 inch	$1.00
Plain, ⅛ inch	$1.50
Fancy Tubing, Brass, to No. 20 incl	43¢ lb
Bronze Tubing, 3¢ ₩ lb more than Brass.	

35 @ 40 %

Roll and Sheet Brass.

List on following pages. 35 @ 40%.

Slab Spelter—

Western Spelter.....5

Sheet Zinc—

600 lb casks.....6¼¢
Less than Casks, ₩ lb.....6½¢

Lead—

Soft Pig Lead.....4¼¢
Bar.....4.60¢@5¢
Pipe.....5½¢, dis. 10¢
Block Tin Pipe.....35¢
Sheet.....6¢, dis. 10¢

Solder—

½&½.....13¼¢@13¾¢
Extra Wiping.....12¢

The prices of the many other qualities of Solder in the market indicated by private brands vary according to composition.

Antimony—

Cookson.....12¼¢@13¼¢
Hallett's.....11½¢@12¾¢

Wire—See *Hardware.*

Wrought-Iron Pipe—

List on following page.

1¼ and under, Plain.....60&10%
1¼ and under, Galv.....52½&10%
1½ and over, Plain.....70&10%
1½ and over, Galv.....60&10%
Boiler Tubes, list Oct. 24, 1892...65@67½%
Casing, list Nov. 16, 1892.....52½%
Inserted Joints Casing, list Nov. 16, 1892.....47½%
Steel Boiler Tubes.....27½%
Cold Drawn Seamless Steel Tubing...50%

Cast-Iron Soil Pipe—

Cast-Iron Soil-Pipe, Tarred; Sizes 2 to 6 inches, inclusive.....dis 70&2½%
Other sizes.....dis 60%

Leader Pipes—

Abendroth's Galv. Spiral Riveted.....55%
Austin's Corrugated.....60%
Gordon & Gilbert's Corrugated.....55%
Ritchie's (Galv. Iron only) Cor'd.....55%
Ritchie's Spiral Lock Seam, Galv'd.....50%
Austin's Spiral Ribbed Pipe.....55%
Plain Adjustable Elbows.....55%
James A. Miller Bros. (Galv'd Iron only) Corrugated.....55%

Furnace Fittings—

Discount from Excelsior Steel Furnace Co's list.....50%

Steel Roofing—

Perfection.....$3.75 square
Climax.....$3.50 square
The Lloyd Spanish Tiling....$4.50 square

Metallic Shingles—

Cushman's.....$1.25 square
Merchant & Co.'s Spanish Tiles:
Copper, 14 oz.....$36.00 square
Steel, painted.....$9.00 square

Drain Pipe—

Discount from list.....50%

Paints, Oils, &c.—

Deodorized Benzine.....7½@8 ¢
Iron Paint, Bright Red.....₩ lb, 2 ¢
" " Brown.....₩ lb, 1½¢
" " Purple.....₩ lb, 2½¢
" Ground in oil, B. Red ₩ lb, 6½¢
" Ground in oil, Red..₩ lb, 6½¢
" Ground in oil, Brown ₩ lb, 5½¢
" Ground in oil, Purple ₩ lb, 6 ¢
Linseed Oil, Boiled, in bbls.....53¢
Linseed Oil, Raw, in bbls.....50¢
Mineral Paints.....2@4¢
Orange Mineral.....10¾¢
Pure White Lead in Oil.....6¾@7¼¢
Dry White Lead in bbls.....6¼@6¾¢
Red Lead, American.....7@7½¢
Red Venetian, English, dry...$1.65@$1.70
Red Venetian in oil; asst'd cans, 8½¢; kegs.....7½¢
Sipe's Japan Oil, in bbls, ₩ gal..... .34¢
Spirits Turpentine, in bbls., ₩ gal..34½¢
Asphaltum, Trinidad Refined, ₩ ton..$45
Tarred Felt, 1 Ply, ₩ 100 lb.....$1.65
Tarred Felt, 2 Ply, ₩ roll 108 sq. feet.....$1.50
Tarred Felt, 3 Ply, ₩ roll of 108 sq. feet.....$2.00
Roofing Pitch, ₩ bbl. of 300 lb.....$3.20

NEW YORK, JULY 7, 1893.

Aluminum—

No. 2 Grade Metal, in ton lots..₩ lb, $0.75
No 1 (guaranteed to be 98 % pure and over), in ton lots .....₩ lb .90
Lots less than 1 ton, 10¢ ₩ lb additional.

Antimony—

Cookson.....₩ lb, 11½¢
Hallett's.....₩ lb, 10¾@11¢

Brass—

Planished.....net
Roll and Sheet.....35@40%

Brass and Copper Tubes

Brazed Brass Tubing—

List May 20, 1889.

	Per lb.
Plain, to No. 20 inclusive, above 5-16 inch to 3 inch inclusive	$0.35
Plain, to No. 20, above 3 inch	45
Plain, 5-16 inch to No. 20	45
Plain, ¼ inch	60
Plain, 3-16 inch	1.00
Plain, ⅛ inch	1.50
Fancy Tubing to No. 20, inclu	43

36@40%

Copper and Bronze Tubing—

3¢ ₩ lb more than brass.

Bronze, Tobin—

Drawn Rods for Bolts, Forgings, &c

Over ¼ to 3½ inches inclusive....17¢ ₩ lb
Over 3½ to 5 inches inclusive.....18¢ ₩ lb

Piston Rods, Finished True, Smooth and Straight.

Over ¼ to 3½ inches inclusive....18¢ ₩ lb
Over 3½ to 5 inches inclusive.....19¢ ₩ lb

Clips—

Buffalo Damper: Nos. 1, $1.25; 2, $2.50 per doz.....40&10%

Conductors—

Corrugated. *Round or Square—*

Galvanized.....60%
Galvanized, Locked Joints.....60%
Tin.....60%

Spiral Riveted—

Galvanized.....50%

See also *Elbows and Shoes; Eave-Trough Miters; Strainers, Conductor.*

Conductor Strainers—See *Strainers, Conductor.*

Copper—

Bottoms, Pits and Flats.....15@25%

Ingot.

Lake.....12¢
Ansonia Grade Arizona.....11½¢
Ansonia Grade Casting.....11¢
Planished.....net
Sheet and Bolt.....25@30%

Tubes—See *Seamless Brass Tubes.*

Coppers, Soldering—

See *Irons, Soldering*, in Current Hardware Prices.

Damper Clips Buffalo—

See Clips, Buffalo Damper.

Eave Troughs—

Lap or Slip Joint, Galvanized.....60%
Lap or Slip Joint, Terne.....50%

Eave-Trough Mitres—

Lap or Slip Joint.....list, net

Elbows—

Plain Adjustable—

Tin.....70%
Galvanized.....70%

Crimped Tubing—

Re-Tinned or Galvanized.....35%

Stove-Pipe—

Buffalo Four-Piece.

4½	5	5½	6	7 inch,
$0.78	.87	.90	.99	1.20 per doz..20 %

Elbows and Shoes—

Flat Crimp.

Tin.....35%
Galvanized.....35%

Corrugated.
Flat Crimp.

Galvanized.....60%

Round or Square.

Tin.....60%
Galvanized.....60%

Iron, Sheet—

Black.

	Common American.	R. G. Cleaned American.
Nos. 10 to 16	₩ lb, 2¾@....	3¼¢
Nos. 17 to 20	₩ lb, 3 @...	3¼¢
Nos. 21 to 24	₩ lb, 3¼@ ...	3½¢
Nos. 25 and 26	₩ lb, 3⅝@....	3⅝¢
No. 27	₩ lb, 3⅝@....	3¾¢
No. 28	₩ lb, 3⅝@....	3¾¢
American B. B.	₩ lb, 4¢@4½¢	

Russia, Planished, &c.

Genuine Russia, according to assortment.....₩ lb, 12@13¢
Patent Planished....₩ lb, A, 10¢; B, 9¢, 5%
Craig Polished Sheet.....₩ lb, 8½¢

Galvanized.

	B. B.
Nos. 10 to 16	₩ lb, 4¢
Nos. 17 to 22	₩ lb, 4¼¢
Nos. 23 to 24	₩ lb, 4½¢
Nos. 25 to 26	₩ lb, 4¾¢
No. 27	₩ lb, 5¢
No. 28	₩ lb, 5¼¢
Nos. 29 and 30	₩ lb, 6¼¢

Filter Joints—

Lee's.....33⅓ %

Lead—

American Pig.....4¾¢
Bar.....4¾¢

New York Prices.

Pipe.....6¼¢, 20%
Tin Lined Pipe.....15¢, 20%
Block Tin Pipe.....37½¢, 20%
Sheet.....7¢, 20%
Old Lead in exchange, 3¼¢ ₩ lb.

Pittsburgh Prices.

Lead Pipe in whole coils. ₩ lb, .05¢, 10&5%
Sheet Lead in whole coils. ₩ lb, .05½¢, 10&5%

Metal, Expanded—

Manufacturers' list No. 5.

Lathing.....10%
Fencing, Painted Sheets.....20%
Netting, Painted Sheets.....20%
Door Mats, Galvanized.....25%
Window Guards, Paneled.....15%
Tree Guards, Paneled.....15%

Mitres Eave-Trough—See *Eave-Trough Mitres.*

Paints Oils &c.—

Lead, Amn. White, Dry or in oil:
Kegs, lots less than 500 lb.... 7 @ 7¼¢
Kegs, lots 500 lb to 5 tons ... 6¼ @ 6¾¢
Kegs, lots 5 tons to 12 tons... 6⅜ @ 6⅝¢
Kegs, lots 12 tons and over.. 6¼ @ 6½¢
Lead, White, in oil, 25 lb tin pails, add to keg price. ... @ ¼
Lead, White, in oil, 12½ lb tin pails, add to keg price..... ... @ 1
Lead, Red, bbls. and ½ bbls... 6 @ 7
Lead, Red, kegs ... ... 6¼ @ 7¼
Ocher, American ..... ½ @ 1½
Red, Venetian, American ..... ₩ 100 lb..1.00 @ 1.10

Linseed Oil:
City, raw, ₩ gal..... .. @ .50
City, boiled..... .. @ .53
Western, raw..... .. @ .50

Spirits Turpentine:
In regular bbls.....28½ @ . 29
In machine bbls..... .. .... 29 @ .29½

Putty:
In barrels and ½ bbls..... .01¾ @ .01¾
In tubs ..... .01⅝ @ .01¾
In tin cans ..... .01⅝ @ .02¼
In bladders .. . . .01⅞ @ .02¼

Roofing Material, &c.:
Asphaltum, Trinidad Refined, ₩ ton. ....$30.00@$35.00
Asphaltum, Rock, ₩ ton.....$14.00
Coal Tar Felt, 1 Ply, ₩ lb.....2¢
Coal Tar Felt, 2 Ply, ₩ roll 108 sq. ft. $1.42½
Coal Tar Felt, 3 Ply, ₩ roll 108 sq. ft. $1.85
Roofing Pitch, ₩ bbl.....$2.24

Pipe, Drain 50%

Pipe and Fittings, Cast Iron Soil—

Cast-Iron Soil Pipe, Tarred, sizes 2 to 6 Inches, inclusive.....60@60&10%
Other sizes.....55@55&10%
Cast-Iron Fittings, Tarred, sizes 2 to 6 inches ... .60@60&10%
Other sizes.....55@55&10%

Pipe, Spiral—

Galvanized.....60%
Tin.....60%

Pipe, Wrought Iron—

For discounts see Current Hardware Prices.

Polish, Stove—

Raven Liquid:
6 oz. bottles, ₩ gro $8.00
8 oz. bottles, ₩ gro.....$9.00
Water Polish $7.20

Rivets and Burrs—

For discounts see Current Hardware Prices.

Rock and Slag Wool—

	℔	₱ cub. foot.
Slag Wool, ordinary	1¼	19¢
Slag Wool, extra	4¼	38½¢
Rock Wool, ordinary	2¼	27¢
Rock Wool, extra	7¼	43½¢

Rosin—

Common and Good—Strained,
Rosin, C. & D ..... ₱ bbl. $1.25@$1.30
Rosin, E. & F ..... ₱ bbl. $1.35@$1.40
Rosin, G. & H ..... ₱ bbl. $1.55@$1.90
Rosin, I. & K ..... ₱ bbl. $2.50@$3.25
Rosin, M. & N ..... ₱ bbl. $3.00@$3.75

Seamless Brass Tubes..net

Shoes and Elbows—See *Elbows and Shoes.*

Slate Roofing—

According to size, f.o.b. cars, Quarry Station.

Pennsylvania:
Best Bangor, ₱ sqr ..... $3.25@$4.50
Pen Argyle, ₱ sqr ..... 3.50@ 4.25
Peach Bottom, ₱ sqr ..... 5.00@ 6.25
No. 1 Chapman, ₱ sqr ..... 4.00@ 4.65
Lehigh Slates, ₱ sqr ..... 3.00@ 4.50
Vermont:
Sea Green, ₱ sqr ..... 2.70@ 3.20
Purple, ₱ sqr ..... 3.50@ 4.50
Unfading Green, ₱ sqr ..... 3.50@ 4.00
Red, ₱ sqr ..... 9.75@12.00

Solder and Soldering Fluids—

Solder—

½ & ¼ (Guaranteed) ..... 13½@15¢
No. 1 ..... 11¾@12½¢
Prices of Solder indicated by private brands vary according to composition.

Soldering Fluids—

Concentrated Soldering Flux.
f.o.b. New York.
In barrels, ₱ ℔ ..... 4¢
Smaller quantities, ₱ ℔ ..... 5¢

Gedney's Soldering Fluid.
In carboys or barrels, ₱ ℔ ..... 2¢
$1.50 for ea rboy or barrel; money refunded when returned.

Perfection Soldering Flux.
No charge for package.
Bbls., about 500 ℔, ₱ ℔ ..... 3½¢
½ bbls., about 300 ℔, ₱ ℔ ..... 4¢
Kegs, about 110 ℔, ₱ ℔ ..... 4¢
76¢ extra for keg.
Kegs, about 55 ℔, ₱ ℔ ..... 4¢
5 % dis.

Yager's Soldering Salts.
¼-℔ bottles, each ..... 30¢
Large quantities, per ℔ ..... 40¢

Spelter—

Western Spelter ..... 5¢@5¼¢
Bertha ..... 8@8¼¢

Spiral Pipe—See *Pipe, Spiral.*

Stove-Pipe Elbows—See *Elbows. Stove Pipe.*

Stove Polish—See *Polish, Stove.*

Stove Trucks—See *Trucks, Stove.*

Strainers Conductor—

Galvanized 60%

Tin, Pigs and Bars—

Banca, pigs, ₱ ℔ ..... 21¼@22¢
Straits, pigs, ₱ ℔ ..... 21½¢
Straits in bars, ₱ ℔ ..... 22½¢

Tin Plates—

American Terne Plates—

Apollo Roofing.

IC, 14 x 20 ..... $6.25
IC, 20 x 28 ..... 12.50
IX, 14 x 20 ..... 7.25
IX, 20 x 28 ..... 14.50

Buckeye.

IC, 14 x 20 ..... $7.00
IC, 20 x 28 ..... 14.00
IX, 14 x 20 ..... 8.25
IX, 20 x 28 ..... 16.50
IXX, 14 x 20 ..... 9.50
IXX, 20 x 28 ..... 19.00

De Mill's.

First New York, IC, 14 x 20 ..... $5.75
" " " IC, 20 x 28 ..... 11.50
First New Jersey, IC, 14 x 20 ..... 5.75
" " " IC, 20 x 28 ..... 11.50
Manhattan, IC, 14 x 20 ..... 7.25
" IC, 20 x 28 ..... 14.50

Dunlap's.

Double Dipped, IC, 14 x 20 ..... $8.25
" " IC, 20 x 28 ..... 16.50
" " IX, 14 x 20 ..... 9.50
" " IX, 20 x 28 ..... 19.00
Domestic, IC, 20 x 28 ..... 12.00
" IX, 20 x 28 ..... 15.00

Glendale Tin Plate Co.

Optimus, Best Redipped, IC, 14 x 20. $8.25
" " " IC, 20 x 28. 16.50
" " " IX, 14 x 20. 9.75
" " " IX, 20 x 28. 19.50
N. F., Old Style, IC, 14 x 20 ..... 7.50
" " " IC, 20 x 28 ..... 15.00
" " " IX, 14 x 20 ..... 9.00
" " " IX, 20 x 28 ..... 18.00
Bonus, Extra Coated, IC, 14 x 20... 6.75
" " " IX, 14 x 20... 8.25
" " " IC, 20 x 28... 13.50
" " " IX, 20 x 28... 16.50

Hamilton's.

Hamilton's Best Redip'd, IC, 14x20 $9.25
" " " IC, 20x28 18.50
" " " IX, 14x20 10.75
" " " IX, 20x28 21.50
Osceola Hand Coated, IC, 14x20 8.25
" " " IC, 20x28 16.50
" " " IX, 14x20 9.75
" " " IX, 20x28 19.50
Lula Best Charcoal, IC, 20x28 12.50
" " " IX, 20x28 16.00

Laufman's.

Apollo, IC (Resquared), 14 x 20.... $8.12
Apollo, IX (Resquared), 14 x 20.... 9.37
Apollo, IC (Resquared), 20 x 28.... 16.00
Apollo, IX (Resquared), 20 x 28.... 18.50
Apollo, IC (Resquared), 20 x 56.... 16.00
Apollo, IX (Resquared), 20 x 56.... 18.50
Tip Top, IC (Resquared), 14 x 20.... 6.62
Tip Top, IX (Resquared), 14 x 20.... 7.88
Tip Top, IC (Resquared), 20 x 28.... 13.00
Tip Top, IX (Resquared), 20 x 28.... 15.50
Allegheny, IC, 14 x 20 ..... 6.12
Allegheny, IX, 14 x 20 ..... 6.38
Allegheny, IC, 20 x 28 ..... 12.00
Allegheny, IX, 20 x 28 ..... 12.50

Merchant's.—All Stamped

Crescent, IC, 20 x 28 ..... $12.00
Crescent, IC, 14 x 20 ..... 6.00
Hickory, IC, 20 x 28 (Resquared).. 12.75
Hickory, IC, 14 x 20 (Resquared)...6.37½
Empire, IC, 20 x 28 ..... 12.25
Empire, IC, 14 x 20 ..... 6.12½
Alaska, IC, 20 x 28 (Resquared).... 14.00
Alaska, IC, 14 x 20 (Resquared).... 7.00
Merchant's Roofing, IC, 20 x 28 (Resquared) 17.00
Merchant's Roofing, IC, 14 x 20 (Resquared) 8.50
Merchant's Old Method, IC, 20 x 28 Resquared) 19.00
Merchant's Old Method, IC, 14 x 20 (Resquared) 9.50

Pittsburgh Tin-Plate Works.

Kensington:
IC, 14 x 20 ..... $6.75
IC, 20 x 28 ..... 13.50
IX, 14 x 20 ..... 8.00
IX, 20 x 28 ..... 16.00
Westmoreland:
IC, 14 x 20 ..... $6.25
IC, 20 x 28 ..... 12.50
Juno:
IC, 14 x 20 ..... $5.75
IC, 20 x 28 ..... 11.50

Scott's.—All Stamped.

Scott's Extra Coated, IC, 14 x 20 (Resquared) $9.25
Scott's Extra Coated, IX, 14 x 20 (Resquared) 10.75
Scott's Extra Coated, IC, 20 x 28 (Resquared) 18.50
Scott's Extra Coated, IX, 20 x 28 (Resquared) 21.50
Neville, IC, 14 x 20 ..... 6.00
" IX, 14 x 20 ..... 7.25
" IC, 20 x 28 ..... 12.00
" IX, 20 x 28 ..... 14.00

N. & G. Taylor Co.'s.

Taylor, Old Style, IC, 14 x 20 (Stamped and Resquared) $9.25
Taylor Old Style, IC, 20 x 28 (Stamped and Resquared) 18.50
Taylor Roofing, IC, 14 x 20 (Stamped and Resquared) 8.00
Taylor Roofing, IC, 20 x 28 (Stamped and Resquared) 16.00
Columbia, IC, 14 x 20 (Stamped)... 7.00
Columbia, IC, 20 x 28 (Stamped)... 14.00
Maple, IC, 14 x 20 (Stamped)..... 6.50
Maple, IC, 20 x 28 (Stamped)..... 13.00
Willow, IC, 14 x 20 ..... 6.25
Willow, IC, 20 x 28 ..... 12.50
Knoxall, IC, 14 x 20 ..... 6.00
" IC, 20 x 28 ..... 12.00
Globe, IC, 14 x 20 ..... 5.75
Globe, IC, 20 x 28 ..... 11.50

A. A. Thompson & Co.'s.

Old Colony, IC, 14 x 20 ..... $8.00
" IC, 20 x 28 ..... 16.00
Thompson's Puritan, IC, 14 x 20.....5.75
" IC, 20 x 28....11.50
Durham, IC, 14 x 20 ..... 5.75
" IC, 20 x 28 ..... 11.50
Central, IC, 14 x 20 ..... 5.45
" IC, 20 x 28 ..... 10.75
" WC, 14 x 20 ..... 5.25
" WC, 20 x 28 ..... 10.25
Tarn, IC, 20 x 28 ..... 10.50

U. S. Brands.—All Stamped.

U. S. Monongahela, IC, 14 x 20.....$6.50
U. S. Redipped, IC, 14 x 20..... 9.25
20 x 28 double the price of 14 x 20

American Bright Plates—

Merchant's.

Merchant's Dipped, IC, 14x20.....$11.00
Palmia Xtra, IC, 14x20..... 7.25
Florence, IC, 14x20..... 6.75

N. & G. Taylor Co.'s.

Brilliant, Tissue Packed, IC, 14x20..$9.00
Royal, extra, IC, 14x20..... 7.00
Merlon, IC, 14x20..... 6.75
Linden, IC, 14x20..... 6.50
Almond, IC, 14x20..... 6.25
Mint, IC, 14x20..... 6.00

U. S.

IC, 14x20..... $7.25
IC, 20x28..... 14.50

Imported Terne Plates—

Charcoal.

Dean Grade.—IC, 14 x 20.....@$5.65
20 x 28.....₱11.00
IX, 14 x 20.....@ 6.40
20 x 28.....@12.80
Abercarne Grade.—IC, 14 x 20.....@ 5.55
20 x 28.....@10.80
IX, 14 x 20.....@ 6.40
20 x 28.....@12.80

Imported Bright Plates—

Charcoal.
Duty: 2.2¢ ₱ ℔.
Melyn and Caland Grade. IC, 10 x 14.....@$6.50
" " IC, 12 x 12.....@ 6.75
" " IC, 14 x 20.....@ 6.50
" " IC, 20 x 28.....@13.00
" " IX, 10 x 14.....@ 8.50
" " IX, 12 x 12.....@ 8.75
" " IX, 14 x 20.....@ 8.50
" " IX, 20 x 28.....@17.00
" " DC, 12½ x 17.....@ 6.00
" " DX, 12½ x 17.....@ 8.00
Allaway Grade. IC, 10 x 14.....@ 6.00
" " IC, 12 x 12.....@ 6.25
" " IC, 14 x 20.....@ 6.00
" " IC, 20 x 28.....@12.00
" " IX, 10 x 14.....@ 7.50
" " IX, 12 x 12.....@ 7.75
" " IX, 14 x 20.....@ 7.50
" " IX, 20 x 28.....@15.00
" " DC, 12½ x 17.....@ 5.50
" " DX, 12½ x 17.....@ 7.00

Coke.

Steel Coke.—IC, 10x14, 14x20.$5.40@$5.50
10x20.....@ 8.50
20x28.11.50@12.00
IX, 10x14, 14x20.....@ 7.00
B. V. Grade.—IC, 10x14, 14x20....@ 5.60

Imported Boiler Plates.—

IXX, 14x26..(112 sheets)..... ..@$13.85
IXX, 14x28..(112 sheets)..... ..@ 14.50
IXX, 14x31..(112 sheets)..... ..@ 16.00

Tinning—

Brass and Copper.....net

Tubing—

Tin 55%
Galvanized 55%

Troughs, Eave—See *Eave Troughs.*

Trucks Stove—

Improved Lock Frame, per doz....$15.00
Steel Lock Frame, per doz..... 18.00

Iron Wire—

See *Hardware Prices.*

Brass and Copper.—

Standard List ..... 30@35%

Zinc—

600 ℔ casks ..... 6½¢
Per ℔ ..... 7¢

Price-Lists, Circulars, &c.

NEW JERSEY LAMP & BRONZE WORKS, New Brunswick, N. J., and 91 Duane street, New York: Lamps, Stove Figures, Urns, &c. Two handsomely illustrated catalogues are devoted to these goods, of which there are a large number of designs, many of them in colors. A specialty is made of Clock Figures, of which there are a large number shown. The catalogues are artistic in design and arrangement, and indicate time and labor spent in compiling them.

OIL WELL SUPPLY COMPANY, Pittsburgh and Oil City, Pa. and New York: Artesian Well Supplies. This their second edition contains 374 pages, while their first catalogue had but 160 pages. It illustrates a large line of goods related to the industry, including prices and descriptions. The manufacturers state that they have ten separate, fully equipped manufactories, in which nearly 3000 people are employed, so that they can themselves make anything required to equip, drill and operate Artesian Wells for Oil, Gas, Water or Minerals. The catalogue is comprehensive, well printed, and substantially bound in cloth.

STUDEBAKER BROS. MFG. COMPANY, South Bend, Ind.: Studebaker Souvenir. The book is handsomely illustrated, showing Vehicles in colors, also views of the interior and exterior of their works. It is bound in cream colored paper, with gold letters. The work will be interesting to those handling this line of goods.

MILLER LOCK COMPANY, Frankford, Philadelphia, Pa.: The Jackson Lock Cylinder. The catalogue illustrates the application of the Cylinder to a variety of Locks, including Rim and Mortise Latches, Front and Vestibule Door Sets, Safe Deposit Locks, Post Office Lock Boxes, Cabinet, Drawer, Cupboard and Chest Locks, &c. The manufacturers claim the Lock to be non-pickable.

KOHLER, HAYSSEN & STEHN MFG. COMPANY, Sheboygan, Wis.: Illustrated catalogue of Flint Enameled Stamped Steel Ware, Cast Iron Enameled Stove Ware, Reservoirs, Maslin Kettles, Cuspidors. Sinks, Drip Trays, Enameled Iron Bathtubs, Evaporating Dishes, Caldrons for Chemical uses, and Lawn Vases and Settees. The catalogue comprises 46 pages, containing full price-lists as well as descriptive matter relating to the various goods.

It Is Reported—

That J. W. Estabrook recently purchased the Hardware stock of A. C. Weeks, Marlboro, Mass.

That Stuhr Hardware Company's store at Minden, Iowa, was destroyed by fire on the 22d ult.

That Erickson Bros., Hardware dealers, Watson, Minn., have been succeeded by G. A Anderson.

That Stearns Bros., dealers in Hardware and Implements, New Richland, Minn., have been succeeded by Stearns & Sorgen.

That Prescott, Mars & Co., dealers in Hardware, &c., Virginia, Minn., were burned out recently. Loss, $15,000; insurance, $7,600.

That Robert Barry has bought the Stove and Tinware business formerly conducted by F. D. Draper, Norwood, Mass.

That A. M. Bryant, Hardware dealer, Buckley, Wash., has sold out his business.

That J. A. Bunnell, dealer in Hardware, Implements, &c., Clyman, Wis., has sold out to John T. Collins.

The growth of European armies in the last 23 years is strikingly set forth in the following table of comparison of the armies of Europe on a war footing, in 1869 and in 1892, recently furnished to the New York *Herald* by its Paris correspondent:

	1869.	1892.
France	1,350,000	4,350,000
Germany	1,300,000	5,000,000
Russia	1,100,000	4,000,000
Austria	750,000	1,900,000
Italy	750,000	2,236,000
England	450,000	602,000
Spain	450,000	800,000
Turkey	320,000	1,150,000
Switzerland	150,000	489,000
Belgium	95,000	258,000
Portugal	70,000	154,000
Holland	45,000	185,000
Denmark	45,000	91,000
Montenegro	40,000	55,000
Greece	35,000	180,000
Roumania	38,000	280,000
Servia	25,000	180,000
Totals	6,958,000	22,248,000

It will thus be seen that the numbers have more than tripled since the time of the Franco-German war.

Current Hardware Prices.

JULY 7, 1893.

Note.—The quotations given below represent the Current Hardware Prices which prevail in the market at large. They are not given as manufacturers' prices, and manufacturers should not be held responsible for them. In cases where goods are quoted at lower figures than the manufacturers name, it is not stated that the manufacturers are selling at the prices quoted, but simply that the goods are being sold, perhaps by the manufacturers, perhaps by the jobbers at the figures named.

The character @ is used to indicate a range of price; thus discount 50&10@50&10&5 % signifies that the goods in question are sold at prices ranging from discount 50 and 10 % to discount 50 and 10 and 5 %.

Adjusters, Blind—

Domestic.....₩ doz $3.00, 33⅓%
Excelsior....₩ doz $10.00.....50&10&2%
North's.....list net @ 10%
Zimmerman's—See Fasteners Blind.

Ammunition—See *Caps, Cartridges, Shells, &c.*

Anvils—

Eagle Anvils, ₩ ℔ 9¢.....15@15&5%
Peter Wright's.....11@11½%
Armitage's Mouse Hole.....10½@11¢
Am. Wrought, Horse shoe brand.11@11½¢
Trenton.....10@10½¢
Wilkinson's.....10½@11¢
Moore & Barnes Mfg. Co.....33⅓%

Anvil Vise and Drill—

Millers Falls Co., $18.00.....20%
Cheney Anvil and Vise.....25%
Allen Anvil and Vise $3.00.....40&10%
Star.....45&5%

Apple Parers—See *Parers, Apple, &c.*

Augers and Bits—

Common Augers and Bits.....70@70&10%
Boring Machine Augers.....70@70&10%
Car Bits, 12-in. twist.....50%
Russell Jennings' Augers and Bits.25&10%
Jennings' Pattern Car Bits.....40%
Jennings' Pattern Auger Bits.....60%
Snell's Bits.....60&5%
C. E. Jennings & Co., No. 10, extension lip.....40%
C. E. Jennings & Co., No. 30.....60%
C. E Jennings & Co., Auger Bits, ₩ set, 32¼ quarters, No. 5, $5; No. 30, $3.50.25%
Lewis' Patent Single twist.....45%
Pugh's Black.....20%
Pugh's Jennings Pattern.....30%
L'Hommedieu Car Bits.....15&10%
Forstner Pat. Auger Bits.....15%
Cincinnati Bell-Hangers' Bits.....30&10

Bit Stock Drills—

Morse Twist Drills.....50&10&5%
Standard.....50&10&5%
Cleveland.....50&10&5%
Syracuse, for metal.....50&10%
Syracuse, for wood (wood list).30@30&5%
Cincinnati, for wood.....30&10%
Cincinnati, for metal.....45&10%

Expansive Bits—

Clark's small, $18; large, $26..35@35&10%
Ives' No. 4, ₩ doz. $60.....40%
Swan's.....40%
Steer's, No. 1, $26; No. 2, $18.....35@40%
Stearns' No. 2, $48.....20%

Gimlet Bits—

Common.....₩ gross $2.75@$3.25
Diamond.....₩ doz $1.25....40&10%
Bee.....25@25&5%
Double Cut, Shepardson's....45@45&10%
Double Cut, Ct. Valley Mfg. Co....30&10%
Double Cut, Hartwell's, ₩ gro., $5.00..25%
Double Cut, Douglass'.....40&10%
Double Cut, Ives.....60@60&10%

Hollow Augers—

Ives', French, Swift & Co. (Beecher), Douglass' } 33⅓@33⅓ & 10%
Bonney's Adjustable, ₩ doz $48.....50%
Stearns'.....20&10%
Ives' Expansive, each $4.50.....50&5%
Universal Expansive, each $4.50.....20%
Wood's.....25@25&10%
Cincinnati Adjustable.....25&10%
Cincinnati Standard.....25&10%

Ship Augers and Bits—

L'Hommedieu's.....15&10@15&10&5%
Watrous'.....25@25&10%
Snell's.....25@25&10%
Snell's Ship Auger Patt'n Car Bits, 15&10@15&10&5%

Awl Hafts—See *Hafts, Awl.*

Awls—

Awls, Sewing, Common....₩ gr. 85¢@90¢
Awls, Should. Peg.....₩ gr. $1.50@$1.55
Awls, Pat. Peg.....₩ gr. 35¢@38¢
Awls, Shouldered Brad..₩ gr. $1.30@ 1.40
Awls, Handled Brad....₩ gr. $2.50@$3.00
Awls, Handled Scratch..₩ gr. $4.00@4.50
Awls, Socket Scratch..₩ doz. $1.10@$1.20

Awl and Tool Sets—See *Sets, Awl and Tool.*

Axes—

	Plain.	Beveled.
First quality, best brands	$7.00	$7.50
First qual., other brands	6.50 to 6.75	7.00
Second quality	5.50	6.00

Axle Grease—See *Grease, Axle.*

Axles—

No. 1....3¼¢@4¼¢, No. 2, 5¢@6¢
Nos. 7 to 14.....60&10%
Nos. 15 to 18.....47½% } 3% cash
Nos. 19 to 22.....70%
Concord Axles, loose collar.....4½¢@6¢
Concord Axles, solid collar.....5½¢@7¢
National Tubular Self Oiling.....33⅓%@33⅓&5%

Bag Holders—See *Holders, Bag.*

Balances—

Spring Balances.....40%
No. 2000 20 30
Chatillon, ₩ doz.. $0.80 0.95 1.75 net
Chatillon Straight Balances.....40%
Chatillon Circular Balances.....50&10%

Barb Wire.—See *Wire, Barb.*

Bars—

Crow—

Cast Steel.....₩ ℔ 3½¢
Iron, Steel Points.....₩ ℔ 3¢

Basins, Wash—

Standard Fiberware, No. 1, 10½-in., $1.80; 12-inch, $2.00; 13½-inch, $2.50; 15-inch, $3.00.

Beams, Scale—

Scale Beams, List Jan. 12, '82..50&10@50&10&5%
Chatillon's No. 1.....40%
Chatillon's No. 2.....50%
Custer's.....33⅓%

Beaters—

Egg—

Dover.....₩ doz $1.00@$1.20
Duplex (Standard Co.).....₩ doz $1.00
Dover (Standard Co.).....₩ doz $1.00
Duplex Extra Heavy (Standard Co.)...₩ doz. $3.50
Bryant's.....₩ gross $14.00
Double (H. & R. Mfg. Co.), ₩ gro., No. 0 $12.00; No. 1, $15.00; No. 2.....$36.00
Easy (H. & R. Mfg. Co.).....₩ gro $12.00
Triple (H. & R. Mfg. Co.).....₩ gro $16.50
Spiral.....₩ gro $4.25 @ $4.50
Improved Acme (H. & R. Mfg. Co.)....₩ gro. $9.00
Silver & Co.....₩ doz $5.50

Culinary—

Keystone, P. D. & Co., Each, No. 1, $1; No. 2, $2.....20%

Bells—

Cow—

Common Wrought.....60&10%
Western, Sargent's list.....70&10%
Kentucky, "Star".....20&10%
Kentucky, Sargent's list.....70&10%
Kentucky Durham.....70&10%
Dodge, Genuine Kentucky....70@70&10%
Texas Star.....50&10@50&10&5%

Door—

Gong, Abbe's.....33⅓&10%
Gong, Yankee.....45&10%
Gong, Barton's.....40&10@50%
Crank, Brooks'.....50&10&2%
Crank, Cone's.....10%
Crank, Connel's.....20&10%
Lever, Sargent's.....60&10%
Lever, Taylor's Bronzed or Plated....net
Lever, Taylor's Japanned.....25&10%
Lever, R. & E. Mfg. Co.'s.....50&10&2%
Pull, Brook's.....50&10&2%

Electric—

Wollensak's.....20%
Bigelow & Dowse.....20%

Hand—

Light Brass.....70&10@70&10&5%
Extra Heavy.....70%
White.....70%
Silver Chime.....33⅓&10%
Globe Cone's Patent).....25&10@35%

Miscellaneous—

Call.....45@50%
Farm Bells.....₩ ℔ 3¢&3½¢
Steel Alloy Church and School Bells..40%

Bellows—

Blacksmiths'.....60&10&5@60&10&10%
Molders'.....40&10@50%
Hand Bellows.....40&10@50%

Belting, Rubber—

Common Standard.....75@75&10%
Standard.....70&5@70&10%
Extra.....60&10@60&10&10%
N.Y.B.&P. Co., Carbon.....60@60&5%
N.Y.B.&P.Co., Diamond.....50@50&5%
N.Y.B.&P.Co., Para.....40@40&5%

Bench Stops—See *Stops, Bench*

Benders and Upsetters, Tire—

Stoddard's Lightning Tire Upsetters..15%
Detroit Perfected Tire Bender.....15%
Green River Tire Benders and Upsetters.....20%

Bits—

Auger, Gimlet, Bit Stock Drills, &c., see *Augers and Bits.*

Bit Holders—See *Holders.*

Blind Adjusters—See *Adjusters, Blind.*

Blind Fasteners—See *Fasteners, Blind.*

Blind Staples—See *Staples, Blind.*

Blocks—

Cleveland Block Co., Mal. Iron.50@50&10%
Moore's Novelty, Mal. Iron.....50%
Sure Grip Steel Tackle Blocks.....25%
See also *Machines, Hoisting.*

Bolts—

Carriage, Machine, &c.—

Com. list June 10, '84.....75&10&5@80%
Genuine Eagle, Norway, list Oct. '84....80&5@80&10%
Eagle, Norway, list Oct. '84 80&10@80&10
Phila. pattern, list Oct. 7, '84..... 80%
R.B.&W., old list.....70%
Machine, list Jan. 1, 1890.....80&10%
Bolt Ends, list Jan. 1, 1890.....80&10%

Door and Shutter—

Cast Iron Barrel, Square, &c.....70&10%
Cast Iron Shutter Bolts.....70&10%
Cast Iron Chain (Sargent's list)....65&10%
Ives' Patent Door Bolts..60&10@60&10&5%
Wrought Barrel.....70&10@75%
Wrought Square.....70&10@75%
Wr't Shutter, all Iron, Stanley's.....60&10@60&10&10%
Wr't Shutter, Brass Knob.....60@60&5%
Wr't Shutter, Sargent's list.....60&10%
Wr't Sunk Flush, Sargent's list....60&10%
Wr't Sunk Flush, Stanley's list.50&10&5%
Wr't B. K.Flush, Common.....55&10%

Stove and Plow—

Stove.....60&10@60&10&5%
Plow.....60&10&50@60&10&10%
R. B. & W., Plow.....55%

Tire—

Common, list Feb. 28, '83.....65@65&5%
Port Chester Bolt and Nut Company:
Empire list Feb. 28, '83.....65%
Keystone, Philadel., list Oct. '84.....80%
Norway, Phila., list Oct. '84.....75%
American Screw Company'
Norway, Phila., list Oct. 16, '84.....75%
Eagle, Phila., list Oct. 16, '84.....80%
Philadel., list Oct. 16, '84.....80%
Bay State, list Feb. 28, '83.....65%
R. B. & W., Philadel., list Oct. 16, '84...80%

Borers, Tap—

Common and Ring.....20&10%
Ives' Tap Borers.....33⅓&5%
Enterprise Mfg. Co.....20%
Clark's.....33⅓@35%

Borax—

Per ℔.....9½@10½¢

Boring Machines—See *Machines, Boring.*

Bow Pins—See *Pins, Bow.*

Boxes, Wagon—

Per ℔.....2¾¢

Boxes, Miter.

Spiker's Excelsior, 3 in. $7.50, 4 in $8 50, 5 in. $13.00, 6 in. $15.00.....20%

Braces—

American Bit Brace and Tool Co.,
Nos. 10, 12, 20.....60&10%
Nos. 11, 21, 24, 27.....70&10%
Nos. 22, 23, 25.....60&10&5%
Nos. 13, 26, 36, 37.....70&10&5
Amidon's,
Barker's Imp'd Plain.....75&10@80%
Barker's Imp. Nickeled.....65&10@70%
Ratchet.....75&10@80%
Eclipse Ratchet.....60%
Globe Jawed.....40@40&10%
Corner Brace.....40@40&10%
Universal, 8 in., $2.10; 10 in.....$2.25
Buffalo Ball.....$1.10@$1.15
Barber s.....50&10%
Saxton's,
Barker's Imp. Polished.....75&10@80%
Barker's Imp. Nickeled.....65&10@70%
Ratchet, Polished.....50&10@60%
Ratchet, Nickeled.....40&10@50%
Buffalo Ball.....net, $1.10@$1.15
Barthoiomew s,
Nos. 25, 27 and 30.....50&10@60&5%
Nos. 117, 118, 119.....70@70&5%
Common Ball, American.....$1.00@$1.10
Fray's Genuine Spofford's...50&5@50&10%
Fray's Nos. 70 to 120, 81 to 123, 207 to 414 50&10%
Ives' New Haven Novelty.....70@70&5%
New Haven Ratchet.....60&5@60&10%
Barber Ratchet.....60&5@60&10%
Barber's.....60&5%
Spofford.....60&5@60&10%
P. S. & W. Co., Peck's Patent.....60%
Rose & Johnson.....50%
Davis Patent.....50&10%

Brackets—

Shelf, plain,
Regular, list.....65@70%
Sargent's list.....60&10@70&10%
Shelf, fancy,
Sargent's list.....70@70&10%
Other makes at a wide range of prices.
Bradley Shelf Brackets.....70&10%

Bright Wire Goods—See *Wire.*

Broilers—

Henis' Self-Basting.	Inch.....	9	10	9x11
	Per doz...$4.50		5.50	6.50

New Haven.....50%
Wire Goods Co.....65&10%
Morgan Odoriess.....₩ doz. $12, 50%
Queen City.....33⅓%

Buckets, Well—Galvanized—

Hill's.....₩ doz. 12 qt. $4.25; 14 qt. $5.25
Iron Clad.....₩ doz. 14 qt. $4.25@4.50
Helwig's Flat Iron Band.....$3.75
Helwig's Wired Top.....₩ doz $4.00

Bull Rings—See *Rings, Bull.*

Butcher's Cleavers—See *Cleavers Butcher s.*

Brass—

Wrought Brass.....80@80&10%
Cast Brass, Tiebout's.....50%
Cast Brass, Fast.....33⅓&10%
Cast Brass, Loose Joint.....33⅓&10%

Cast Iron—

Fast Joint, Narrow.....50&10&5@60%
Fast Joint, Broad.....50&10@60%
Loose Joint, Loose Joint, Japanned, Loose Joint, Jap. with Acorns.., Parliament Butts, Mayer's Hinges, Loose Pin, Acorns, Loose Pin, Acorns, Japanned..., Loose Pin, Acorns, Japanned, Plated Tips..... } 75@75 &10%

Wrought Steel—

Fast Joint, Narrow, Fast Joint, Lt. Narrow, Fast Joint, Broad, Loose Joint, Broad, Table Butts, Back Flaps, &c., Inside Blind, Regular, Indide Blind, Light, Loose Pin..... } List Jan. 2 1893. 60@40&10%
Bronzed Wrought Butts.....50@50&10%

Calipers—See *Compasses.*

Calks, Toe—

Gautier, One Prong, Blunt.....5½@6%
Burke's One Prong, Blunt.....5½@6%
Burke's, Two Prong, Blunt.....7½@8%
Burke's, One Prong, Sharp.....6½@7%

Can Openers—See *Openers, Can.*

Cans, Milk—

S. S. & Co.: 5-gal., $3.00; 8-gal., $4 40; 10-gal., $4.75 each.....40&10%

Caps—

Percussion—

Hicks & Goldmark's and Union Metallic Cartridge Co. ₩ 1000
F. L. Waterproof, 1-10's.....35@37¢
E. B. Trimmed Edge, 1-10's.....47@50¢
E. B. Grnd. Edge, Cent. Fire, 1-10's.....47@50¢
Musket. Waterproof, 1-10's.....50@53¢
G. D.....27@30¢
S. B. Genuine Imported.....45¢
Eley's E. B.....56@58¢
Eley's D Waterproof, Central Fire..$1.00

Primers—

Berdan Primers, $1.00.....2%
B. L. Caps (Sturtevant Shells) $1.00....2%
All other Primers, $1.20.....2%

Cards—

Watson's Cotton, Wool, Horse and File, list January 28, 1891.....25%

Carpet Stretchers—See *Stretchers, Carpet.*

Cartridges—

Rim Fire Cartridges.....50&5&3%
Rim Fire Military.....15&3%
Cent. Fire, Pistol and Rifle.....25&5&3%
Cent. Fire, Military and Sporting 15&5&3%
Blank Cartridges, except 22 and 32 cal., additional 10% to above discounts.
Blank Cartridges, 22 cal., $1.75.....3%
Blank Cartridges, 32 cal., $3.50.....3%
Primed Shells and Bullets.....15&5&2%
B. B. Caps, Round Ball, $1.75.....2%
B. B. Caps, Con. Ball, Swgd., $2.00.....2%

Carpet Sweepers—See *Sweepers, Carpet.*

Casters—

Bed, Plate, Shallow Socket... } Brass.....55@55&10% Others....60@60&10%
Deep Socket.....40&10%
Martin's Patent (Phoenix).45&10@50&10%
Tucker's Patent, low list.....45%
Payson's Anti-friction.....70@70&10%
Payson's Truck.....60@60&10%
Yale Casters, low list.....45%
Yale, Gem.....70%
Giant Truck Casters.....85%
Stationary Truck Casters.....50&10%
Socket Truck Casters.....50@50&10%
Gwinner's Common Sense.....45%
Gwinner's Hercules.....45%

Cattle Leaders—See *Leaders, Cattle.*

Cement—

Victor Elastic.....5 ℔ pails ₩ ℔ 5¢

Chain—

Trace, Wagon and Fancy Chains, List revised May, 1893.....60@60&10%
American Coil, in cask lots,

3/16	¼	5-16	⅜	7-16	½	⅝	¾
$7.60	5.30	4.45	3.80	3.65	3.50	3.40	3.25

Less than cask lots, add ½¢@½¢ ₩ ℔
German Coil, list July 12, 1892 60@60&10%
German Halter Chain, list July 12, 1892. 60@60&10%
Covert Halter.....60&2%
Cover Traces.....35&2%
Cover Wheel Chain.....50&2%
Galvanized Pump Chain.
5 ton lots.....₩ 100 ℔ $5.50
1-ton lots.....₩ 100 ℔ $5.75
500-℔ lots.....₩ 100 ℔ $6.75
Less than 500 ℔.....₩ 100 ℔ $7.00
Oneida Halter Chain.....60@60&5%
Jack Chain, Iron and Brass, list March 10, 1893.....60@60&10%
Barnes' Reinforced Sash.....60&10%
Barnes' Victor Sash.....65%

Chalk—

White, case lots, ₩ gr 50¢; small lots.62½
Red, case lots....₩ gr 67¢ small lots.75¢
Blue, case lots....₩ gr 75¢; small lots 90¢
See also Crayons

Chalk Lines—See *Lines.*

Checks, Door—
Unity 50%

Chisels—
Socket Framing and Firmer
P. S. & W ..... 75&10@75&10&10%
New Haven ..... 75&10@75&10&10%
Witherby ..... 75&10@75&10&10%
Mix ..... 75&10@75&10&10%
Ohio Tool Co. ..... 75&10@75&10&10%
Douglass ..... 75@75&5%
Buck Bros. 30%
Merrill ..... 60&10@60&10&5%
L. & I. J. White ..... 30@30&5%

Tanged and Miscellaneous.
Tanged Firmers ..... 50@50&10%
Butchers' ..... $4.75@$5.00
Spear & Jackson s ..... $5 to £
Buck Bros. 30%
Cold Chisels, ₱ ℔ ..... 15@16¢

Chucks—
Beach Pat ..... each, $8.00 ..... 20%
Morse's Adjustable, each, $7.00, 20@20&5%
Danbury ..... each, $6.00, 30@30&5%
Syracuse, Balz Pat. 25%
Graham Patent 33⅓%
Skinner's Patent Chucks.
Combination Lathe Chucks 33⅓%
Universal Lathe Chucks 40%
Independent Lathe Chucks 40%
Drill Chucks 15%
Union Mfg. Co.
Victor $8.50, 25%
Combination 40%
Universal 40%
Independent 40%

Churns—
Tinin Union, each, 5 gal. $3.25; 7 gal., $3.75; 10 gal., $4.25.
McDermaid Star Barrel Churn, each 6 gal., $2.60; 10 gal., $2.75; 15 gal., $3.00; 20 gal., $3.25.

Clamps—
E. T. Tool Co.'s Wrought Iron 25%
Adjustable, Cincinnati ..... 15&10%
Adjustable, Hammers ..... 15@15&5%
Adjustable, Stearn's ..... 30@30&10%
Stearn's Adjustable Cabinet and Corner ..... 30@30&10%
Cabinet, Sargent's ..... 70&10%
Carriage Makers', Sargent's .. 75@75&5%
Carriage Makers', P., S. & W Co .. 40&10%
Eberhard Mfg. Co. ..... 40&5@40&10%
Warner's ..... 40&10@40&10&5%
Saw Clamps, see Vises, Saw Filers'.
Carpenter's, Cincinnati ..... 25&10%
Barnes' Machinists' Clamps. ..... 33⅓&%

Cleavers, Butchers'—
Bradley s ..... 25@30%
L. & I. J. White ..... 20&5%
Beatty's ..... 40@40&5%
New Haven Edge Tool Co.'s 40%
P., S. & W ..... 33⅓&5@33⅓&10%
Foster Bros. 30%
Schulte, Lohoff & Co ..... 40@40&5%

Clips—
Norway, Axle, ¼ & 5-16 ..... 55&5&5%
2d grade Norway Axle, ¼ & 5-16 .. 65&5%
Superior Axle Clips ..... 66⅔&5@70%
Norway Spring Bar Clips, 5-16 .. 60&5&5%
Wrought Iron Felloe Clips ..... ₱ ℔, 5½¢
Steel Felloe Clips ..... ₱ ℔, 5¢
Baker Axle Clips 25%

Cloth and Netting, Wire —See *Wire, &c.*

Cockeyes 50%

Cocks Brass—
Hardware list ..... 60&2%

Coffee Mills—See *Mills, Coffee.*

Collars, Dog—
Chapman Mfg. Company, new list .. 40%
Medford Fancy Goods Co .. 40&10@50%
Embossed, Gilt, Pope & Steven's list, 30&10%
Leather, Pope & Steven's list 40%
Brass, Pope & Steven's list 40%

Combs, Curry—
Fitch's ..... 50&10@50&10&10%
Rubber, per doz., $10.00 ..... 25%
American Curry Comb Co. .... 33⅓&@40%
Kohler's Magic Oscillating. ₱ doz., $2.00
Kohler's Humane ..... ₱ doz., $1.75

Compasses, Dividers, &c.
Compasses, Calipers, Dividers. 70@70&10%
Bemis & Call Co.'s
Dividers 65%
Compasses ..... 50&5%
Calipers, Inside or Outside 65%
Calipers, Wing 60%
Calipers, Double 65%
Calipers, Call's Patent Inside 55%
Excelsior 50%
J. Stevens & Co.'s ..... 25&10%
Starrett's
Spring Calipers and Dividers .. 25&10%
Lock Calipers and Dividers 25%
Combination Dividers 25%

Coolers, Water—
G. S. & Co.: 2-gal., $2 00; 3-gal., $2.50; 4-gal., $2.75; 6-gal., $3.40 each .. 33⅓&%

Coopers' Tools— See *Tools, Coopers'.*

Cord—
Sash—
Common ..... ₱ ℔, 9@10¢
Patent, good quality ..... ₱ ℔, 11@12¢
White Cotton Braided, fair .. ₱ ℔, 24@25¢
Common Russia Sash ..... ₱ ℔, 12½@13¢
Patent Russia Sash ..... ₱ ℔, 13½@ 14¢
Cable Laid Italian Sash ..... ₱ ℔, 19@20¢
India Cable Laid Sash ..... ₱ ℔, 11½@12¢
Silver Lake—
A quality, White, 50¢ 25%
A quality, Drab, 55¢ 25%
B quality, White, 30¢ 10%
B quality Drab, 35¢ 10%
Sylvan Spring, Extra Braided, White. 34¢
Sylvan Spring, Extra Braided, Drab. .39¢
Semper Idem, Braided, White .. 27@28¢
Egyptian, India Hemp, Braided ..... 26¢
Massachusetts, White ..... 29¢
Samson—
Braided, White Cotton ..... ₱ ℔, 37¢
Braided, Drab Cotton ..... ₱ ℔, 42¢
Braided, Italian Hemp ..... ₱ ℔, 40¢
Braided, Linen ..... ₱ ℔, 56¢
Cate's Solid Braided—
Hercules, White ..... ₱ ℔, 25¢
Hercules, Drab ..... ₱ ℔, 30¢
Economy, Drab ..... ₱ ℔, 27¢
Economy White ..... ₱ ℔ 22¢
Ossawan Mills—
Braided, Giant, Whit ₱ ℔, 30¢ 20%
Braided Giant, Drab and Fancy, ₱ ℔ 35¢ 10%
Braided, Crown White, ₱ ℔, 50¢ .. 50%
Braided, Crown Drab and Fancy, ₱ ℔ 5¢ 30%

Wire Picture—
Braided or Twisted ..... 80&5@80&15%

Corkscrews—See *Screws, Cork.*

Corn Knives and Cutters See *Knives, Corn.*

Crackers Nut—
Table (H. & B. Mfg. Co) 40%
Blake's Pattern, ₱ doz., $2.00 ..... 10%
Turner & Seymour Mfg. Co 50%
Acme.
Japanned, ₱ gro., $30 ..... 50%
Nickel Plated, ₱ gro. $30 ..... 10%

Cradles—
Grain ..... 50&2@50&5&2%

Crayons—
White Crayons, ₱ gross ..... 7@8¢
D. M. Stewart Mfg. Co.:
Metal Workers', ₱ gross, $1.75 ..... 25%
Rolling Mill, ₱ gross, 2.50 ..... 25%
Railroad, ₱ gross, 2.00 ..... 25%
Soapstone Pencils, ₱ gross, 1.00 ..... 25%
See also *Chalk.*

Creamery Pails—See *Pails, Creamery.*

Crow Bars—See *Bars, Crow.*

Curry Combs— See *Combs, Curry.*

Curtain Pins— See *Pins, Curtain.*

Cutters—
Meat—
Dixon's, ₱ doz ..... 40@ 10&5%
Nos. 1 2 3 4
$14.00 $17.00 $19.00 $30.00
Woodruff's, ₱ doz ..... 40@ 10&5%
Nos. 100 150
$15.00 $18.00
Hale's, ₱ doz 70%
Nos. 11 12 13
$27.00 $33.00 $45.00
American 30%
Nos. 1 2 3 4 B 5
Each $5 $7 $10 $25 $50 $60
Enterprise 25%
Nos. 10 12 22 32 42
Each $3 $2.50 $4 $6 $15
Little Giant, ₱ doz ..... 40&1c@50%
Nos. 305 310 312 320 322
$35.00 $48.00 $44.00 $72.00 $68.00
Triumph No. 5-5, ₱ doz., $21.00 .. 25@ 30%
Miles' Challenge, ₱ doz ..... 45@45&10%
Nos. 1 2 3
$22.00 $30.00 $40.00
Home No. 1, ₱ doz., $26.00 ..... 55&10%
Draw Cut, each:
Nos. 5 2 6 8
$50 $75 $80 $225 ..... 20@25%
Beef Shavers (Enterprise) 20%
Chadborn's Smoked Beef Cutter, ₱ doz., $66.00

Slaw and Kraut—
Tucker & Dorsey Mfg. Co.:
Slaw Cutters, 1 Knife, ₱ gross .. $21.00
Slaw Cutters, 2 Knife, ₱ gross .. 30.00
Kraut Cutters 40%

Tobacco
Champion ..... 20&10@30%
All Iron ..... ₱ doz., $4.25
Nashua Lock Co.'s .. ₱ doz., $18.00, 50@55%
Wilson's 55%
Sargent's ..... ₱ doz., $24.00, 55&10
Acme ..... ₱ doz., $20.00, 40%

Washer—
Smith's Pat .... ₱ doz., $12.00, 20&10&10%
Johnson's ..... ₱ doz., $11.00, 33⅓%
Penny's .. ₱ doz.,, Pol. $14 ; Jap'd, $16, 55%
Appleton's ..... ₱ doz., $16.00, 60&10%
Bonney's ..... 30&10%
Cincinnati ..... 25&10%

Dampers, &c.—
Dampers, Buffalo ..... 40&10%
Buffalo Damper Clips ..... 40&10%
Crown Damper 40%
Excelsior Hot Air 50%

Diggers, Post Hole, &c.—
Samson, ₱ doz., $34.00 ..... 25@25&10%
Fletcher Post Hole Augers, ₱ doz., $36.00, 20@20&10%
Eureka Diggers ..... ₱ doz. $12.00@$13.00
Vaughan's Post Hole Auger, ₱ doz., $8.50@$9.50
Kohler's Little Giant ..... ₱ doz., $18.00
Kohler's Hercules ..... ₱ doz., $14.00
Kohler's Invincible ..... ₱ doz., $12.00
Kohler's New Champion .... ₱ doz., $8.00
Scheidler ..... ₱ doz., $18.00
Cronk's Post Bars, ₱ doz., $60.00, 50&5@50&10%
Gibb's Post Hole Digger ..... ₱ doz., $15.00
Gibbs' National ..... ₱ doz., $12.00
Gibbs' Columbia ..... ₱ doz., $13.00
Gibbs' Imperial ..... ₱ doz., $7.50
Shimer's Hollow Handle .. ₱ doz., $24.00, 50%

Dividers—See *Compasses.*

Dog Collars—See *Collars, Dog,*

Door Checks— See *Checks, Door.*

Door Springs— See *Springs, Door.*

Drawers.
Money, ₱ doz ..... $18@$20
Waddel's Improved, ₱ doz $15.00

Drawing Knives— See *Knives, Drawing.*

Drills and Drill Stocks—
Blacksmiths' ..... each $1.75
Blacksmiths' Self-Feeding, each $7.50, 20%
Breast, P. S. & W ..... 40&10%
Breast, Wilson's ..... 30&5%
Breast, Millers Falls ..... each $3.00, 25%
Breast, Bartholomew's .... each $2.50 25&10@40%
Ratchet, Merrill's ..... 20@20&5%
Ratchet, Ingersoll's 25%
Ratchet, Parker's ..... 20@20&5%
Ratchet, Whitney's ..... 20&10%
Ratchet, Weston's ..... 20@25%
Ratchet, Moore's Triple Action .. 25@30%
Ratchet, Curtis & Curtis 30%
Whitneys Hand Drill, Plain, $11.00; Adjustable, $12.00 ..... 20&10%
Automatic Boring Tools ..... $1.75@$1.85
Chicopee Automatic Drill ..... 20&10%
Goodell Automatic Drills ..... 40&5%

Twist Drills—
Cleveland ..... 50&10&10%
Diamond, W. & B ..... 50&10&10%
Graham's Pat. Groove Shank .. 50&10&10%
Morse ..... 50&10&10%
New Process ..... 50&10&10%
Standard ..... 50&10&10%
Syracuse (Metal list) ..... 50&10%

Drill Bits or Bit Stock Drills—See *Augers and Bits.*

Drill Chucks—See *Chucks.*

Dripping Pans— See *Pans, Dripping.*

Drivers, Screw—
Douglass Mfg. Co ..... 20@20&10%
Disston's 50%
Buck Bros. 30%
Stanley R. & L. Co.'s
No. 64, Varnished Handles ..... 65&10%
No. 86 ..... 70&10%
Sargent & Co.'s
No. 1, Forged Blade ..... 60&10&10%
Nos. 20, 40 and 60 ..... 66⅔&10&10%
P. S. & W 70%
Knapp & Cowles
No. 1 ..... 60&20@70%
No. 2 ..... 60&10&10@70&5%
No. 3 ..... 60&5@60&10%
Nos. 4 and 00, Acme and Ideal .. 50&5@50&10&5%
Stearns' ..... 25&10&5%
Gay & Parsons 35%
Champion ..... 25&10%
Clark's Pat ..... 30@33⅓%
Ellrich's Socket and Ratchet .. 25@25&10%
Allard's Spiral, new list 25%
Kolb's Common Sense .. ₱ doz., $6.00, 25&10%
Syracuse Screw-Driver Bits ..... 30&30&5%
Screw Driver Bits ..... ₱ doz., 50@75¢
Screw Driver Bitts, Parr's .. ₱ gross, $6.25
Fray's Hol. H dle Sets .. No. 3, $12.00, 45%
Cincinnati ..... 25&10%
Brace Screw Drivers ..... 25&10%
Buck Bros.' Screw Driver Bits .. 27½&5%
Goodell's Automatic 50%
Mayhew's Black Handle 50%
Mayhew's Monarch ..... 45&10%
C. T. Williamson Wire Novelty Co 50%

Egg Beaters—See *Beaters, Egg*

Egg Poachers— See *Poachers, Egg.*

Electric Bell Sets— See *Bells, Electric.*

Emery—No. 4 to No. 54 to Flour, CF.
	46 gr.	150 gr.	F.FF.
Kegs, ₱ ℔	4½¢	5 ¢	2½¢
½ keks, ₱ ℔ ..	4¾¢	5¼¢	2¾¢
¼ kegs, ₱ ℔ ..	5 ¢	5½¢	3 ¢
10-℔ cans, 10 in case	6 ¢	6½¢	5 ¢
10-℔ cans, less than 10	10 ¢	10 ¢	7½¢

Enameled and Tinned Ware—See *Ware, Hollow*

Escutcheon Pins— See *Pins, Escutcheon.*

Escutcheons—
Door Lock .... Same dis. as Door Locks.
Brass Thread ..... 60@60&10%
Wood 25%

Expanded Metal—
List No. 5.
Lathing 10%
Fencing, Painted Sheets 20%
Netting, Painted Sheets 20%
Door Mats, Galvanized 25%
Window Guards, Paneled 15%
Tree Guards, Paneled 15%

Extractors, Lemon Juice —See *Squeezers, Lemon.*

Fasteners, Blind—
Mackrell's, ₱ doz., $1.00 ..... 20@20&10%
Van Sand's Screw Pat, $15 ₱ gr.. 60&10%
Van Sand's Old Pat., $15 ₱ gr .... 55&10%
Austin & Eddy No. 2008 ..... ₱ gr., $9.00
Security Gravity ..... ₱ gr., $9.00
Zimmerman's ..... 50&10%

Faucets—
Fenn's 40%
Fenn's Cork Stops 33⅓%
Star 60%
Frary's Pat. Petroleum 60%
B. & L. B. Co.
West's Lock, Open and Shut Key .. 50%
Star, Metal Plug, new list 40%
Lockport, Metal Plug, reduced list .. 60%
Metallic Key, Leather Lined .... 60&10@60&10&10%
Cork Lined ..... 70&5@70&10%
Burnside's Red Cedar 50%
Burnside's Red Cedar, bbl. lots .... 50&10%
John Sommers'
Peerless Best Block Tin Key 40%
IXL, 1st quality, Cork Lined 50%
Diamond Lock 40%
Perfection, Fla. Red Cedar (in boxes) 40%
Boss Metallic Key 50%
Reliable Cork Lined 60%
O. K. Western Pattern Cork Lined .. 50%
No Brand, Red Cedar (In bbls.) .. 50&10%
Western Pattern Metal Key 40%
No Brand Metal Key 60%
Self Measuring
Enterprise, ₱ doz., $36.00 ..... 20%
Lane's ₱ doz., $36.00 ..... 25&10%

Felloe Plates— See *Plates, Felloe.*

Fibre Ware—See *Ware, Fibre.*

Fifth Wheels—
Derby and Cincinnati ..... 45&5%
Brewster ..... 50&5%

Files—
Domestic—
Nicholson Files, Rasps, &c. 60&10&5@60&10&10%
Nicholson (X.F.) Files 25%
Nicholson's Royal Files (Seconds) .... 75% (extra prices on certain sizes.)
American ..... 60⅔&10@66⅔&10&5%
G. & H. Barnett (Black Diamond) 60&10@60&10&5%
Arcade ..... 60&10&10@70%
Eagle ..... 60&10&10@70%
Other makers, best brands .. 60&10&5@70%
Fair brands ..... 70&10@70&10&10%
Second quality ..... 80&@80&5%
Heller's Horse Rasps ..... 50&7½@50&10%
McCaffrey's Horse Rasps ..... 50&10%
Chelsea Horse Rasps, Hand Cut .. 50&10%
Arcade Horse Rasps .... 60&10@60&10&5%
Trojan Horse Rasps ..... 60&10&5%

Imported—
Butcher ..... Butcher's list, 20%
Stubs ..... Stubs' list, 25@30%

Fixtures Grindstone—
Sargent's Patent ..... 70&10%
Reading Hardware Co ..... 30&10%
P., S. & W. Co ..... 60&10%
Moore's 55%

Fluting Machines— See *Machines, Fluting.*

Fluting Scissors— See *Scissors, Fluting.*

Fodder Squeezers— See *Squeezers, Fodder.*

Forks—
Hay, Manure, &c. Asso. List. 70@70&5&2%
Hay, Manure, &c., Phila. List, 60@60&10&2%
Plated, see Spoons.

Frames—
Saw—
White Vermont ..... ₱ gro., $9.00@$10.00
Red, Polished and Varnished .... ₱ doz., $1.50, 25%

Screen, Window and Door—
Porter's Pat. Window and Door Frame, 33⅓&10%
Warner's Screen Corner Irons .... 33⅓&@33⅓&10%
Stearns' Frames and Corners. 25@25&10%
Cortland ..... 40@40&5
Phillips' Window Screen Frames, 50@50&5%
Bonanza Window Screens .. 50&5@50&10%
Empire Fancy Screen Doors, ₱ doz .. $12

Freezers Ice Cream—
White Mountain ..... 60@60&5%
Granite State ..... 65@65&5%
Arctic ..... 70@70&5%
American 60%
Buffalo Champion ..... 65@65&5%
Shepard's Lightning ..... 65@65&5%
Gem 65%
Blizzard 70%
Double Action Crown 60%
Crown 60%
Star 60%
Peerless ..... 60&10%
Giant 60%
Zero 70%
Boss and Pet ..... 60&10&10%
Keystone, P., D. & Co., each, $1.50 .... 20%
Standard ..... 60@60&5%
Standard Double Action ..... 60@60&5%
Expert ..... 65@65&5%
Model ..... 60@60&5%
Confectioners' Machine 50%

Fruit and Jelly Presses— See *Presses, Fruit and Jelly.*

Fruit Pickers— See *Pickers, Fruit.*

Fry Pans—See *Pans, Fry.*

Funnels—
Gersdorff's Perfection, Standard and Globe; *Tin*, 1 gro., 10%; 2 to 5 gro., 20%; 5 to 10 gro. 30%
Copper, 1 to 3 doz., 15%; 6 to 12 doz., 20%; over 12 doz. 35%

Furnaces, Soldering—
Burgess No. 3 Gem tin reservoir $7.00
Burgess No. 3 Gem, Copper reservoir. $8.50
Clayton & Lambert No. 1 Fire-Pot, complete $6.00

Fuse—Dis. 12½&15%. ₱ 1000 ft.
Common Hemp Fuse, for dry ground. $2.70
Common Cotton Fuse, for dry ground 2.85
Single Taped Fuse, for wet ground.. 3.85
Double Taped Fuse, for very wet gr.. 4.80
Triple Taped Fuse, for very wet gr.. 5.60
Small Gutta Percha Fuse, for water. 7.50
Large Gutta Percha Fuse, for water. 12.00

Gates Molasses—
Stebbin's Pattern ..... 80@80&5%
Stebbin's Genuine ..... 60&10&10%
Stebbin's Tinned Ends ..... 40&10%
Lincoln's Pattern ..... 70@70&10%
Weed's ..... 20&10%
Boss, ₱ doz.:
No. 1, $7; No. 2, $8; No. 3, $9; No. 4, $10 ..... 60&10&10%

Gauges—
Marking, Mortise, &c. ..... 60&10%
Starrett's Surface, Center and Scratch. 25&10%
Stanley R. & L. Co.'s Butt and Rabbet Gauge. ..... 20&10%
Barrett's Comb. Roller Gauge, ₱ doz $8.00@$8.50
Hoague & Peck's Champion Gauge—
With Scale ..... ₱ doz., $5.00
Without Scale ..... ₱ doz., $4.00
Wire, Wheeler, Madden & Co 10%
Wire, Morse's 25%
Wire, Brown & Sharpe's ..... 10@20%
Wire, P., S. & W. Co ..... 10&10%

Gimlets—
Nail and Spike ..... 50&10&5%
Eureka Gimlets ..... 60&10%
Diamond Gimlets ..... ₱ gr $5.00
Double Cut, Shepardson's ..... 45@45&5%
Doub e Cut, Ives' ..... 60@60&5%
Double Cut, Douglass' ..... 40&10%

Glue—
Le Page's Liquid ..... 25@25&5%
Upton's Liquid 35%
Improved Process ..... 25@25&5%
Dodd's Liquid Glue ..... 25@25&5%

Glue Pots—See *Pots, Glue.*

Grease, Axle—
Fraser's ..... Keg ₱ ℔ 4¢, Pail ₱ ℔ 5¢
Fraser's, in boxes ..... ₱ gr $9.50
Dixon's Everlasting, in bxs. ₱ doz 1 ℔ $1.20 ; 2 ℔ $2.00
Dixon's Everlasting .... 10-℔ pails, ea. 35¢
Lower grades, special brands, ₱ gr $5.50@$7.00
Axleine, tin boxes ..... ₱ gross $12.00
English Coach, wooden boxes ..... ₱ gross $3.50
English Coach, 5-℔ tin pails. ₱ doz. $3.50
Tiger, wooden boxes ..... ₱ gross $7.00
Tiger, 5-℔ tin pails ..... ₱ doz $2.85

Grindstones—
Family, regular list 60%
Family, Cleveland Stone Co 20%

Grindstone Fixtures— See *Fixtures, Grindstone.*

Gun Powder —See *Powder.*

Hack Saws—See *Saws.*

Hafts, Awl—
Sewing, Brass Fer. ₱ gr $1 75
Pat. Sewing, Short. ₱ doz ..... 45@50%
Pat. Sewing, Long ..... ₱ doz $1.20
Pat. Peg, Plain Top. ₱ doz ..... 40@45%
Pat Peg, Leather Top. ₱ doz @50%

Halters—

Covert's, Rope, Jute.....60&10&10&2%
Covert's Rope, 7-16-in., Jute.....70&2%
Covert's Rope, ½-in., Hemp.....50&2%
Covert's Adj. Rope Halters.....40&2%
Covert's Hemp Horse and Cattle Tie, 50&10&2%
Covert's Jute Horse Ties.....70&2%
Covert's Jute Cattle Ties.....70&10&2%
Covert's Adj. Web Halters.....35&5&2%
Covert's Saddlery Works Halters...33⅓%
Covert's Saddlery Works Horse and Cattle Ties.....33⅓%
Covert's Saddlery Works Handy Web Halters.....33⅓%

Hammers—

Handled Hammers—

Maydole's, list Dec. 1, '85.....25&10@35%
Buffalo Hammer Co.
Humason & Beckley.....50&10%
Atha Tool Co.
Verree.....
C. Hammond & Son.....40&10@—%
Fayette R. Plumb.
Artisans' Choice, A. E. Nail.....40&10%
Regular Y. & P., A. E. Nail.....50%
Horseshoe Turning Hammers.....50%
Other Hammers.....50&10%
Cheney's Claw.....40&10%
Cheney's Machinist's & Riveting...50&5%
Magnetic Tack, Nos. 1, 2, 3, $1.25, 1.50 & 1.75.....30&10%
Nelson Tool Works.....40&10%
Warner & Nobles, new list.....25&10
Peck, Stow & Wilcox.....35@40%
Sargent's.....40@40&10%

Heavy Hammers and Sledges—

8 ℔ and under...℔ @40¢ / ℔ @36¢ — 75&10@75&10 &5%
8 to 5 ℔.....
Over 5 ℔.....℔ @30¢
Wilkinson's Smiths.....10½¢@11¢℔ ℔

Handcuffs and Leg Irons

—See *Police Goods.*

Handles—

Cross-Cut Saw Handles—

Atkins', new list.....40%
Champion.....15%
Ely's Perfection.....℔ doz., $3.00

Iron, Wrought or Cast—

Door or Thumb.

Nos.	0	1	2	3	4
Per doz.	$0.90	1.00	1.08	1.35	1.50

60&10&10%

Roggin's Latches.....℔ doz 30¢@35¢
Bronze Iron Drop Latches..℔ doz 70¢ net
Jap'd Store Door Handles—Nuts, $1.62; Plate, $1.10; no plate, $0.88.....net
Barn Door, ℔ doz $1.40.....10&10%
Chest and Lifting.....70@70&10%

Wood—

Saw and Plane.....40&10@50%
Hammer, Hatchet, Axe, &c.....40@40&5%
Brad Awl.....℔ gr $2.00
Hickory Firmer Chisel, ass'd.℔ gr 4.50
Hickory Firmer Chisel, large.℔ gr 5.00
Apple Firmer Chisel, ass'd...℔ gr 5.00
Apple Firmer Chisel, large...℔ gr 6.00
Socket Firmer Chisel, ass'd..℔ gr 3.00
Socket Framing Chisel, ass'd.℔ gr 5.00
} 40&10@50%
J. B. Smith & Co.'s Pat File.....50%
File, assorted.....℔ gr 2.75
Auger, assorted.....℔ gr 5.00 } 50%
Auger, large.....℔ gr 7.00
Pat. Auger, Ives'.....30&10%
Pat. Auger, Douglass.....℔ set $1.25
Pat. Auger, Swan's.....℔ set $1.00
Hoe, Rake, Shovel, &c.....60@60&5%

Hangers—

Barn Door, old patterns.....70@70&5%
Barn Door, New England.....70@70&5%
Samson Steel Anti-Friction.....55%
Orleans Steel.....55%
Hamilton Wrought Steel Track.....55%
Champion.....60&10%
Climax Anti-Friction.....55%
Zenith for Wood Track.....55%
Sterling.....50&10@60%
Victor, No. 1, $15.00; No. 2, $16.50; No. 3, $18.00.....50&2%
Kidder's.....50@50&10%
Boss.....60&10@60&10&5%
Best Anti-Friction.....60&10@60&10&5%
Duplex (Wood Track).....60&10&5%
Terry's Modern.....50&10@50&10&5%
Terry's Ideal.....50&10@50&10&5%
Terry's Solid.....50&10@60%
Terry's Shield.....50&10@60%
Terry's Wrought Single Strap.....50&10%
Cronk's Patent, Steel Covered.....50&10%
Carrier Steel Anti-Friction.....50&10%
Richards'.....30@30&10%
Lane's New Standard.....50@50&5%
Lane's Standard.....50&5@50&10%
Lane's Parlor.....40%
Warner's Pat.....20&10&10%
Stearns' Anti-Friction.....20&10&10%
Stearns' Challenge.....25&10&10%
Cincinnati Nos. 1, $2.25; 3, $2.50; 4, $2.50.
Paragon, Nos. 5, 5¼, 7 and 8.....20&10%
Crescent.....60@60&10%
Nickel, Steel, Nos. 0, $25; 1, $20; 2, $15. 40&10@50%
Chicago Anti-Friction.....30&10%
Star.....40&10@40&10&5%
Barry.....50%
Interstate.....50&10@60%
Pendulum, Payson's.....40@40&10%
Moody.....45%
Economy, $6.00.....50&10%
Perfection.....50&10@50&10&5%
Lundy, Steel Parlor.....40%
Matchless.....50&10%
Magic.....45&10%
Wild West.....45&10%
Moore's Elevator.....33⅓%
Moore's Baggage Car Door.....33⅓%
Moore's Railroad.....55%

Harness Snaps—See *Snaps.*

Hatchets—

American Axe and Tool Co.
Blood's.....
Hunt's.....
Hurd's.....
Mann's.....
Peck's.....
Underhill's.....
} 40 & 10 %
Buffalo Hammer Co.....
Fayette R. Plumb.....
C. Hammond & Son.....
Kelly's.....
Sargent's & Co.....
P., S. & W. Co.....
} 50&5%
Ten Eyck Edge Tool Co.....
Collins.....10%
Schulte, Lohoff & Co.....50@5&5%

Hay and Straw Knives—

See *Knives.*

Hinges—

Blind Hinges—

Parker.....75&2%
Huffer.....50%
Clark's, Nos. 1, 3, 5, 40 and 50..80@80&5%
Clark's Mortise Gravity.....50%
Sargent's, Nos. 1, 3, 5, 11, 12, 13.75@75&10%
Reading's Gravity.....75&10@75&10&5%
Shepard's.
Noiseless.....75&10%
Niagara.....80%
Buffalo.....80%
Clark's Genuine Pattern.....80%
O. S., Lull & Porter.....75&10%
Acme, Lull & Porter.....75%
Queen City Reversible....70&10&5@75%
Clark's, Lull & Porter, Nos. 0, 1, 1½, 2, 2½, 3.....75&10&2½%
North's Automatic Blind Fixtures, No. 2, for Wood, $9.00; No. 3, for Brick, $11.50.....10%

Gate Hinges—

Western.....℔ doz $4.20, 60@60&10%
N. E.....℔ doz $7.80, 60@60&10%
N. E. Reversible ℔ doz..$5.60, 6 @60&10%
Clark's, Nos. 1 2, 3.....60&10&5%
N. Y. State.....℔ doz $4.90,60@60&10%
Automatic.....℔ doz $12.50, 50%
Shepard's.....60&10&5%

Spring Hinges—

Geer's Spring and Blank Butts....40%
Union Spring Hinge Co.'s list, March, 1886.....20%
Barker's Double Acting.....25%
Union Mfg. Co.....25%
Bommer's.....30%
Buckman's.....15@20%
Chicago.....30%
Bardsley's Patent Checking.....15%
Acme.....30%
U. S.....25&10%
Empire and Crown.....20%
Hero and Monarch.....55%
American, Gem and Star.....20%
Oxford.....20%
Royal.....66⅔%
Reliable.....60%
Champion.....60%
No. 10 Matchless.....60%
No. 25 Unbreakable.....60%
J. G. C. Covered, ℔ gro., $30.....50&5%
Samson.....60@60&7½%
Wiles', No. 1, ℔ gro., $16; No. 2.....$13
Rex.....℔ gro., $13.00
Devore, No. 1.....℔ gro., $12.00
Freeport.....℔ gro., $13.00
New Idea Nos. 1 and 10....℔ gross $13.00
New Idea Dbl. Acting.....45%
Ideal No. 3.....℔ gross $10.00
Stearns' Noiseless Floor Hinge, ℔ set, $5.00.....20&10@30%

Extra 5@10% often given.

Wrought Iron Hinges—

List February 14, 1891.
Strap and T.....50&10@50&10&5%
Corrugated Strap and T.....50&10&5%
Screw Hook and Strap... { 6 to 12 in., ℔ ℔.. 4¢ / 14 to 20 in., ℔ ℔..3½¢ / 22 to 36 in., ℔ ℔.. 3¢
Screw Hook and Eye.... { ⅝ in., ℔ ℔ 7¾¢ / ¾ in., ℔ ℔ 5¾¢ / ⅞ in., ℔ ℔ 4¾¢
Rolled Blind Hinges, Nos. 32 and 34 50&10%
Rolled Blind Hinges, Nos. 252 and 234 55&10%
Rolled Plate.....70&10%
Rolled Raised.....70&10¢
Plate Hinges { 8, 10 & 12 in., ℔ ℔.....5¢ / "Providence" { over 12 in. ℔ ℔.....4¢

Hoes—

Eye—

D. & H. Scovil.....20%
Lane's Crescent, Planters' Pattern.45&5%
Lane's Razor Blade, Scovil Pattern...30%
Maynard, S. & O. Pat.....45&5%
Sandusky Tool Co., S. & O. Pat } 60&5
Am. Axe and Tool Co., S. & O. Pat } @60&10%
Chattanooga Tool Co., S. & O. Pat..60& 5@60&10%
Grub.....60&10%

Handled—

Garden, Mortar, &c.....70@70&5&2%
Planter's, Cotton, &c.....70@70&5&2%
Warren Hoe.....60@60&5%
Magic.....℔ doz $4.00

Hog Rings and Ringers—

See *Rings and Ringers—*

Hoisting Apparatus—

See *Machines, Hoisting.*

Hollow-Ware—

See *Ware, Hollow.*

Holders—

Bag—

Sprengle's Pat.....℔ doz $18....60%

Bit—

Extension.
Barber's, ℔ doz $15.00.....40@40&10%
Ives, ℔ doz $20.00.....60&5@60&10%
Diagonal.....℔ doz $24.00, 40%
Angular.....℔ doz $24.00, 40&5%

File and Tool—

Balz Pat.....℔ doz $4.00, 25%
Nicholson File Holders.....20%

Sash—

Motley's Adj. Sash, Medium Size.....℔ doz $1.20, 40%

Hooks—

Cast Iron—

Bird Cage, Sargent's List....
Bird Cage, Reading.....
Clothes Line, Sargent's list .
} 60&10&10%
Clothes Line, Moore's.....70%
Clothes Line, Reading list. 60&10@60&10&10%
Ceiling, Sargent's list.....55&10&10%
Harness, Reading list..55&10@55&10&10%
Coat and Hat, Sargent's list. 55&10@60&10%
Coat and Hat, Reading. 50&10@50&10&10%
Coat and Hat, Moore's.....70%

Wrought Iron—

Cotton.....℔ doz $1.25
Cotton Pat. (N. Y. Mallet and Handle W'ks.....30%
Tassel and Picture, T. & S. Mfg.Co....50%
Wrought Staples Hooks, &c. See Wrought Goods

Wire—

Wire Coat and Hat, Gem, list April, 1886.....60@60&10
Wire Coat and Hat, Miles, list April, 1886.....50@50&10%
Indestructible Coat and Hat...45@45&5%
Wire Coat and Hat, Standard.60@60&10%
Handy Hat and Coat.....50&10@60%
Steady Ceiling Hooks.....50&10@60%
Belt.....80&15@80&20%
Atlas, Coat and Hat.....65%
Williamson's Bird Cage Hooks, List April, 1892.....40%
Bright Wire Goods—See Wire.

Miscellaneous—

Grass, No.2, $2.00; No.3, $2.10; No. 4, $2.25
Nolin's Grass.....℔ doz $2.25
Bush.....55@60%
Whittletree—Patent.....55%
Hooks and Eyes—Malleable Iron. 70@70&10%
Hooks and Eyes—Brass.....60&10&10%
Fish Hooks, American.....50%
Bench Hooks—See Bench Stops.

Horse Nails—See *Nails, Horse*

Horse Shoes—

See *Shoes, Horse.*

Hose, Rubber—

Competition, Fair quality.....75@75&10%
Competition, Low Grade.....80@80&10
Standard.....70&10&70@10&5%
Extra.....60&10@60&10&10%
N. Y. B. & P. Co., Para.....25&5%
N. Y. B. & P. Co., Extra.....40&5@50%
N. Y. B. & P. Co., Dunlop.....60@60&5%
Cotton Garden, ¾ in., coupled:
Fair Quality, ℔ ℔.....7¢
Good Quality, ℔ ℔.....8½¢

Huskers—

Blair's Adjustable.....℔ gr $8.00
Blair's Adjustable Clipper.....℔ gr 7.00
Hubbard's Solid Steel.....℔ gr 4.50

Indurated Fiber Ware—

See *Ware, Indurated Fiber.*

Irons.

Sad—

From 4 to 10, at factory....℔ 100 ℔, $2.30@$2.40
Self-Heating.....℔ doz $8.00
Self-Heating Tailors'.....℔ doz $18.00
Mrs. Potts' Sad Irons, per set:

No.	50	55	60	65
25 doz.	$0.78	$0.73	$0.90	$0.82
12 "	.83	.78	.97	.88
Small lots.	.90	.85	1.05	.95

Crown.....60&10%@60&10&5%
Ideal Irons, new list...50&10@50&10&10%
Salamander Irons.....25%
B. B. Sad Irons, ℔ ℔.....3@3½¢
Chinese Laundry (N.E.Butt Co.).8½¢, 15%
New England.....5¢, 20@20&5%
Mahony's Troy Pol. Irons.....25%
Sensible, list Jan. 91.....50&10&5%
Sensible Tailor's Irons.....33⅓%
National Self-Heating.....30%

Soldering—

Soldering Coppers.....℔ ℔ 19@21¢
Covert's Adjustable, list Jan. 1, 1886, 35&2%
Tinker's Dread. ℔ doz $1.75; ℔ gro. $18

Pinking—

Pinking Irons, ℔ doz., 55@60¢.

Jack Screws—See *Screws.*

Jacks, Wagon—

Daisy.....33⅓%
Victor.....33⅓%
Lockport.....40%

Kettles—

Brass, Spun, Plain, list Jan. 1, '91..25&5%
Brass, Spun, Pld.W.M.list Jan. 1, '91..20%
Stamped Brass Kettles.....℔ ℔ 21¢
Enameled and Tea—See *Ware, Hollow.*

Keys—

Lock, Ass'n list Dec. 30, 1886..65&10@70%
Eagle, Cabinet, &c.....33⅓&2%
Hotchkiss' Brass Blanks.....40%
Hotchkiss' Copper and Tinned.....40%
Hotchkiss' Pad. and Cab.....35%
Wollensak Tinned.....50&10%

Knife Sharpeners—

See *Sharpeners, Knife.*

Knives—

Butcher, Shoe, &c.

Wilson's Butcher Knives, List Dec 8, 1890.....25%
Ames' Butcher Knives.....25%
Foster Bros.' Butcher, &c.....40%
Jordan's Aa A1 Butchers', list.....net
Nichols' Butcher Knives.....40&10%
W. W. Wilson, Butcher, 6 in., $2.00; 7 in., $2.70; 8 in., $3.80, &c.
Ames' Shoe Knives.....20@25%
Ames' Bread Knives, ℔ doz $1.50, 15@20%
Moran's Shoe and Bread.....20@20&10%
Hay and Straw—See Hay Knives.
Table and Pocket—See Cutlery.

Corn—

Bradley's.....10%
Wadsworth's.....25@25&10%

Drawing—

Witherby.....
P., S. & W.....
Mix.....
New Haven.....
} ...75@75&10&5%
Merrill.....60&10@60&10&5%
Douglass.....75&75@5
Watrous.....15&10@25%
L. & I. J. White.....20&t 3
Bradley's.....35%
Adjustable Handle.....25@33⅓%
Wilkinson's Folding.....25@25&5%

Hay and Straw—

Lightning, from jobbers....$8.00@$9.00
Wadsworth's.....40&7½@40&10%
Carter's Needle...℔ doz. $11.00@$11.50
Heath's.....℔ doz. $13.00@$13.50
Nolin's Hay.....℔ doz. $7.00@$8.00

Mincing—

Am. (2d quality), ℔ gr., 1 blade, $7 2 blades, $12; 3 blades, $18.....net
Lothrop's.....20&10%
Smith's, ℔ doz., Single, $2; Double $3 45@60%
Knapp & Cowles.....50&10@60%
Buffalo Adjustable....℔ doz. $3.00, 33⅓%

Knobs—

Door, Mineral.....60@65%
Door, Por. Jap'd.....70@75%
Door, Por. Nickel.....$2.00@$2.25
Door, Por. Plated Nicke..l... $2.00@$2.25
Drawer, Porcelain....60&10@60&10&10%
Hematite Door Knobs.....40&10@50%
Yale & Towne Wood, list Dec., 1885...40%
Base, Rubber Tip.....70&10&5%
Picture, Judd's.....60&10&10@70%
Picture, Sargent's.....70&10%
Picture, Hematite.....35&5%
Shutter, Porcelain.....65& 10%
Carriage, Jap.....℔ gro 80¢, 60&10%
Bardsley's Wood Door, Shutter, &c...15%

Ladders.

Davies Extension and Single.....20&5%

Ladies—

Melting, Sargents'.....60@60&5%
Melting, Reading.....35&10%
Melting, P., S. & W.....35&10@40%
Melting, Warner's.....30%

Lanterns—

Tubular—

Regular, with Guard.....℔ doz $3.50
O. K., with Guard.....℔ doz $3.75
Side Lift, with Guard.....℔ doz $4.00
Square Lift, with Guard.....℔ doz $4.25
Anti-Friction, with Guard....℔ doz $4.50
Brass Plated, Sq. Lift, Guard.℔ doz $5.50
Cop. Plated, Sq. Lift, Guard..℔ doz $5.50

Bull's Eye Police—

2¾-inch regular.....℔ doz $3.60
3-inch regular.....℔ doz $3.90
2¾-inch flash light.....℔ doz $4.00
3-inch flash light.....℔ doz $4.50

Lawn Mowers—

See *Mowers, Lawn.*

Leaders, Cattle—

Humason, Beckley & Co.'s.....70%
Sargent's.....70&10@70&10&10%
Hotchkiss.....80%
Peck, Stow & W. Co.....60&10%

Lemon Squeezers—

See *Squeezers, Lemon.*

Lifters, Transom—

Wollensak's:
Class 3 and 4, Bronzed Iron.....60%
Class 3 and 4, Bronze Metal.....50%
Class 3 and 4, Brass.....50%
Skylight Lifters.....35%
Reiher's, list Feb. 20, 1891
Bronzed Iron Rods.....60@60&10%
Brass, Real Bronze or Nickel Plate..30%
Excelsior.....50&10&2%
Shaw's.....50&10%
Payson's:
Universal.....60%
Solid Grip.....60&10@60&10&10%
Imperial.....50&10%

Lines—

Cotton and Linen Fish.....50%
Chalk.....60%
Masons' Linen, 84 ft., No. 1, $1.25; No. 2, $1.75; No. 3, $2.25; No. 4, $2.75; No. 5, $3.25.....25%
Cotton Chalk.....55%
Samson Cotton, No. 4, $2; No. 4½, $2.50; 10%
Silver Lake, Braided No. 0, $6.00; No. 1, $6.50; No. 2, $7.00; No. 3, $7.50 ℔ gro.....35%
Mason's Linen, No. 3½, $1.50; No. 4, $2.00; No 4½, $2.50.
Mason's Colored Cotton.....45%
Wire Clothes..Nos. 18 19 20
100 ft..... $3.50 $3.00 $2.50
Ventilator Cord, Samson Braided, White or Drab Cotton..℔ doz $7.50..30%
Ossawan Mills, Chalk, Twisted, 60%; Chalk, Soft Braided, 50% Chalk, Braided, 25%.

Links, Open—

Terry's—per gro.:

Nos.	1	2	3	4
	$6.00	8.00	12.00	16.00

Locks, &c.—

Cabinet—

Eagle, Gaylord Parker and Corbin... } List March, '84, rev. Jan. 1, '85.33⅓&2%
Deitz, Nos. 36 to 39.....40%
Deitz, Nos. 51 to 63.....40&10%
Deitz, Nos. 87 to 96.....30%
Champion Night Latches.....40%
Barnes Mfg. Co.....40@40&10%
Eagle and Corbin Trunk.....25&10
Champion Cab. and Combin.....33⅓%
Yale.....net prices
Romer's.....25

Door, Locks, Latches, &c.—

R. & E. Mfg. Co., list Mar.20, 1889.....
Mallory, Wheeler & Co., list July, '88.....
Sargent & Co., List Aug.1, '88
Branford Lock Works
} 65&10@70% Much lower net prices often made

Brittan, Graham & Mathes, list Jan. 1890.....60&10&10%
Plate.....33⅓&2%
Barnes Mfg. Co.....40@40&10%
Yale.....net prices
Deitz Flat Key.....30%
Romer's Night Latches.....15%
Brooklyn Latches.....50&10%
Warner's Burglar Proof, ₩ doz. $8.00, 50%

Elevator—

Moore's.....33⅓%

Padlocks—

List June 10, 1891.....50&2%
Norwich Lock Mfg. Co., old list.....50&2%
Yale Lock Mfg. Co.'s.....net prices
Eagle.....40%
Eureka, Eagle Lock Co.....40&2%
Romer's Nos. 0 to 91.....30%
Romer's Scandinavian, &c., Nos. 100 to 505.....15%
A. E. Deitz.....40%
Champion Padlocks.....40%
Hotchkiss.....30%
Star.....60%
Horseshoe.....₩ doz $9, 50&50&10%
Barnes Mfg. Co.....40@40&10%
Nock's.....30%
Scandinavian.....90&40%
E. T. Fraim's Keystone Scandinavian, Nos. 119, 120, 130 and 140.....90&10%
Other Nos.....65%
Ames Sword Co. up to No. 150.....40%
Ames Sword Co. above No. 150.....50%
Slaymaker, Barry & Co.
No. 1010 line.....90&5%
No. 41 line.....50%
No. 61 line.....60%
No. 21 line.....80%

Sash, &c.—

Clark's No. 1, $10; No. 2, $8 ₩ gr.....33⅓&%
Ferguson's.....33⅓&
Victor.....60&10&2%
Walker's.....10%
Attwell Mfg. Co.....25&33⅓&
Reading.....66⅔&10@66⅔&10&10%
Hammond's Window Springs.....40%
Common Sense, Jap'd, Cop'd and Br'zed.....₩ gr $4.00
Common Sense, Nickel Plated. ₩ gr $10.00
Universal.....30%
Kempshall's Gravity.....60%
Kempshall's Model.....60@60&10%
Corbin's Daisy, list Feb. 15, 1886.....70%
Payson's Perfect.....60&10&10%
Hugunin's Sash Balances.....25&5&2%
Hugunin's New Sash Locks.....25&5&2%
Ives Patent.....60&10&5@60&10&10%
Fish (Lieseche's pat.), No. 100, ₩ gr., $8; No. 105, ₩ gr., $10.....50%
Davis, Bronze, Barnes Mfg. Co.....60%
Champion Safety list January, 1893.70&5%
Security.....70%
Giant, list Jan., 1892.....70&5%
Wolcott's.....60&10&5%
Monarch.....50%

Lumber Tools—

See *Tools, Lumber.*

Lustro—

Four-ounce bottles.....₩ doz, $1.75; ₩ gross.....$17.00

Machines.

Boring—

	Without Augers.	Upright.	Angular.
Douglas	$5.50	$6.75	50%
Snell's, Rice's Pat...	5.50	6.75	40&10&10%
Jennings'	5.50	6.75	45@45&10%
Other Machines	2.35	2.75	
Phillips' Patent with Augur	7.00	7.50	
Miller's Falls	7.50		25%

Fluting—

Knox, 4½-inch Rolls.....$3.25 each } 35%
Knox, 6-inch Rolls.....$3.60 each }
Eagle, 3¼-inch Rolls, $2.15.....35%
Eagle, 5¼-inch Rolls, $2.85.....35%
Crown, 4½ in., $3.50; 6 in., $4.00; 8 in., $6.50 each.....35%
Crown Jewel, 6 in.....$3.50 each, 35%
American, 5 in., $3.00; 6 in., $3.40; 7 in., $4.50 each.....35%
Domestic Fluter.....each, $1.50
Geneva Hand Fluter, White Metal, ₩ doz $12, 25%
Crown Hand Fluter, Nos. 1, $15.00; 2, $12.50; 3, $10.00; 4, $8.25.....30%
Shepard Hand Fluter, No. 85, per doz $15.50.....40%
Shepard Hand Fluter, No. 110, ₩ doz $11.00.....40%
Shepard Hand Fluter No. 95, ₩ doz $8.00.....40%
Combined Fluter and Sad Iron. ₩ doz $15.00.....30%

Hoisting—

Moore's Hand Hoist, with Lock Brake.20%
Moore's Anti-Friction Differential Pulley Block.....20%
Moore's Rope Differential Pulley Block.....60%
Energy Mfg. Co.'s.....25%
See also *Blocks.*

Washing—

Anthony Wayne, ₩ doz, No. 1, $42; No. 2, $36; No. 3, $42.
Wayne American.....₩ doz $36.00
Western Star ₩ doz, No. 2, $36; No. 3 $39.
Weisell.....₩ doz $54.00
Fair and Square.....₩ doz $42.00

Mallets—

Hickory.....20&10@20&10&10%
Lignumvitæ.....20&10@20&10&10%
S. & L. Block Co., Hickory & L. V. 30@30&10

Mattocks—Regular list, 60&10@60&10&5%

Measures—

Standard Fiberware, No. 1, peck ₩ dozen, $3.50; ½-peck, $3.00

Meat Cutters—

See *Cutters, Meat.*

Menders, Harness—

Per doz.....$2.00

Milk Cans—See *Cans, Milk.*

Mills—

Coffee—

Box and Side, List, Jan. 1, 1893..60@60&5%
Net prices are often made which are lower than above discount.
American, Enterprise Mfg. Co., list Jan. 17, 1893.....20%
The Swift, Lane Bros.....30%
Waddell's New Box Mills, Ideal Brand, New List.....60%

Mincing Knives—

See *Knives, Mincing.*

Molasses Gates—

See *Gates, Molasses.*

Money Drawers—

See *Drawers, Money.*

Mowers, Lawn—

Best Machines: 10-in., $4; 12-in., $4.50; 14-in., $5; 16 in., $5.50; 18-in., $6.
Low-Grade Machines: 10-in. $3; 12-in., $3.25 14-in., $3.50 each

Muzzles—

Safety.....₩ doz, $3.00, 25%

Nails.—

Cut and Wire. See Trade Report.
Wire Nails, Papered.
Association list, May 1, '92.80&10&10&5%
Tack Mfrs.' list.....70&5@70&10%
Hungarian, Finishing, Upholsterers', &c. See *Tacks.*

Horse—

	Nos. 6	7	8	9	10	
American	85¢	85¢	85¢	85¢	85¢	net
Ausable	28¢	26¢	25¢	24¢	23¢	40&10&2%
Clinton, Fin.	19¢	17¢	16¢	15¢	14¢	30&10%
Essex	28¢	26¢	25¢	24¢	23¢	40&10&5@50&5%
Lyra	19¢	17¢	16¢	15¢	14¢	40&10%
Snowden	19¢	17¢	16¢	15¢	14¢	40&10%
Vulcan	23¢	21¢	20¢	19¢	18¢	...25%
Northwest'n.	25¢	23¢	22¢	21¢	20¢	25@25&5%
A. C.	25¢	23¢	22¢	21¢	21¢	25&10@33⅓&5%
C. B. K.	25¢	23¢	22¢	21¢	21¢	33⅓@33⅓&10%
Maud S.	25¢	23¢	22¢	21¢	21¢	40&10&5%
Champlain	28¢	26¢	25¢	24¢	23¢	40&5&5&2%
Saranac	23¢	21¢	20¢	19¢	18¢	...40&5%
Champion	25¢	23¢	22¢	21¢	20¢	10&10&10%
Capewell.	19¢	18¢	17¢	16¢	16¢	...10&5%
Anchor	23¢	21¢	20¢	19¢	18¢	...35%
Western	23¢	21¢	20¢	19¢	18¢	...50%
Empire Bronzed						13@14 ₩ ℔

Picture—

Brass Head, Sargent's list.....60@60&10%
Brass Head, Combination list.....50&10%
Porcelain Head, Sargent's list.50&10&10%
Porcelain Head, Combination list.40&10%
Niles' Patent.....40%

Nail Pullers—See *Pullers, Nail.*

Nail Sets—See *Sets, Nail.*

Nut Crackers—

See *Crackers, Nut.*

Nuts—List Dec. 18, 1889.

	Square.	Hex.
Hot Pressed	5.80¢	6.50¢ off list
Cold Punched	5.00¢	5.10¢ off list

In packages of 100 ℔, add 1-10¢ ₩ ℔, net; in packages less than 100 ℔, add ½¢ ₩ ℔, net.

Oakum—

Best or Government. . .....₩ ℔ 6¾@7¼¢
U. S. Navy.....₩ ℔ 5¾@6¢
Navy.....₩ ℔ 5¢@5¼¢

Oil Tanks—See *Tanks, Oil.*

Oilers—

Zinc and Tin.....65&10@70&5%
Brass and Copper.....50&10@50&10&5%
Malleable, Hammers' Improved, No. 1, $3.60; No. 2, $4.00; No. 3, $4.40 ₩ doz. 10@10&5%
Malleable, Hammers' Old Pattern, same list.....45%
Prior's Pat. or "Paragon" Zinc. 60&10&10%
Prior's Pat. or "Paragon" Brass.....50%
Olmstead's Tin and Zinc.....60%
Olmstead's Brass and Copper.....50%
Broughton's Zinc.....60%
Broughton's Brass.....50%
Steel, Draper & Williams.....50%

Openers, Can—

Messenger's Comet.....₩ doz $3.00, 25%
American.....₩ gross $2.75@$3.00
Duplex.....₩ doz 25¢, 15@20%
Lyman's.....₩ doz $3.75, 20%
No. 4, French.....₩ doz $2.25, 55@60%
No. 5, Iron Handle.....₩ gr $6.00, 45@50%
Eureka.....₩ doz $2.50, 10%
Sardine Scissors.....₩ doz $2.75@3.00
Star.....₩ doz $2.75
Sprague, No. 1, $2.00; 2, $2.25; 3, $2.50; 66⅔&70%
Excelsior, No. 1 $2.50; No. 2, $1.50.....40%
World's Best ₩ gross, No. 1, $12.00; No. 2, $24.00; No. 3, $36.00.....50&10%
Universal, ₩ doz $3.00.....55&5%
Domestic, ₩ doz $2.00.....45%
Champion, ₩ doz $2.00.....50%
Moore's.....70%

Packing, Steam—

Rubber—

Standard.....70@70&10%
Extra.....60@60&5%
N. Y. B. & P. Co., Standard.....50%
N. Y. B. & P. Co., Empire.....60%
N. Y. B. & P. Co., Salamander.....25%
Jenkins' Standard, ₩ ℔ 80¢.....25@25&5%

Miscellaneous—

American Packing.....10¢@11¢ ₩ ℔
Russia Packing.....14¢ ₩ ℔
Italian Packing.....13¢@14¢ ₩ ℔
Cotton Packing.....15¢@17¢ ₩ ℔
Jute.....7¢@8¢ ₩ ℔

Pails—

Creamery—

S. S. & Co.: 18-qt., $7.00; 20-qt., $7.25 per doz.....5%

Galvanized—

	Quarts	10	12	14
Hill's Light Weight, ₩ doz.	$2.75	3.00	3.25	
Hill's Heavy Weight, ₩ dz.	3.00	3.25	3.75	
Helwig's	2.50	2.75	3.00	
Sidney Shepard & Co.	2.50	2.75	3.00	
Iron Clad	2.50	2.75	3.00	
Fire Buckets	2.75	3.25	3.50	

Buckets—See Well Buckets.

Indurated Fiber Ware—25%

Star Pails, 12 qt.....₩ doz $4.20
Milk, 14 qt.....₩ doz $5.40
Stable, 14 qu.....₩ doz $6.00
Fire Pails, deep.....₩ doz $4.80
Fire Pails, round bottom.....₩ doz $5.40

Standard Fiber Ware—

	Plain.	Decr'd
Water Pails, 12 qt., ₩ doz.	$3.60	$4.00
Dairy Pails, 14 qt., ₩ doz.	4.00	4.50
Fire Pails, No. 1, 12 qt., ₩ doz	4.00	
Fire Pails, No. 2, 14 qt., ₩ doz	4.50	
Sugar Pails	5.50	6.00
Horse Pails	4.50	
Buggy Pails	3.50	
Slop Jars (bal. trap)	7.50	8.50
Chamber Pails, 14 qt.	6.00	7.00

Pans—

Dripping—

Small sizes.....₩ ℔ 5½¢
Large sizes.....₩ ℔ 5¢
Silver & Co. (Covered).....40%

Fry—

Standard List:

No.	0	1	2	3	4
₩ doz.	$3.00	$3.75	$4.25	4.75	$5.25
No.	5	6	7	8	
₩ doz.	$6.00	$7.00	$8.00	$9.00	

Polished, regular goods.....75@75&10%
Acme Fry Pans.....66⅔&%

Dust—

Steel Edge, No. 1.....₩ doz $1.75

Roasting and Baking—

Columbia, S. S. & Co.: Nos. 10, $2: 20, $2.25; 30, $2.50 each.....60&10%

Paper and Cloth—

Sand and Emery—

List April 19, 1886.... 50&10@50&10&10%
Sibley's Emery and Crocus Cloth.....30%

Parers—

Apple—

Advance.....₩ doz $4.75
Baldwin.....₩ doz 5.25
Bonanza.....each 5.00
Daisy.....₩ doz 4.00
Dandy.....each 7.50
Eclipse.....₩ doz 4.25
Eureka, 1888.....each 16.00
Family Bay State.....₩ doz 12.00
Favorite.....₩ doz 5.00
Gold Medal.....₩ doz 4.00
Ideal.....₩ doz 4.00
Improved Bay State....₩ doz 27.00@30.00
Little Star.....₩ doz 4.50
Monarch.....₩ doz 18.50
New Lightning.....₩ doz 5.50
Oriole.....₩ doz 4.00
Penn.....₩ doz 4.00
Perfection.....₩ doz 4.00
Pomona.....₩ doz 4.00
Rocking Table.....₩ doz 6.00
Turn Table.....₩ doz 4.50
Victor.....₩ doz 13.50
Waverly.....₩ doz 4.00
White Mountain.....₩ doz 4.00
72.....₩ doz 4.25
78.....₩ doz 7.00

Potato—

White Mountain.....₩ doz $4.50
Antrim Combination.....₩ doz $5.50
Hoosier.....₩ doz $13.50
Saratoga.....₩ doz $5.50

Pencils—

Faber's Carpenters'.....high list 50%
Faber's Round Gilt.....₩ gro $5.25
Dixon's Lead.....₩ gro $4.50
Dixon's Lumber.....₩ gro $6.75
Dixon's Carpenters'.....10%

Pencils, Soapstone—

See *Crayons.*

Pickers, Fruit—

Prize Fruit Pickers.....50%

Picks—

Railroad or Adze Eye, 5 to 6, $12.00; 6 to 7, $13.00.....60&10@60&10&10%

Picture Nails—

See *Nails, Picture.*

Pinking Irons—

See *Irons, Pinking.*

Pins—

Bow—

Humason, Beckley & Co.'s.....60&10%
Sargent & Co.'s, $17 and $18.....60&10%
Peck, Stow & W. Co....50&10@50&10&5%

Curtain—

Silvered Glass.....net
White Enamel.....net

Escutcheon—

Iron, list Nov. 11, 1885..50&10@50&10&5%
Brass.....60@60&5%

Pipe, Wrought Iron—

List April 13, 1893.

1¼ and under, Plain.....57½&10%
1¼ and under, Galv.....50&10%
1½ and over, Plain.....67½&10%
1½ and over, Galv.....57½&10%
Boiler Tubes, list Oct. 24, 1892.....65&10%
Casing, list Nov. 16, 1892.....52½&10%
Inserted Joints Casing, list Nov. 16, 1892.....47½&5%
Steel Boiler Tubes.....27½&5%
Cold Drawn Seamless Steel Tubing...50%

Planes and Plane Irons—

Wood Planes—

Molding.....40@40&10%
Bench, First quality.....45@45&10%
Bench, Second quality.....50@50&10%
Bailey's (Stanley R. & L. Co.) ..50&10%

Iron Planes—

Bailey's (Stanley R. & L. Co.).....50&10%
Miscellaneous Planes (Stanley R. & L. Co.).....25&10%
Steers' Iron Planes.....50@50&5%
Meriden Mal. Iron Co.'s.....50@50&5%
Davis' Iron Planes.....50@50&5%
Birmingham Plane Co.....60@60&5%
Gage Tool Co.'s Self-Setting...20&10&10%
Chaplin's Iron Planes.....50@50&5%
Sargent's.....60@60&10%
Standard Tool Co.....50@50&5%

Plane Irons—

Butcher's.....$5.00@$5.25 to 4
Buck Bros.....50%

Auburn Thistle, Ohio, Sandusky } ....30&10%
L. & I. J. White.....35%
Stanley R. & L. Co.....50&10%

Plates—

Felloe.....₩ ℔ 6¢@6½¢

Pliers and Nippers—

Button's Patent.....60%
Hall's No. 2, 5 in., $13.50; No. 4, 7 in., $21.00 ₩ doz.....40%
Humason & Beckley Mfg. Co..50@50&10%
Lindsay's Giant.....33⅓%
Gas Pliers.....60%
Gas Pliers, Custar's Nickel Plated..60&5%
Eureka Pliers and Nippers.....40%
Russell's Parallel.....25%
P., S. & W. Cast Steel.....50%
P., S. & W. Tinners' Cutting Nippers, add 6%.....10%
Carew's Pat. Wire Cutters.....20%
Morrill's Parallel, ₩ doz, $12.00....30&5%
Cronk's 8 in., $15.00; 10 in.....$20
Cronk's Button Pattern.....60&10@60%
Cronk's Carrier Pliers.....60@60&5%

Plumbs and Levels—

Regular List.....75&10@75&10&5%
Stanley's Duplex.....20&10%
Stanley's Handy.....20&10%
Disston's.....50%
Cook's.....40&10%
Pocket Levels.....70&10@70&10&10%
Davis Iron Levels.....40&10%

Poachers, Egg—

Buffalo Steam Egg Poachers, ₩ doz, No. 1, $6.00; No. 2, $9.00.....33⅓&%
Silver & Co., 6-Ring, ₩ doz, $4.00; 8-Ring.....$2.00

Pokes, Animal—

Bishop s I. X. L.....₩ doz $6.00
Bishop's Monarch.....₩ doz $4.50
Bishop's Pioneer.....₩ doz $4.00
Bishop's American.....₩ doz $3.00
Eagle, Double Stale.....₩ doz $5.75
Eagle, Single Stale.....₩ doz $3.75
Buckeye, Single Stale.....₩ doz $2.75
Bolding.....₩ doz $6.00
Metallic Horse Poke.....₩ doz., $6.00

Police Goods—

R. I. Tool Co., Handcuffs, $15.00 ₩ doz 10%
R. I. Tool Co., Leg Irons, $25.00 ₩ doz 10%
Tower's.....25%
Daley's Improved Handcuffs; 2 Hands, Polished, ₩ doz, $48.00; Nickeled, $57.00: 3 bands, Polished, ₩ doz, $72.00; Nickeled, $84.00.....25%
J. P. Lovell's Police Goods.....25%

Polish—

Metal—

Prestoline.....30%
Prestoline Paste.....33⅓%
Gaston's Silver Compound.....33⅓%

Stove—

Joseph Dixon's.....₩ gro, $6.00, 10%
Gem.....₩ gro, $4.50, 10%
Gold Medal.....₩ gro, $6.00, 25%
Lustro.....₩ gro, $4.75
Ruby.....₩ gro, $3.75
Rising Sun, 5 gro lots.....₩ gro $5.50
Dixon's Plumbago.....₩ ℔ 8¢
Boynton's Noon Day.....₩ gro $13.00
Parlor Pride Stove Enamel, ₩ gro
Yates' Liquid, 2 3 5 10 gal
₩ gal...$0.80 .70 .60 .50
Yates Standard Paste Polish, 10 ℔ cans, ₩ ℔ 12½¢
Jet Black.....₩ gro $3.50
Japanese.....₩ gro $3.50
Fireside.....₩ gro $2.50
Diamond O. K. Enamel.....₩ gro $19.00
Bonnell's Liquid Stove Polish, ₩ gro $9.00
Bonnell's Paste Stove Polish, ₩ gro $6.00
Black Eagle Benzine Paste, 5 and 10 ℔ cans.....12½¢
Black Jack Water Paste, 5 and 10 ℔ cans.....12½¢
Nickel Plate Paste.....₩ gro $6.00
Crown Paste.....₩ gro $7.20
Crown Paste in 5 and 10 ℔ pails, ₩ ℔ 12¢
Black Flag.....₩ gro $7.20
Black Flag, 5 and 10 ℔ pails.....₩ ℔ 12¢
Black Flag, liquid, in bottles, ₩ gro $8.00
Diamond Rock Nickel Cleaner. ₩ gro $10.20
Raven Liquid, 6 oz. bottles... ₩ gro $8.00
Raven Liquid, 8 oz. bottles.. ₩ gro $9.00
Raven Water Polish, large boxes.. ₩ gro $7.20
Raven Paste (6 pails), ₩ ℔.....10¢

Poppers, Corn—

Round or Square,
1 qt.....₩ doz $1.00; ₩ gr $8.00
1½ qt.....₩ doz $1.00; ₩ gr $9.00
2 qt.....₩ doz $1.50; ₩ gr $14.00

Post Hole and Tree Augers and Diggers—

See *Diggers, Post Hole, &c.*

Potato Parers—

See *Parers, Potato.*

Pots—

Glue—

Tinned.....40&10@40&10&5%
Enameled.....40&10@40&10&5%
Family, Howe's "Eureka".....40%
Family, L. F. C.'s "Handy".....50%

Powder—

In Canisters—

Fine Sporting, 1 ℔ each	0.90
Duck, 1 ℔ each	.60
Rifle, 1 ℔ each	.30
Rifle, ½ ℔ each	.18

In Kegs—

Rifle, 25-℔ kegs.....$3.50
Rifle, 12½-℔ kegs..... 2.00
Rifle, 6¼-℔ kegs..... 1.15
Duck, 25-℔ kegs..... 11.00
Duck, 12½-℔ kegs..... 5.75
Duck 6¼ ℔ kegs..... 3.00

Presses—

Fruit and Jelly—

Enterprise Mfg. Co.....25%
Xenia.....₩ doz $3.50
Shepard's Queen City.....40%
Silver & Co.....₩ doz $2.75

Pruning Hooks and Shears—See *Shears.*

Pullers, Nail—

Scranton.. ....℔ doz., $18.00, 33⅓%
Curtis Hammer....℔ doz., $9.00
Giant, No. 1....℔ doz., $18.00, 10%
Giant, No. 2....℔ doz., $15.00, 10%
Pelican....℔ doz., $9.00, 25%
Eclipse....Each, $2.00, net
Economy....℔ doz., $6.00

Pulleys—

Hot House. Awning, &c....66⅔@70%
Japanned Screw....60&10&10%
Brass Screw....70%
Japanned Side....60&10&10%
Moore's Side, Anti Friction....50%
Moore's Ceiling or End, Anti-Friction 40%
Moore's Dumb Waiter, Anti-Friction 50%
Moore's Electric Light....33⅓%
Japanned Clothes Line....60&10%
Hay Fork, Solid Eye, $4.00; Swivel, $4.50....50&10@50&10&5%
Hay Fork, "Anti-Friction," 5 in. solid, $5.70....50%
Hay Fork, "F" Common and Patent Bushed....20%
Hay Fork, Tarbox Pat. Iron....20%
Hay Fork, Reed's Self-Lubricating....60%
Hay Fork, Moore's Anti-Friction 5 in. Wheel, ℔ doz., $12.00....40%
Shade Rack....45%
Tackle Blocks—See Blocks.
Shepard's Niagara, No. 25..℔ doz 23¢ net
Sash (Auger Mortise).
Common Sense....60%
Empire....60%
Ideal, Nos. 2, 4, 10 & 15 / Acme / Star } 30% less 1¢ ℔ doz net.
On bbl. lots extra 5%.
Ideal, Nos. 25 and 55. ..℔ doz. 22¢ net.

Pumps—

Cistern, Best Makers.... .60@60&10%
Pitcher Spout, Best Makers....67½@70%
Pitcher Spout, Cheaper G'ds..75@75&10%

Punches—

Saddler's or Drive, good..℔ doz., 60@65%
Bemis & Call Co.'s Cast Steel Drive.50&5%
Bemis & Call Co.'s Springfield Socket..65%
Spring, good quality..℔ doz., $2.50@$2.60
Spring, Leach's Pat 15%
Bemis & Call Co.'s Spring....50&5%
Bemis & Call Co.'s Check....55%
Solid Tinners', P., S. & W. Co., ℔ doz., $1.44....55%
Tinners' Hollow Punches, P., S. & W. Co....20&2%
Rice Hand Punches....15%
Avery's Revolving....40%
Avery's Sawset and Punch—See Sawsets
Niagara Hollow Punches....20&2%
Niagara Solid Punches....55%

Rail—

Sliding Door, Wr't Brass....℔ ft., 35¢, 40%
Sliding Door, Bronzed Wr't Iron..℔ ft., 7¢
Sliding Door, Iron, Painted..℔ ft., 4¢, 40%
Barn Door, Light..In. ½ ⅝ ¾
Per 100 feet....$2.00 2.50 3.10, 10%
B. D. for N. E. Hangers—
Small. Med. Large.
Per 100 feet....$3.15 2.70 3.25 Net
Terry's Steel Rail....℔ ft., 4½¢
Victor Track Rail, 7¢ ℔ foot....50&2%
Carrier, double braced, Steel Rail, ℔ foot....3½@4¢
Lundy Parlor Door, Planed Edge, ℔ ft.7¢
Moore's Steel Rail....25&10%
Moody Steel Rail ℔ ft., 5¢....45%

Rakes—

Cast Steel, Association g'ds..70@70&5&2%
Cast Steel, outside g'ds,....70@70&5&2%
Malleable....70@70&5%
Gibbs' Lawn Rake....℔ doz., $4.90
Gibbs' Canton Lawn Rake...℔ doz., $3.75
Gibbs' Acme Lawn Rake....℔ doz., $4.75
Gibbs' Favorite Lawn Rake.℔ doz., $3.90
Gibbs' Crown Lawn Rake, No. 1....℔ doz., $4.90; No. 2, $5.40
Oneida Lawn Rake....℔ doz., $6.00
Fort Madison Prize Bow Brace and Peerless....65%
Fort Madison Steel Tooth Lawn Rake, $6.00....25%

Razors—

J. R. Torrey Razor Co....20%
Wostenholm and Butcher, $10 to £....10%
Jordan's AAAI, new list....Net
Jordan's Old Faithful, new list....Net
Galvanic....℔ doz., $15.00
Electric Cutlery Co....Net
Campbell Cutlery Co....50%

Razor Strops—

See *Strops, Razor.*

Registers —

Moore's Japanned....75%
Moore's Electroplated....75%
Moore's Bronze Finishes....70%
Moore's Solid Bronze....65%
Moore's Stove Pipe....33⅓%

Rings and Ringers—

Bull Rings—

Union Nut Co....55%
Sargent's....75&10%
Hotchkiss' low list....30%
Humason, Beckley & Co.'s....70&10%
Peck, Stow & W. Co.'s..50&10@50&10&10%
Ellrich Hdw. Co., White Metal, low list. 50@50&10%

Hog—

Top of the Hill Ringers....℔ doz $2.00
Top of the Hill Rings....℔ doz $1.25
Hill's Improved Ringers....℔ doz $1.25
Hill's Old Style Ringers....℔ doz $1.12½
Hill's Tongs....℔ doz $3.00
Hill's Rings....℔ doz bxs $1.00
Perfect Rings....℔ doz bxs $1.50
Perfect Ringers....℔ doz $2.15@$2.25
Blair's Hog Ringers....℔ doz $2.00
Blair's Hog Rings....℔ doz 90@$1.00
Champion Ringers....℔ doz $2.00
Champion Rings, Double....℔ doz $2.25
Brown's Ringers....℔ doz $2.00
Brown's Rings....℔ doz $1.15@$1.25
Electric Hog Rings....℔ doz boxes $1.50
Electric Hog Ringers....℔ doz $2.00
Major Rings....℔ doz $1.25
Major Ringers....℔ doz $2.00

Rivets and Burrs—

Norway Iron. list Nov. 17, '87....60&10%
Second quality....70%
Copper....60@60&10%
Coppered Iron, Bettina Brand....50&5%

Rivet Sets—See *Sets.*

Roasting and Baking Pans—See *Pans, Roasting and Baking.*

Rods—

Stair, Brass....25@30%
Stair, Black Walnut....℔ doz 40¢

Rollers—

Barn Door, Sargent's list. ....60&10&10%
Acme Moore's Anti-Friction....55%
Union Barn Door Roller.... ....70%
Moore's Barn Door Stay.... ....50%
Thompson Mfg. Co.'s Lawn Rollers ..30%

Rope—The following prices are f.o.b., New York or factory, and are shaded ½¢@½¢ on large lots; terms, 1½% for cash.

Manila, 7-16 in. diam. and larger℔ ℔ 9½¢
Manila....⅜ in. ℔ ℔ 10 ¢
Manila....¼ and 5-16 in. ℔ ℔ 10½¢
Manila, Tarred Rope....℔ ℔ 9 ¢
Manila, Hay Rope....℔ ℔ 9 ¢
Sisal....7-16 inch and larger ℔ ℔ 7¾¢
Sisal....⅜ in. ℔ ℔ 8¼¢
Sisal....¼ and 5-16 in. ℔ ℔ 8¾¢
Sisal, Hay Rope....℔ ℔ 7¾¢
Sisal, Tarred Rope....℔ ℔ 7¼¢
Sisal, Medium Lath Yarn....℔ ℔ 7¼¢
New Zealand..7-16 in. & larger ℔ ℔ 7¼¢
New Zealand....⅜ inch, ℔ ℔ 7¾¢
New Zealand....¼ and 5-16 inch, ℔ ℔ 8¼¢
New Zealand, Hay Rope....℔ ℔ 7¼¢
New Zealand, Tarred Rope....℔ ℔ 6¾¢
Cotton Rope....℔ ℔ 13½@16¢
Jute Rope....℔ ℔ 6½@7¢

Wire—

List February, 1892. All kinds....45%

Rules—

Boxwood....80&10&10@80&10&10&10%
Ivory....50&10%
Starrett's Steel Rules and Straight Edges....25&10%

Sad Irons—See *Irons, Sad.*

Sand and Emery Paper and Cloth—

See *Paper and Cloth.*

Sash Cord—See *Cord, Sash.*

Sash Locks—*See Locks, Sash.*

Sash Weights—

See *Weights, Sash.*

Sausage Stuffers or Fillers—See *Stuffers or Fillers, Sausage.*

Saws—

Disston's Circular....45@45&5%
Disston's Cross Cut, list Jan. 1,'93.40&10%
Disston's Hand....25%
Woodrough & McParlin, Hand, Panel and Rip....25&10%
Cross Cuts, list Jan. 1, 1893....45&10%
Wheeler, Madden & Clemson Mfg. Co. Hand, Panel and Rip....30&10%
Cross Cuts, list Jan. 1, 1893....45&10%
Atkins' Circular....50&10%
Atkins' Cross Cuts, new list....40%
Atkins' Mulay, Mill and Drag....50&10%
Atkins' One-Man Saw....40%
Atkins' Wood Saws....40%
Peace Circular and Mill....45@45&5%
Peace Hand Panel and Rip....25@25&5%
Peace Cross Cuts, list Jan. 1,'93...45&10%
Richardson's Circular and Mill.45@45&5%
Richardson's X Cuts, list Jan.1,'93.45&10%
Richardson's Hand, &c ....25@25&5%
C E. Jennings & Co.'s brand.... ....25%

Hack Saws—

Griffin's, complete....40&10@50
Griffin's Hack Saw Blades....40&10@50
Star Hack Saws and Blades....25%
Eureka and Crescent....25%

Scroll—

Lester, complete, $10.00....25%
Rogers, complete, $4.00....25%
Barnes' Builders' and Cab Makers'$15,25%
Barnes' Scroll Saw Blades....35%

Saw Frames—

See *Frames, Saw.*

Saw Sets—See *Sets, Saw.*

Saw Tools—See *Tools, Saw.*

Scales—

Hatch, Counter, No. 171, good quality, ℔ doz $18.00@$19.00
Hatch, Tea, No. 161....℔ doz $6.50@$7.00
Union Platform, Plain....$2.10@2.20
Union Platform, Striped....$2.40@2.50
Chatillon's Grocers' Trip Scales....50%
Chatillon's Eureka....25%
Chatillon's Favorite....40%
Family, Turnbulls....30@30&10
Riehle Bros.' Platform....40%

Scale Beams—

See *Beams, Scale.*

Scissors, Fluting....45%

Scrapers—

Adjustable Box Scraper (S. R. & L. Co.) $6.00....30&10%
Box, 1 Handle....℔ doz $2.25@$2.50
Box, 2 Handle....℔ doz $3.00@$3.25
Defiance Box and Ship.... ....20&10%
Foot....50&10&60%
Ship, Common.... ....℔ doz $3.50 net
Ship, R. I. Tool Co....10%

Screen Window and Door Frames—See *Frames*

Screw Drivers—

See *Drivers, Screw*

Screws—

Bench and Hand—

Bench, Iron....55&10@55&10&10%
Bench, Wood, Beech.... ....℔ doz $2.25
Bench, Wood, Hickory....20&10%
Hand, Wood....25&10@25&10&5%
Hand, Grand Rapids, list....35%

Coach, Lag and Hand-Rail—

Lag, Blunt Point, list Jan. 1, 1890....80@80&10%
Coach and Lag, Gimlet Point, list Jan. 1, 1890....80@80&5%
Hand Rail, Sargent's....70&10%
Hand Rail, H. & B. Mfg. Co....70&10@75%
Hand Rail, Am. Screw Co....75%

Jack Screws—

Jack Screws, Millers Falls list.50@50&10%
Jack Screws, P., S. & W....35%
Jack Screws, Sargent....70%
Jack Screws, Stearns'....40@40&10%

Cork—

Humason & Beckley Mfg. Co..40&10@50%
Williamson's....33⅓@33⅓&5%
Detroit Cork Screw Co....33⅓%

Machine—

Flat Head Iron....65%
Round Head Iron....60%

Wood—

List January 1, 1891.
Flat Head Iron....70%
Round Head Iron....65%
Flat Head Brass....70%
Round Head Brass....65%
Flat Head Bronze....70%
Round Head, Bronze....65%
} Extra 10 or 10& 10%often given.
Rogers' Drive Screws....82½%

Scroll Saws—See *Saws, Scroll.*

Scythes—

Grain....40&5@40&10%
Grass....40&10&50%

Scythe Snaths—

See *Snaths, Scythe.*

Sets—

Awl and Tool—

Aiken's Sets, Awls and Tools, No. 20, ℔ doz$10.00....60@60&5%
Fray's Adj. Tool Hdls., Nos. 1, $12; 2, $18; 3, $12; 4, $9....45%
Millers Falls Adj. Tool Hdls., Nos. 1, $12; 2, $18....25%
Henry's Combination Haft...℔ doz $6.50
Stanley's Excelsior: No. 1, $7.50; No. 2, $4.00; No. 3, $5.50....30&10%
Common Brad Sets, No. 42, $10.50; No. 43, $12.50...70&10&5%

Nail—

Square....℔ gr. $4.00@$4.25
Round....℔ gr. $3.25
Buck Bros....27½%
Cannon's Diamond Point...℔ gr. $12, 20%

Rivet—

Regular list....70%

Saw—

Stillman's Genuine....℔ doz $5.00@7.75, 40&5%
Stillman's Pattern, Hand, ℔ doz $3.25; Cross Cut, $6.50....55@55&10%
Common Lever....℔ doz $2.00, 40@50%
Morrill's No. 1, $14.00....40&20%
No. 11, $15.50....40&20%
Nos. 3 and 4, Cross Cut, $22.50...40&20%
No. 5, Mill, $30.00....40&20%
No. 10, $15.00....40&20%
Leach's..No. 0, $8.00; No. 1, $15...16@20%
Nash's....20&10@20&10&10
Hammer, Hotchkiss....$5.50, 10%
Hammer, Bemis & Call Co.'s new Pat.45%
Bemis & Call Spring Hammer.... 30&5%
Bemis & Call Co.'s Plate....20%
Bemis & Call Co.'s Cross Cut.... ....30&5%
Aiken's Genuine....$13.00, 55@55&10%
Aiken's Imitation....$9.00, 55@55&10%
Hart's Pat. Lever....20%
Disston's Star.... ....25%
Leopold.... ....40&10@50%
Atkin's Lever....℔ doz No. 1, $6.00
Atkin's Criterion....℔ doz No. 1, $6.00
Croissant (Keller), No. 1, $15.00; No. 2, $24.00....40&10@50%
Avery's Saw Set and Punch....50%
Kohler's Royal....℔ doz $7.00
Kohler's Giant Royal....℔ doz $12.00
Crescent....℔ doz $3.00
Lloyd's Acme....℔ doz $15, 40&10%
Taintor Positive....℔ doz $18, 50%

Sharpeners, Knife—

Larkins'.
Applewood Handles...℔ doz. $6.00, 40%
Rosewood or Cocobola. ℔ doz. $9.00 40%

Shaves, Spoke—

Iron....45%
Wood....30%
Bailey's (Stanley R. & L. Co.)....40&10%
Stearns'....30&10%
Cincinnati....25&10%
Goodell's ℔ doz. $9.00....25%

Shears—

American (Cast) Iron..75&10@75&10&5%
Barnard's Lamp Trimmers..℔ doz. $3.75
Seymour's, List Dec. 1881. 60&10&10@60&10&10&5%
Heinisch's, List Dec. 1881. 60&10&10@60&10&10&5
Heinisch's Tailor's Shears....33⅓%
Cast Steel Trimmers: First quality.... 80@80&10%
Second quality....80&10@80&10&10%
Acme Cast Shears....10&10%
Diamond Cast Shears....10%
Clipper....10&10%
Victor Cast Shears....75&10@75&10&5%
Howe Bros. & Hulbert, Solid Forged Steel....40%
Hatch Cutlery Co., Solid Steel Forged.60%
Davenport Cutlery Co....60@60&10%
Clauss brand, Japanned....70%
Clauss brand, Nickeled, same list....60%
Galvanic 3½ to 9 in., ℔ doz. $1.00 ℔ inch
Electric Cutlery Co....Net
Campbell Cutlery Co., Jap'd....75%
Nickel Plated....65%

Tinners' Snips—

Wrt. Handles, Steel Blades, ..20@20&10%
Niagara Snips and Shears. ...20&10%
Cast Handles, Laid with Steel 40%

Pruning Shears and Hook—

Disston's Combined Pruning Hook and Saw....℔ doz. $18.00, 20&10%
Disston's Pruning Hook, ℔ dos. $12.00 20&10%
E.S.Lee & Co.'s Pruning Tools.50&10@70%
Pruning Shears, Henry's Pat., ℔ doz. $3.75@$4.00
Henry's Pruning Shears, ℔ doz. $4.25 @$4.5...
Wheeler, M. & C. Co., Combination, ℔ doz $12.00
Dunlap's Saw and Chisel, ℔ doz $8.50,30%
J. Mallinson & Co., No. 1, $5.25; No. 2, $7.25
P., S. & W. Co....60%
Levin Pruner No. 1, $15.00 ℔ doz ..40&3%
Levin Pruner No. 2, $21.00 ℔ doz...40&3%

Tinners', &c.—

Shears and Snips (P. S. & W.)....20@25%
Snips, J. Mallinson & Co....33⅓%

Sheaves—

Sliding Door—

M. W. Co., list July, 1888....50&10@60&5%
R. & E., list Dec. 18, 1885....55&20%
Corbin's list....60&10&2%
Patent Roller....60&10&2%
Patent Roller, Hatfield's....75%
Russell's Anti-Friction, list Dec. 18, 1885....60&3%
Moore's Anti-Friction....50%

Sliding Shutter—

R. & E., list Dec. 18, 1885....60&10&2%
Sargent's list....70%
Reading list....60&10&10%

Shells—

First quality 4, 8, 10 and 12 gauge 25&10&2%
First quality Rival, Club and Climax brands, 14, 16 and 20 gauge ($7.50 list)....20&10&2%
Prize....40&3%
Star, Club, Rival and Climax Brands... 33⅓&10&2%
Smokeless brand, 12, 10, 16 gauge, 33⅓&10&2%
Trap brand, 12 and 10 gauge..33⅓&10&2%
Selbold's Comb. Shot Shells....15&2%
Brass Shot Shells, 1st quality....60&2%
Brass Shot Shells, Club, Rival, Climax 65&3%

Shells, Loaded—

Standard List, July 19, 1890....40&10&10@40&10&10&3%

Ship Tools—

L. & I. J. White....20&5%

Shoes, Horse, Mule, &c.—

Horse—

Burden's, Perkins', Phœnix, Standard, Diamond State, Bryden's Boss and Crescent, at factory....$4.00
Bryden's Frog Pressure, at factory..$5.00

Mule—

Add $1 ℔ keg to above prices.

Ox Wrought—

Ton lots....℔ ℔ 9¢
1000 ℔ lots....℔ ℔ 9½¢
500 ℔ lots....℔ ℔ 10¢

Shot—

	Small lots.	
Drop, up to B, 25-℔ bag	$1.45	In ton lots, 25¢ discount of 5¢ ℔ bag (2½ cts made).
Drop, up to B, 5-℔ bag	.35	
Drop, B and larger, 25-℔ bag	1.70	
Drop, B and larger, 5-℔ bag	.40	
Buck and Chilled, 25-℔ bag	1.70	
Buck and Chilled, 5-℔ bag	.40	
Dust Shot, 25-℔ bag	2.00	
Dust Shot, 5-℔ bag	.45	

Shovels and Spades—

Ames' Shovels, Spades, &c., list Nov. 1, 1885....30%
NOTE.—Jobbers frequently give 5@7½% extra on above.
Griffith's Black Iron....50&10%
Griffith's C. S ....60@60&5%
Griffith's Solid C. S. R. R. Goods....20%
St. Louis Shovel Co....20@20&7½%
Hussey, Binns & Co....15@25%
Hubbard & Co.... ....20@20&7½%
Lehigh Mfg. Co....50&10%
H. M. Myers Co....30%
Payne Pettebone & Son....33⅓&5%
Remington's (Lowman's Pat.)40&10@50%
Rowland's Black Iron..50&10@50&10&5%
Rowland's Steel.... ....60&5@60&10%
Terra Haute Shovel & 25%

Shovels and Tongs—

Iron Head....60&10@60&10&5%
Brass Head.... ....60&10&10%

Sieves and Sifters—

Mann's Tin Rim....50&25%
Buffalo Metallic, S. S. & Co....50&25%
Shaker (Barler's Pat.) Flour Sifters ℔ gr $21.00
Electric Light..℔ doz $1.50; ℔ gro $15.00
A. & W. Sifters....℔ gr $15.00
Hunter's Genuine, ℔ doz $1.75, ℔ gr $16.50
Hunter's Imitation....℔ doz $1.75; ℔ gr $15.00

Sieves, Wooden Rim

	Iron	Plated
Mesh 18, Nested, ℔ dos.	$0.80	$1.00
Mesh 20, Nested, ℔ doz.	.95	1.10
Mesh 24, Nested, ℔ doz.	1.15	1.30

Sinks, Wrought Steel—

Columbus, Painted or Unpainted.... 50@30&10%
Columbus, Galvanized and Enameled. 60@50&10%
New Era, Painted....40&10@50&5%
New Era, Galvanized and Enameled... 60&10&10@70&5%

Skeins, Thimble—

Western list....75&5@75&10%
Columbus Wrt. Steel, Special net prices
Coldbrookdale Iron Co....60%
Seneca Falls Pattern....60%
Utica P. S. T. Skeins....60%
Utica Turned and Fitted....35%

Slates—

School, by case....50&10@50&10&10%

Slaw Cutters—See *Cutters.*

Sleds Hand—

Tubular Steel....℔ doz $24.00 40&50
Lots of 6 dos 50%

Snaps, Harness, &c.—

Anchor (T. & S. Mfg. Co.).....65%
Fitch's (Bristol).....50&10%
Hotchkiss.....10%
Andrews.....50%
Sargent's Patent Guarded.....70&10&10%
German, new list.....40&10%
Covert.....50&10&5&2%
Covert, New Patent.....50&10&5&2%
Covert, New R. F.....60&10&5&2%
Covered Spring.....60&10&10%
Covert's Saddlery Works' Triumph 33⅓%
John Protz Snaps.....75@75&5%
Kelley & Woolworth's Steel Harness.....50&10@60%

Snaths—

Scythe.....50&2@50&5&2%

Soldering Irons—

See *Irons, Soldering.*

Spittoons, Cuspidors, &c.

Standard Fiberware—

Cuspidors, 8½-inch, ₩ doz., No. 5, $8; No. 5X, $9.
Spittoons, Daisy, 8-inch, No. 1, 4; 10 and 11 inch, $6.

Spoke Shaves—

See *Shaves, Spoke.*

Spoke Trimmers—

See *Trimmers, Spoke.*

Spoons and Forks—

Tinned Iron—

Basting, Cen. Stamp. Co.'s list.....70&10%
Solid Table and Tea, Cen. Stamp. Co.'s list.....70&10%
Buffalo, S. S. & Co.....33½&2%

Silver Plated—

4 months or 5% cash 30 days:
Meriden Brit. Co., Rogers.....40&15%
C. Rogers & Bros.....40&15%
Rogers & Bros.....40&15%
Reed & Barton.....40@40&5%
Wm. Rogers Mfg. Co.....40, 15&5%
Simpson, Hall, Miller & Co.....40, 15&5%
Holmes & Edwards Silver Co.....40, 15&5%
L. Boardman & Son.....50&12½%

Miscellaneous—

Holmes & Edwards Silver Co.:
No. 67 Mexican Silver.....50&10&5%
No. 30 Silver Metal.....50&10&5%
No. 24 German Silver.....50&10&5%
No. 50 Nickel Silver.....50&5%
No. 49 Nickel Silver.....50&10&5%
Wm. Rogers Mfg. Co.:
Rogers' Silver Metal.....50&10&6%
18% Rogers' German Silver.....60&8%
22% Rogers' Nickel Silver.....50&6%
German Silver.....50@50&5%
German Silver, Hall & Elton..50&5% cash
Nickel Silver.....50&5@50&10&5% cash
Brittannia.....60@60&5%
Boardman's Nickel Silver, list July 1, 1891.....60&7½&5%
Boardman's Brittannia Spoons, case lots.....60&5% cash

Springs—

Door—

Torrey's Rod, 39 in.....₩ doz $1.20@1.2
Warner's No. 1, ₩ doz $1.50; No. 2, $3.40.....55@55&10%
Gem (Coil), list April 19, 1886.....20%
Star (Coil), list April 19, 1886.....20&10%
Victor (Coil).....60&10@60&10&5%
Champion (Coil).....60&10@60&10&10%
Cowell's, No. 1, ₩ doz $18.00; No. 2, $15.00.....50@50&10%
Rubber, complete, ₩ doz $4.50.....55&10%
Hercules.....50@50&10%
Phœnix.....33⅓&%

Carriage, Wagon, &c.—

Elliptic, Concord, Platform and Half Scroll.....60&10@60&10&10&10 or net prices
Cliff's Bolster Springs.....25%

Squares—

Steel and Iron, Nickel-Plated.....80&10&10@80&25%
Try Square and T Bevels.....60&10&10%
Disston's Try Square and T Bevels.....50%
Winterbottom's Try and Miter.....30&10%
Starrett's Micrometer Caliper Squares.....25%
Avery's Flush Bevel Squares.....40%
Avery's Bevel Protractor.....50%

Squeezers—

Fodder—

Blair's.....₩ doz $2.00
Blair's "Climax".....₩ doz $1.25

Lemon—

Porcelain Lined, No. 1....₩ doz $6.00.....25&30%
Wood, No. 2.....₩ doz $3.00, 35%
Wood, Common.....₩ doz $1.70@1.75
Dunlap's Improved.....₩ doz $3.75, 20%
Sammis....No. 1, $5.00; No. 2, $9; 12, $18 ₩ doz.....25&10%
Jennings' Star.....₩ doz $2.50
The Boss.....₩ doz $2.50
Dean's..Nos. 1, ₩ doz $6.50; 2, $3.35; 3, $1.90; Queen, $2.50
Little Giant.....50@50&5%
Ring.....40&5%
Hotchkiss Straight Flash....₩ doz $12.00
Silver & Co., Glass.....₩ gro. $9.00

Standard Fiber Ware—

See *Ware, Standard Fiber.*

Staples—

Barbed Blind, ½ in. and larger, ₩ ℔ 7@7½¢
Barbed Blind, ¾ in.....₩ ℔ 8@8½¢
Fence Staples, Galvanized. Same price as F'rb Wire
Fence Staples Plain..... See Trd. Rep
Grand Crossing Tack Co.'s list....75&10%

Steelyards—.....40&10@50%

Stocks and Dies—

Blacksmith's:
Waterford Goods.....35%
Butterfield's Goods.....35%
Lightning Screw Plate.....25@30%
Reece's New Screw Plates.....25@30%
Reversible Ratchet.....30%
Gardner.....25%
Green River.....25@30%

Stops, Bench—

Morrill's, ₩ doz., Nos. 1, $9.50 @ 2, $12.00.....40&20%
Hotchkiss's.....₩ doz $5, 10@10&10%
Weston's, No. 1 @ No. 2, $9, 25&10&5%
McGill's, ₩ doz $3.....10%
Cincinnati.....25&10%
Terrell's Nos. 1 and 2, ₩ doz., $3; No. 3, $3.60.....80%
Millers Falls.....25%
Stearns'.....20&10%

Stone—

Stones, Grind—See *Grindstones.*

Scythe Stones—

Pike Mfg. Co., list April, 1892.....33⅓%
Cleveland Stone Co., list Nov. 1892..33⅓%

Oil Stones, &c.—

Pike Mfg. Co.:
Hindostan No. 1, ₩ ℔....8¢
Sand Stone.....5¢
Turkey Oil Stone, 4 to 8 in.....80¢
Turkey Slips.....$2.00
} 40 @ 40& 10%

Lily White Washita.....60¢
Rosy Red Washita.....60¢
Washita Stone, Extra.....50¢
Washita Stone, No. 1.....40¢
Washita Stone, No. 2.....30¢
Lily White Slips.....90¢
Rosy Red Slips.....90¢
Washita Slips, Extra.....80¢
Washita Slips, No. 1.....70¢
Arkansas Stone, No. 1, 3 to 5½ in., $2.80
Arkansas Stone, No. 1 5½ to 8 in., $3.50
} 33⅓@33⅓&10%

Lake Superior.....₩ ℔ 13¢
Lake Superior Slips.....₩ ℔ 20¢

Stove Polish—

See *Polish, Stove.*

Stretchers Carpet—

Cast Steel, Polished.....₩ doz $2.2
Cast Iron, Steel Points.....₩ doz 75@80¢
Socket.....₩ doz $1.75
Bullard's.....25@25&10%

Strops, Razor—

Genuine Emerson.....60@60&5%
Imitation " ..₩ doz $2.00, 20&10&5%
Torrey's.....20%
Badger's Belt and Com.....₩ doz $2.00
Lamont Combination.....₩ doz $4.00
Jordan's Pat. Padded, list Nov. 1, '89, 50%
Electric Cutlery Co.....Net
Campbell Cutlery Co.....Net

Stuffer, Sausage—

Miles' Challenge, ₩ doz $20.....50@50&5%
Perry....₩ doz, No. 1, $15.00; No. 0, $21.00.....50&5@50&10%
Draw Cut No. 4, each $30.00.....20%
Enterprise Mfg. Co., list Jan 17, '93..25%
Silver's.....40&10%

Sweepers, Carpet and Lawn—

Carpet—

Bissell No. 5.....₩ doz $17.00
Bissell No. 8.....₩ doz $20.00
Bissell, Grand.....₩ doz $36.00
Standard.....₩ doz $24.00
Domestic.....₩ doz $21.00
Domestic, No. 2.....₩ doz $22.00
Grand Rapids.....₩ doz $24.00
Crown Jewel, No. 1, $18.00; No. 2, $19.00; No. 3, $20.00
Magic.....₩ doz $15.00
Improved Parlor Queen, Nickeled.....₩ doz $27.00
Japanned.....₩ doz $24.00
Excelsior.....₩ doz $22.00
Garland.....₩ doz $18.00
Parlor Queen.....₩ doz $24.00
Housewife's Delight.....₩ doz $15.00
Ladies' Friend.....₩ doz $15.00
Ladies' Friend No. 2.....₩ doz $16.00
Advance.....₩ doz $18.00
Our Leader.....₩ doz $19.00
Triumph.....₩ doz $20.00
Goshen.....₩ doz $21.00
Supreme.....₩ doz $22.00
Easy.....₩ doz $22.00
Gilt Edge.....₩ doz $24.00
Acme.....₩ doz $26.00
Imperial.....₩ doz $26.00
Grand Republic.....₩ doz $30.00
Banner.....₩ doz $22.00
The Star.....₩ doz $21.00
Reliable.....₩ doz $22.00
The Rapid.....₩ doz $22.00
Our Own.....₩ doz $27.00
Model.....₩ doz $27.00

Goshen Sweeper Company, Grand Rapids, Mich., make the following rebates:
5 dozen in 6 months.....₩ doz $1.00
10 dozen in 6 months.....₩ doz $2.00
25 dozen in 6 months.....₩ doz $3.00
Except on L. F., when 10 dozen price is $13.50, and 25 dozen $13.00.

Lawn—

Thompson Mfg. Co.....30%

Swings—

Davies Lawn.....25%

Tacks, Brads &c.—

List October 19, 1889. Old established straight Weights. Short Weight goods are sold at lower prices.

Carpet Tacks—
American, Blued.....66⅔%
American, Tin'd and Cop'd.....70%
Steel, Bright and Blued.....66⅔%
Steel, Tinned and Coppered.....70%
Swedes Iron, Blued.....72½%
Swedes Iron, Tinned.....75%
American Iron Tacks, Domestic.66⅔%
Swedes Iron Tacks—
S. S., Blued.....66⅔%
S. S., Tinned.....70%
Lanc., Blued.....55%
Lanc., Tinned.....60%
Gimp and Lace Tacks—
S. S., Blued.....62½%
S. S., Tinned.....66⅔%
Lanc., Blued.....55%
Lanc., Tinned.....60%
Basket and Trimmers' Tacks—
Lanc.....52½%
S. S.....55%
Hungarian Nails.....60%
Common and Patent Brads.....55%
Leathered Tacks.....10%
Brush Tacks, S. S.....60%
Looking Glass Tacks, S. S.....35%
Picture-Frame Points, S. S.....35%
Finishing Nails.....60%
Trunk and Clout Nails—
Black.....65%
Tinned or Coppered.....67½%
Basket Nails.....60%
Chair Nails.....52½%
Cigar Box Nails.....45%
Tin Capped Nails.....50%

} Extra discount 25&2½%

Miscellaneous—

Double Point.....90@90&10%
Wire Carpet Nails.....50&10%
Claw Handle Carpet.....₩ gross $4.00
Bonnie Blue.....₩ box 1.50
Bill Nye Brad Box.....4 00
Parisian Gilt Nails, cartoon.....50
Home Tacks, No. 50 ₩ case (12 cartons), $36.00; No. 100, ₩ case (12 cartons), $72.00.
Home Nails, No. 200, ₩ case (12 cartons), $30.00; No. 400, ₩ case (12 cartons), $6 00.
} 50&2%

Upholsterers' Nails.....50&10%

Wire Brads and Nails

Steel-Wire Brads, R. & E. Mfg. Co.'s list.....50&10%
See also *Nails, Wire.*

Tanks, Oil—

Emerald, S. S. & Co.: 30-gal. $8.75; 60-gal., $11 each.....50&10&5%

Tapes, Measuring—

American.....40@40&5%
Spring.....40%
Chesterman's, Regular list.....25@30%

Thermometers—

Tin Case.....80@80&10%

Thimble Skeins—See *Skeins.*

Ties, Bale—Steel.

Standard Wire, list.....50&10&5%

Tinners' Shears, &c —

See *Shears, Tinners' &c.*

Tinware—

Stamped, Japanned and Pieced, list Jan 20, 1887.....70&10@70&25%

Tire Benders, Upsetters, &c.—See *Benders and Upsetters, Tire.*

Tobacco Cutters—

See *Cutters, Tobacco.*

Tools—

Coopers'—

Bradley's.....20%
Barton's.....20@20&5%
L. & I. J. White.....20&5%
Albertson Mfg. Co.....25%
Beatty's.....30%
Sandusky Tool Co.....30@30&5%
Shaves Cincinnati Tool Co.....20%

Lumber—

Ring Peavies, "Blue Line"..₩ doz $20.00
Ring Peavies, Common.....₩ doz $18.00
Steel Socket Peavies.....₩ doz $21.00
Mall. Iron Socket Peavies..₩ doz $19.00
Cant Hooks, "blue Line"....₩ doz $16.00
Cant Hooks, Common Finish..₩ doz $14.00
Cant Hooks, Mall. Socket Clasp, "Blue Line" Finish.....$16.00
Cant Hooks, Mall. Socket Clasp, Common Finish.....₩ doz $14.50
Cant Hooks, Clip Clasp, "Blue Line" Finish.....₩ doz $14.00
Cant Hooks, Clip Clasp, Common Finish.....₩ doz $12.00
Hand Spikes....₩ doz 6 ft., $15.00; 8 ft., $20.00
Pike Poles, Pike & Hook, ₩ doz, 12 ft., $11.50; 14 ft., $12.50; 16 ft., $14.50; 18 ft., $17.50; 20 ft., $21.50.
Pike Poles, Pike only, ₩ doz, 12 ft., $10.00; 14 ft., $11.00; 16 ft., $13.00; 18 ft., $16.00; 20 ft., $20.00.
Pike Poles, not ironed, ₩ doz, 12 ft., $6.00; 14 ft., $7.00; 16 ft., $9.00; 18 ft., $12.00; 20 ft., $16.00.
Setting Poles, ₩ doz, 12 ft., $14.00; 14 ft., $15.00; 16 ft., $17.00.
Swamp Hooks.....₩ doz $18.00

Saw—

Atkins', new list.....40%

Transom Lifters—

See *Lifters, Transom.*

Traps—

Game—

Newhouse.....40@40&5%
Oneida Pattern.....70&10%
Game, Blake's Patent.....40&10&5%

Mouse and Rat—

Mouse Wood, Choker, ₩ doz holes, 9@10¢
Mouse, Round Wire.....₩ doz $1.50 10%
Mouse, Cage, Wire.....₩ doz $2.50 10%
Mouse, Catch-'em-alive..₩ doz $2.50 15%
Mouse, Bonanza.....₩ doz 0.90@$1.00
Rat, Decoy.....₩ gr $10.00, 10%
Ideal.....₩ gr $10.00
Cyclone.....₩ gr $5.25
Hotchkiss Metallic Mouse, 5-hole traps, ₩ doz., 75¢; in full cases, ₩ doz.60@65¢
Hotchkiss Imp. Rat Killer...₩ gro $18.50
Hotchkiss New Rat Killer...₩ gro $16.50
Schuyler's Rat Killer.....₩ gro $15.00
Dandy.....₩ doz.. $1.75
Waddel's Go Bang, ₩ gro.....$12.50

Fly—

Harper, Champion or Paragon.....₩ doz. $1.75, ₩ gro. $16.50
Balloon, Globe or Acme.....₩ doz. $1.50, ₩ gro. $13.50

Triers—

Butter and Cheese.....25%

Trimmers, Spoke—

Bonney's.....₩ doz $10.00, 50%
Stearns'.....20&10%
Ives', No. 1, $15.00; No. 2, $12.00 ₩ doz. 55&10%
Douglas'.....₩ doz $9.00, 20%
Cincinnati.....25%

Trowels—

Lothrop's Brick and Plastering, 20&10&5@35%
Reed's Brick and Plastering.....15%
Disston's Br'k and Plastering.25@25&10%
Peace's Plastering.....25@25&5%
Clement & Maynard's.....20@20&5%
Rose's Brick.....15@20%
Brade's Brick.....25%
Worrall's Brick and Plastering.....20%
Garden.....70%
Cleves' Angle Trowel, ₩ gro, No. 1, $36; No. 2, $30; No. 3, $15. net @ 10%

Trucks, Warehouse, &c.—

B. & L. Block Co.'s list.....40%
Thompson Mfg. Co.....40%
Barnes' Barrel Trucks.....40%

Tubes. Boiler—

See Pipe

Twine—

Flax Twine—

	BC.	B.
No. 9, ¼ and ⅛ ℔ Balls	35¢	31¢
No. 12, ¼ and ⅛ ℔ Balls	32¢	30¢
No. 18, ¼ and ⅛ ℔ Balls	20¢	29¢
No. 24, ¼ and ⅛ ℔ Balls	20¢	29¢
No. 36, ¼ and ⅛ ℔ Balls	18¢	28¢

No. 264 Mattrass, ¼ and ⅛ ℔ Balls, 52@54¢
Chalk Line, Cotton, ⅛ ℔ Balls.....25¢
Mason Line, Linen, ⅛ ℔ Balls.....55¢
2-Ply Hemp, ¼ and ⅛ ℔ Balls (Spring Twine).....15½¢
3-Ply Hemp, 1 ℔ Balls.....16¢@16½¢
3-Ply Hemp, 1½ ℔ Balls.....15¢@15½¢
Cotton Wrapping, 5 Balls to ℔..15¢@16¢
2, 3, 4 and 5 Ply Jute, ⅛ ℔ Balls.....10¢
Wool.....6½¢@6½¢
Paper.....13¢@14¢
Cotton Moss, 6, 9, 12 and 15 ₩ to dos..13¢

Vises—

Solid Box.....50&10@60%

Parallel—

Fisher & Norris Double Screw.....15&10%
Stephens'.....25@30%
Parker's.....20@25%
Wilson's.....50%
Howard's.....40%
Bonney's.....50%
Millers' Falls.....40@40&10%
Trenton.....40&5@40&10%
Merrill's.....15@20%
Hollands'.....35@40%
Sargent's.....70&10%
Backus and Union.....40%
Double Screw Leg.....15&10%
Prentiss.....20@25%
Simpson's Adjustable.....40%
Moore's.....20%
Massey Quick Action.....20@25%

Saw Filers—

Bonney's, Nos. 2 & 3, $15.00.....40&10@50
Stearn's.....33⅓&10@33⅓&10&10%
Stearn's Silent Saw Vises.....33⅓@33⅓
Hopkins'.....₩ doz $17.50, 10%
Reading.....40&10%
Wentworth.....20&10%
Economy, ₩ doz., Nos. 110, $10.00; 120, $15.00.....50&10&10&5%

Miscellaneous—

Phœnix Vises.....33⅓%
Phœnix Hand Vises....₩ doz $3.60, 33⅓%
Cowell Hand Vises.....20%
Bauer's Pipe Vises.....10%
Cincinnati.....25&10%
Enterprise Pipe Vises. ...each $3.00, 40%
Massey Combination Pipe Vise.....40%

Wads—Price Per M.

U.M.C.&W.R.A.—B. E., 11 up..	68¢
U.M.C.&W.R.A.—B. E., 9&10..	82¢
U.M.C.&W.R.A.—B. E., 8	96¢
U.M.C.&W.R.A.—B. E., 7	$1.10
U.M.C.&W.R.A.—P. E., 11 up.	1.15
U.M.C.&W.R.A.—P. E., 9&10..	1.50
U.M.C.&W.R.A.—P. E., 8	1.70
U.M.C.&W.R.A—P. E., 7	1.80
Eley's B. E., 11 and larger	$1.70@$1.75
Eley's P. E., 12 to 20	3.00@ 3.25

Dis. 30&5%

Wagon Boxes—

See *Boxes, Wagon.*

Wagon Jacks—

See *Jacks, Wagon.*

Ware, Hollow—

Cast Iron, Hollow—

Stove Hollow-Ware—
Ground.....60&10@60&10&10%
Unground.....65&10@70&5%
White Enameled Ware—
Maslin Kettles.....70&10@75&5%
Boilers and Saucepans.....60@60&5%
Tinned Boilers and S'pans.....60@60&5%
Rustless Hollow Ware.....50@50&5%
Gray Enameled Ware—
Stove.....50%
Maslin Kettles.....60&10&10%
Boilers and Saucepans.....40&5%

Enameled—

Agate and Granite Ware, list Jan. 1, 1889.....33⅓&10%
Ironclad Enameled Ware....dis 33⅓&10%

Kettles—

Galvanized Tea-Kettles—

Inch	6	7	8	9
Each	55¢	60¢	65¢	75¢

Standard Fiber—

	Per Doz. Plain.	Decorated.
Wash-Basins, 10½ in.	$1.80	2 00
Wash-Basins, 12 in.	2.00	2.50
Keelers, 11¼ in.		3.50
Cuspidors		7.50
Spittoons, "Daisy," 8 in.	3.50	4.00
Peck Measure	3.50	
Half-peck Measure	3.00	

See also Pails.

Indurated Fiber.—

Spittoons No. 2, ₩ doz.....$6.00
Basins, Ringed, ₩ doz., No. 2.....2.80
Washtubs, Nested, Nos. 0, 1, 2 and 3 (4 pieces), ₩ nest.....5.75
Keelers Nested, Nos. 1, 2, 3 and 4 (4 pieces), ₩ nest.....$2.55
Butter Bowls 15, 17 and 19-inch (3 pieces), ₩ nest.....$1.50
Liquid Measures, pt., qt., 2 qt. and funnell (4 pieces), ₩ set.....$1.20

} 25%

See also Pails.

Silver Plated, Hollow—

4 mo. or 5% cash in 30 days.
Reed & Barton.....
Meriden Britannia Co.....
Simpson, Hall, Miller & Co.....
Rogers & Brother.....
} 40&5%

Hartford Silver Plate Co.....
William Rogers Mfg. Co.....
} 40&5&5%

Washers—

Size hole..... 5-16 ⅜ ½ ⅝ to 1¼
Washers..... 5½ 4½ 3½ 2½
In lots less than 200 ℔, ₩ ℔, add ½¢, 5-℔ boxes 1¢ to list.

Washer Cutters—

See *Cutters, Washers.*

Water Coolers—

See *Coolers, Water.*

Wedges—

Iron.....₩ ℔ 3½¢
Steel.....₩ ℔ 3½¢

Weights, Sash—

Solid Eyes.....₩ ton $18.00@$19.00

Well Buckets Galvanized—See *Buckets, Well, Galvanized.*

Wheels Well—

8 in., $2.00 10 in. $2.50 12 in $2.75

Whips

American Whip Co.: Length.	4½	5	5½	6	6½	7	7½	8 ft.
X. L. Whalebone Driving...	$18.00	20.00	22.00	24.00	27.00	30.00	33.00	36.00
Eureka, Two-thirds Whalebone.	....	....	15.00	16.50	18.00	20.00	....	....
Bull Bone, Half-length Whalebone.	....	....	11.00	12.00	13.00	15.00	....	....
American Standard	8.00	8.50	9.50	10.50	12.00	13.50	15.00	16.50
True Grip, Raw Hide Center....	6.00	6.00	6.50	7.00	7.50	9.00	....	....
New Name, Stocked Java, Black and Wine Colors	....	....	....	6.00	...	....	....	....
Americus, 93 Pen Whip	....	....	....	6.00	....	....	....	....
Gents' Light Driving No. 111	....	....	....	6.00	....	....	....	....
Gents' Light Driving No. 106	....	....	....	5.00	....	....	....	....
Hand-made Stocked Java No. 103	....	....	3.75	4.00	....	....	....	....

Per dozen.

A large variety of cheaper grades.....$2.00@$3.00
Team Whips.....$2.00@$7.50
Toy Whips.....₩ gro. $2.50@$12.00
Hardware Assortment, 10/American, 75 Whips for $50.00.

Wire and Wire Goods—

Iron—

Market,

Br. & Ann., Nos. 0 to 18. 75&10@75&10&5%
Cop'd, Nos. 0 to 18. 75&5%
Galv., Nos. 0 to 18..... 70&5@70&10%
Tin'd, Tin'd list, Nos. 0 to 18.....70@70&10%

Extra 5@10% often given and net prices often made on large lots.

Stone,
Br. and Ann'd, Nos. 16 to 18.....80%
Bright and Ann'd, Nos. 19 to 26.....80&5%
Br. and Ann'd, Nos. 27 to 36.....82½&5%
Tinned.....65&10%

Extra 10% often given.

Tinned Broom Wire, 18 to 21, ₩ ℔....4¾¢
Galvanized Fence .....75&10%
Brass, list Jan. 18, 1884.....40&5%
Copper, list Jan. 18, 1884.....40@5%
Annealed Wire on Spools.....60%
Mallin's An'aled & Tin'd on Spools..60&5%
Mallin's Brass and Cop. on Spools...50&5%
Ossawan Mills, An'ld and Tinned on Spools.....60&10%
Ossawan Mills, Brass and Copper on Spools.....50&10%
Tate's Spooled, Tin'd & Annealed..60&5%
Tate's Spooled Cop. and Brass 50%
Cast Steel Wire 50%
Stubs' Steel Wire.....$6.00 to £, 30%
Steel Music Wire, 12 to 30, imported.... 60@70¢ ₩ ℔

Wire Clothes Line, see Lines.
Wire Picture Cord, see Cord.

Bright Wire Goods—

Standard list.....85@85&10%

Wire Cloth and Netting—

Painted Screen Cloth ₩ 100 ft. $1.75@$2.00
Galvanized Wire Netting.....75@75&10%

Wire Barb—

See Trade Report.

Wire Rope—See *Rope, Wire.*

Wrenches—

American Adjustable 40%
Baxter's Adjustable "S".....40&10@50%
Baxter's Diagonal.....60%
Coes' Genuine.....50@50&10%
Coes' "Mechanics'".....50&10&3%
Girard Standard.....65&10@70%
Lamson & Sessions' Engineers'....60&10%
Lamson & Sessions' Standard.....70&10%
P. S. & W. Agricultural.....
Girard Agricultural.....
Lamson & Sessions' Agric'l..
W. & B. Diamond.....

75&10@80%

Bemis & Call's:
Pat. Combination Bright .....40&5%
Pat. Combination Black.....40 & 10%
Merrick's Pattern.....45%
Brigg s Pattern.....30&10%
Cylinder or Gas Pipe.....45&5%
No. 3 Pipe 55%
Aiken's Pocket (Bright).....$6.00, 50&10%
The Favorite Pocket.....₩ doz., $4.00, 40%
Webster's Pat. Combination.....35%
Boardman's.....50%
Always Ready.....35&5%
Alligator.....50%
Donohue's Engineer.....20&10%
Eagle.....50&10%
Acme, Bright.....50&2%
Acme, Nickeled.....40&2%
Hercules.....70@70&5%
Walker's.....55&2%
Diamond Steel.....55&2%
Cincinnati Brace Wrenches.....25&10%
Tafts Vise Wrench.....55&10&2%

Wringers, Clothes—

Am. Wringer Co.'s list, Jan. 2, '93..2% cash
Colby WringerCo., listSept. 1, '91..2% cash
Lovell Mfg. Co., list Jan. 1, 1892..2% cash
Peerless Mfg. Co., list Feb., 1892..2% cash
National Wringer & Mfg. Co., list June 1, 1892.....2% Cash

Wrought Goods—

Staples, Hooks, &c., list March 17, 1892 85&10@85&10&2%

News and Notes.

Mining is depressed in Scotland, the North of England and Yorkshire, a large number of mines being quite idle, and many collieries working short time.

In view of the threatened dearth of fodder in Europe, the French Academy of Sciences recommends utilizing the leaves of the grape vine for this purpose. Cattle eat them, either fresh or dry, with avidity, and they are stated to be excellent food. It is calculated that French vineyards can provide in this manner food equal to more than 800,000 tons of hay.

The Italian Government has approved of a project for the enlargement of the port and construction of new docks at Palermo, which will make the Sicilian capital one of the most important seaports of the Mediterranean.

A "Society for Promotion of the Atmospheric Purity of Cleveland" is an association which has been formed to suppress the smoke nuisance in that city.

The closing down of all the Chilian mines may result from the fall in price of silver. The situation has caused much excitement among those interested in the mining industry of Chili.

Returns from the Bureau of Statistics show that imports of merchandise into the United States during the year ended May 31, 1893, exceeded exports to foreign countries by $87,627,444.

Chili has recently received her newest and finest cruiser, the "Capitan Prat." The vessel was built in France, and is of 6900 tons displacement. She carries four 9½-inch and eight 4¾-inch Cavet guns and bears a water-line belt of 11¾ inches of armor, while her ascertained speed is 19 knots an hour.

The "Campania" in her last westward voyage broke the record for the best day's run, accomplishing 548 miles in 24 hours.

Insurance companies report unusual difficulty in collecting balances, and July statements promise to exhibit an enormous amount of premiums uncollected. Fire insurance corporations thus find their margin of cash in hand for the payment of losses uncomfortably narrow.

United States Consul General Wallace of Melbourne reports the great success of Australian hard woods for street paving. The "jarrah" and "karri," both indigenous to Australia, are used in the most frequented roadways of the principal cities, and are found to give the best results as paving material.

The prolonged drought in Europe has at last broken up, and much-needed rain is reported to have fallen. Its effects, however, will be serious on the year's crop returns of Great Britain, Germany, Austria, Italy and France; in all of which countries scarcity in many kinds of agricultural produce has occurred.

The sardine fishery of Brittany employs 2500 boats manned by 15,000 men. Along the coast are established 150 canning factories, which give work to about 12,000 persons, principally women, the total annual expenditure for labor, material, &c., reaching nearly $4,000,000.

Consul-General Hess of Constantinople is of the opinion that a favorable opportunity for the introduction of improved American milling machinery into Turkey is offered by the recent abolition of the 8 per cent. import duty hitherto levied on wheat and flour at Turkish ports.

A Genoese firm are reported to have collected and forwarded to Rio de Janeiro 38,000 Italian and Spanish emigrants during the past year, under a contract with the Brazilian Government.

A Washington dispatch states that the Ordnance Department of the Navy has prepared advertisements for nearly 1,500,000 pounds of steel forgings to be used in the construction of 4, 5, 8 and 12 inch rifled guns.

The interest created in our new men-of-war has stimulated the formation of further battalions of naval militia. Several States are now contemplating their establishment. At present over 2000 officers and men are enrolled.

The Austrian Government are content to pay the piper to a pretty tune for the purpose of "encouraging home industries." Thirty-seven dollars and ninety-two cents per ton for steel rails is the price which they have agreed upon, and to get even this they have had to place the whole of their requirements with native works for the next five years, meaning from 100,000 to 150,000 tons.

China protests vigorously against the enforcement of the Geary act as derogatory to her dignity and disturbing to the friendly relations existing with the United States. The Government of the Empire has officially requested a reconsideration of the obnoxious law.

A movement is on foot in England to have all iron and steel manufactured in that country regularly stamped as of British manufacture. The proposal is stated to have been heartily taken up by the British Iron Trade Association, and some hundreds of manufacturers have intimated their willingness to so mark their goods whenever possible. The idea is to obviate the mistakes and loss arising in the foreign trade from imitation of trade-marks by foreign competitors.

An Engineering Exchange has been established in London, in the premises of the London Shipping Exchange, Billiter street. The exchange has writing, reading and smoking rooms, refreshment and dining rooms, board and committee rooms, lavatories, exchange telegraph tape, telephones, and all conveniences. The general membership exceeds 1000. 'Change is held daily from 3.30 to 4 p.m. Engineers visiting London can obtain an order to visit the exchange from the secretary, Mr. A. T. Salisbury-Jones, 33 Old Broad street, E.C., or from a member of the committee.

Sir Thomas Sutherland, M. P., chairman of the P. & O. Company, at the half-yearly meeting of that steamship corporation in London recently, said that an analysis of the returns of all the great British shipping companies showed a melancholy record of bad trade and inadequate profits. The depression in shipping stocks is, however, more plainly exemplified by the Stock Exchange quotations, from which it appears that the average depreciation of these stocks is not less than 50 per cent.

We are indebted to Daniel P. Holmes, Norwich, N. Y., for a warm-air furnace estimate book that he has just published. The volume, 7½ x 5½ inches in size, is bound in stiff covers, and contains a set of 50 furnace estimate blanks that will be appreciated by the trade. Every two facing pages contain the blanks for the estimate. The first page gives a line for address and date of contract, the amount at which it is taken, together with spaces for cubic contents of the house. Then comes the furnace and the list of registers, borders, &c. Tin pipe, boxes, heads, collars, dampers, thimbles and all the other necessary furnace fittings are given. At the end of the second page are miscellaneous items, such as asbestos coverings, cold-air boxes, &c., together with space for the work, railway fare, board bills and such items. The whole thing is very compactly arranged and is a permanent record of the different jobs.

LABOR EXCHANGE.

Notices under this heading of reasonable length are inserted free of charge. Only those relating to employment are admitted. Write distinctly on one side of paper only, and do not use postal cards.

HELP WANTED.

At once, a good CORNICE MAKER; one who can estimate from plans and make himself generally useful. "H., S. & M.," office of *The Metal Worker*, 96-102 Reade street, New York City. July 8

A good all round PLUMBER who understands and can do steam and hot-water fitting; must have first-class reference; a permanent place for a reliable man; state wages expected. Harry C. Worrell, Riverton, N. J. July 8

A first-class PLUMBER can obtain steady employment if sober and reliable; one that understands steam and gas-fitting preferred. J. V. Vrooman's Sons, Schenectady, N. Y. July 8

First-class HOT-AIR FURNACE MAN to take charge of our furnace department; must be competent in handling help, a good mechanic and a pusher. A. J. Lindemann & Hoverson Company, 223 Reed street, Milwaukee, Wis. July 8

STOVE SALESMEN for Iowa, Illinois and Wisconsin; Commission. "Stoves," office of *The Metal Worker*, 59 Dearborn street, Chicago, Ill. July 8

Young man to assist in the heating department of an established firm; must be accustomed to hot air furnace, range and tin shop work, and be experienced in estimating, especially from plans and in getting work ready for shipment; one previously employed in this capacity preferred; give explicit particulars. "Thoroughly Reliable," care of *The Metal Worker*, 96-102 Reade street, New York City. July 8

A large tinware manufacturing house wants a man thoroughly posted in that line to take charge of their shipping department, which includes the getting out and packing of orders; one who has held a similar position preferred; to the right party this is an excellent opening. Address, with references, "Tinware," office of *The Metal Worker*, 96-102 Reade street, New York City. July 1

A first-class COPPERSMITH who thoroughly understands making hotel kitchen utensils. "W. L. C.," office of *The Metal Worker*, Bank of Commerce Building, St. Louis, Mo. July 1

A first-class HOT-WATER FITTER; one who can do general jobbing on tin and sheet-iron work; good pay; steady work. C. K. & C. W. Labaree, Bellows Falls, Vt. July 1

Experienced man to take charge of steam heating and plumbing department. Canfield Stove Company, Rondout, N. Y. July 1

A man thoroughly acquainted with the trade to travel, handling our self-pouring oil can. Paine, Diehl & Co., Philadelphia, Pa. July 1

SITUATIONS WANTED.

By a thoroughly PRACTICAL MECHANIC; understands house heating by steam, hot water and hot-air furnaces; can draft patterns for all kinds of sheet metal work and do work from plans. J. P. Lisk, Box 391, Bridgeport, Conn. July 8

A young man wishes a position in city or country as first-class tinsmith, roofer, tin and sheet-iron worker, general jobber; knows how to repair stoves, ranges and heaters, also a little plumbing. S. Richmond, 31 Monroe street, New York City. July 8

TRAVELING SALESMAN who has been with a tin-plate stamping house for the past 13 years and has taken in all the principal cities in the United States and Canada, desires a situation, either on salary or commission. H. H. Witte, 84 North Washington avenue, Columbus, Ohio. July 8

By an all-round SHEET METAL WORKER, CORNICE and FURNACE MAN of 18 years' experience; can take charge of shop and act as foreman, and works from planes; would be pleased to engage with some firm west of Missouri River by July 10. James Thomas, Denver, Col. July 8

By a TINSMITH and ROOFER, city or country. Geo. McGinis, 197 Mulberry street, New York. July 8

By a TINSMITH, steady job at low wages. H. Marcus, care of Mr. Shipman, 47 Lewis street, New York. July 8

SUPERINTENDENT of stove foundry desires position; 11 years' experience with first-class concern; West preferred; first-class reference. "Superintendent," Box 78, office of *The Metal Worker*, 96-102 Reade street, New York City. July 8

By a good TINSMITH with 12 years' experience—three years in this country—at a salary of $2 a day. S. Hyman, 201 Forsyth street, New York. July 8

As FOREMAN by practical tinner of 16 years' experience at roofing, slating, cornice and furnace work; best of reference; small city in Indiana or Illinois preferred. "O. L. R.," 303½ North Thirteenth street, Terre Haute, Ind. July 8

By a TINNER and CORNICE MAKER who can cut patterns and work at hammering and stove work. Chas. J. Lindel, Tuscumbia, Ala. July 8

By a first-class PLUMBER, in city or country; best of references given. Robert Smith, 964 Third avenue, New York City. July 8

A young man, age 26, with 12 years' experience in tin, sheet-iron and cornice work and roofing, understands plumbing and gas fitting and does all kinds of general jobbing, speaks English and German, desires a steady position. H. Altman, 83 Sheriff street, New York City. July 8

By a young man, a steady situation as PLUMBER, to work under instruction; graduate of New York Trades School; has had considerable experience at trade; good reference. P. O. Box 39, Moundsville, W. Va. July 8

TINSMITH and ROOFER, and for other general jobbing. Jacob Samuals, care of Mr. Dzalka, 110 Clinton street, New York City. July 8

By a STOVE IRON PATTERN FITTER; several years' experience. "J. L.," office of *The Metal Worker*, 96-102 Reade street, New York City. July 8

CORNICE and SKYLIGHT MAKER, CUTTER and DRAFTSMAN; a thorough mechanic in all branches; capable of taking charge of shop; has experience as foreman; understands handling help to best advantage and work; would like a steady position. "C. D. F.," office of *The Metal Worker*, 96-102 Reade street, New York City. July 8

As PLUMBER by a sober and industrious young man; city or country. Henry J. Schlag, 420 East Fifty-ninth street, New York City. July 8

Position in good cornice shop to assist in cutting and work under instruction; state wages to a steady man. Chapman & Chapman, Hutchinson, Kas. July 8

By a TIN and SHEET-IRON WORKER with ten years' experience; city or country; New York preferred; sober and industrious. "A. G.," care of B. Abel, 189 Christie street, New York. July 8

SHEET METAL PATTERN CUTTER desires position in a first-class cornice shop; thoroughly competent to take entire charge, New York or vicinity preferred. "Pattern Cutter," office of *The Metal Worker*, 96-102 Reade street, New York City. July 8

BRASS FINISHER, soft and hard solderer; city or country. Louis Fried, 124 Lewis street, New York. July 8

SALESMAN would like to engage with house carrying a full line of tinners' supplies to cover New England States; can dispose of large amount of goods, as previous records will show. "D.," 575 Hudson street, New York. July 1

A first-class TIN and SHEET IRON WORKER, has been at the trade for 20 years doing furnace, stove, roofing, pumps, iron pipe and general jobbing, wants a steady situation; temperate and reliable. F. Mead, Long Island City, N. Y. July 1

STOVE SALESMAN that is acquainted with the trade in Missouri to represent a good line of goods that is made near that territory and known in that State; give reference and state salary wanted. "R.," office of *The Metal Worker*, 22-24 Pickering Building, Cincinnati, Ohio. July 1

By a young man of 31, married, in retail stove and tinware store; five years' experience as salesman and buyer; A1 reference. "Stoves," office of *The Metal Worker*, 96-102 Reade street, New York City. July 1

By a sober and industrious TINNER and CORNICE MAKER, who also understands plumbing; can go to work in 30 days after notified; $2.50 a day desired, with steady work for a year. Chapman & Chapman, Hutchinson, Kan. July 1

PLUMBER, practical, and first-class mechanic, desires a position as FOREMAN, or would work journey work; 18 years' experience at trade; wages must be first class; please state wages. James Emmett, care of Usher, 427 E. 114th street, New York City. July 1

By a practical TINSMITH with 16 years' experience in all branches of the trade; can do furnace, heater, range, roofing and pump work and general jobbing; fair knowledge of plumbing; capable of taking charge of shop; steady position year round; state terms; German; married. "William," care H. Rathjen, 13 Columbia Heights, Brooklyn, N. Y July 1

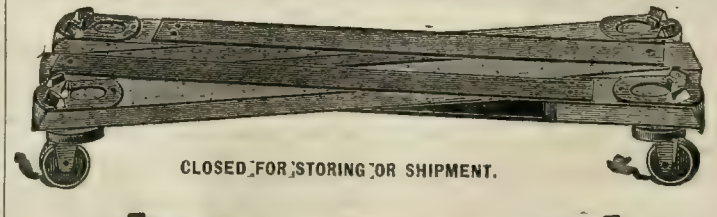
A young man (28), thoroughly conversant with steam and hot-water heating, capable of estimating, drawing plans, erecting or superintending same, is desirous of a position with an establishment where industry will be appreciated. "Hot-Water Engineer," office of *The Metal Worker*, 96-102 Reade street, New York City. July 1

An ARTIST wishes work painting machinery or anything; wages very low; understands oil, water colors and varnish. "J. P.," Box 87, Medina, Ohio. July 1

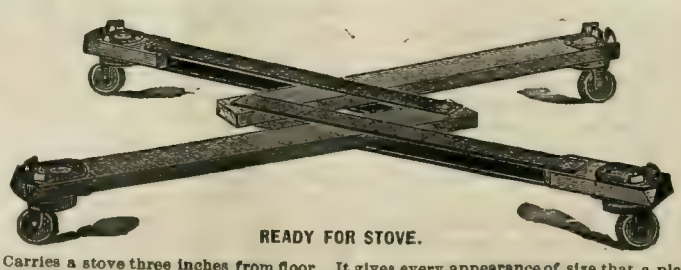
By a first-class TIN and SHEET-IRON WORKER of 15 years' experience and a hustler; strictly sober and reliable; understands all kinds of work; city or country; has had charge of men. "Tinsmith," P. O. Box 37, Taunton, Mass. July 1

Situation as FOREMAN or JOURNEYMAN BRASS MOLDER; first class on engineers' electric, hydraulic and general brass work, heavy or light; also on church, plantation and other bells; well up in the mixing and melting of any kind of metals and general details of a brass foundry; location no object. H. W. West, 231 Brush street, Detroit, Mich. July 1

THE IMPROVED **LOCK FRAME STOVE TRUCK.**



CLOSED FOR STORING OR SHIPMENT.



READY FOR STOVE.

FOR SALE BY THE **Stove and Hardware Trade.**

SEND FOR CIRCULAR.

Carries a stove three inches from floor. It gives every appearance of size that a platform does and holds stove secure and solid without clamps, yokes, bolts or other useless contrivances, so that

ONE MAN CAN HANDLE ANY STOVE WITH EASE.

Manufactured by RANDALL & WARD, LeRoy, N. Y.

THE METAL WORKER.

NEW YORK AND CHICAGO.

Saturday, July 15, 1893.

DAVID WILLIAMS, - PUBLISHER

BUSINESS OFFICES:

NEW YORK.....96-102 Reade Street.
PHILADELPHIA.....220 South Fourth Street.
BOSTON .....146 Franklin Street.
PITTSBURGH..... Room 509 Hamilton Building.
CHICAGO.....59 Dearborn Street, cor. Randolph.
CINCINNATI.....Rooms 22-24 Pickering Building.
ST. LOUIS.....Bank of Commerce Building.
CLEVELAND.....312 The Cuyahoga.

BRITISH AGENCY: The Ironmonger, 42 Cannon street, London, England.

Wind-Proof Houses.

The recent disastrous cyclones that have been devastating towns and agricultural sections in the Western States point clearly to the need of a much more secure system of building for the cyclone districts—a system in which sheet metal will probably occupy a prominent place among materials employed for the purpose. At present, and probably for a long time to come, wood must be relied upon for frame work, but for the outside, as well as for the roof, sheet metal as a covering for a truly wind-proof house possesses advantages found in no other material. A wind-proof house is one that can neither be blown down nor have its windows blown in by any wind generated in a natural way. It might have been said, also, one that cannot be blown upward by any natural wind, since accounts of the way buildings are destroyed by the cyclones indicate that many of them are lifted bodily and carried a considerable distance from their foundations.

Wind Pressure.

In order to make the wind press down instead of lift up a building, the sides of the structure should be inclined inward from the bottom upward, as in the Egyptian style of architecture, of which the Pyramids may be taken as an extreme example and the Tombs Building, in New York City, an example of less pronounced application of this principle. A proper amount of inclination would cause the wind to press a building down upon its foundations with greater force than its lifting power. Such a building, having a frame of strength sufficient to withstand the lateral pressure of a cyclone, anchored so that it cannot be slidden off its foundation, while at the same time carrying a continuous covering of sheet metal and provided with stout sash, glazed with small panes of glass, could be made to withstand the force of any cyclone. Of course, the designing of such a building would introduce some novel problems for the consideration of architects, and which would include modifications in methods of heating, ventilation and plumbing; but there can be no doubt that if the attempt was made to construct frame buildings that would safely withstand a wind pressure of, say, 80 pounds per square foot, which is probably as great as is exerted by any natural wind, the desired result could be obtained without any notable difficulty and without extravagant cost.

Absence of Shipping Directions.

Our attention is called to the frequency with which merchants neglect to accompany mail orders for goods with explicit shipping directions. Orders of this kind are often hurriedly written, and, as the merchant has been buying goods from the same firm for years, he has no thought but that its members are familiar with the route by which his goods are shipped; or he may add, "ship same as last." This is probably more annoying than if no shipping directions were given, as it indicates that the merchant has a decided preference as to the route by which the goods are to be shipped, and yet gives no specific directions on this point. The shipping clerk is obliged to search through perhaps six months' business to find how the merchant's last order was shipped, and at a time when he can ill afford to give the attention required. Again, the clerk is apt to have no intimation of how goods are to be shipped until the goods packed ready for shipment are turned over to him for making out the bill of lading. Perhaps 50 or 100 other bills of goods are to be gotten off the same day, so the one entailing the extra amount of labor is laid aside until he has more time. The merchant, in such a case, is displeased because the goods are not promptly shipped. Very frequently there are two stations of the same name in the same State, in which case it would be an advantage to have the county mentioned. In other instances, where goods are ordered by a customer living at a certain post office address whose shipping point is elsewhere, according to the guide used by the shipping clerk, the goods would be shipped to a certain railroad station. The customer, however, might prefer, on account of the better condition of roads or for other reasons, to have the goods shipped to a station other than that mentioned in the shipping guide.

A Good Suggestion.

It is suggested by a large wholesale concern in Philadelphia, in connection with this subject, that it would be an excellent idea for customers in every instance to put on their letter heads the name of the city, county and the State in which they live; and also, if they desire goods shipped to a certain point to have this, too, printed on the letter heads. They state that they occasionally receive letters from customers at the top of whose letter heads are printed the names of the railroads on which they are located, all of which is a decided advantage to the house shipping the goods, saving the annoyance of having goods go to a wrong town, and also saving considerable time in looking up shipping directions. It would be still better if merchants would have order blanks printed with ink that would copy in a letter book, and use copying ink in writing orders, so that a complete record of each order could be found at any time by referring to the letter book. Orders given to traveling men, as well as those sent by mail direct to the house, should be made out on an order blank and copied. At the head of the order blank should be printed the name of the town and county, the railroad or boat route by which the goods are to be sent, and, if by boat, whether the goods are to be insured or not. The terms upon which the merchant wishes to purchase the goods should also be mentioned. All these directions should be given on each order, so that each order will be understood by itself without the necessity of referring to a previous one. The goods ordered should be designated by the catalogue number, or, if no number is given, the size, quality and price of the article should be mentioned. In ordering special goods it is well to insure prompt shipment by adding the word "preferred," "or similar," thus allowing the jobber or manufacturer to substitute such goods as he may, in his judgment, think will be acceptable to the merchant. In a word, the shipping directions and order for the goods should be so plainly given that they cannot be misunderstood.

Savings Banks and Tight Money.

A homily might be written just now on the evils of savings banks. Here are these supposedly beneficent institutions, which encourage thrift among working people, suddenly locking up immense amounts of currency to enable them to withstand "runs" from their depositors and thus causing money to be tighter than ever in the towns in which savings banks are located. They have become very numerous throughout the country, penetrating even rural districts, but are of course strongest in manufacturing towns. In ordinary times they add considerably to the banking capital of the community, enabling manufactur-

ers and business men to enlarge their operations, and perhaps extend them more than they would if money was more difficult to get. At a time like this, however, when accommodations are urgently needed, loans are all called in, and a large share of the available cash of the community locked up for days that may be dangerous, or weeks that may be fatal, to business life. It is unfortunate, but it cannot be helped, and savings banks are not to be condemned for this occasional eccentricity in their usually benignant career.

Electricity vs. Gas.

One of the most interesting contributions to the much vexed question of the competition between gas and electricity was contained in a paper read at the last annual meeting of the Ohio Gas Light Association by Joseph Gwynn. Mr. Gwynn told his fellow gasmen that from investigations he had made into the business of 200 gas and electric light companies he was satisfied that electricity was advancing with unparalleled rapidity in all directions. Gasmen could not shut their eyes to the fact that it had grown more rapidly than the gas business in the past decade, and that a still greater advancement was to be expected in the immediate future, although, ultimately, it might be somewhat checked as the novelty wears off. To demonstrate the growth of the arc-lighting business, it was shown that in 1881 only about 1,000,000 carbons were manufactured, whereas to-day there are upward of 145,000,000 carbons being made and sold annually, showing an average yearly increase of over 12 per cent for the past 12 years. The effect of this growth of lighting by electricity on gas lighting is very noticeable. The following are Mr. Gwynn's words: "To-day, out of over 928 gas companies in the United States, we find of that number only 435 have contracts for street lighting, and 493 have lost the street lighting business entirely, which has been displaced by arc and some few incandescent lights. While, on the other hand, a great many of the gas companies who still do street lighting, do only a limited business in this line, as street lighting by gas is being gradually displaced by electricity and will eventually be a thing of the past." The incandescent lighting business has also advanced enormously, and it last year showed a net increase over gas business of 93 per cent. The use of electric motors for power purposes has also grown in much larger proportion than the use of gas engines in recent years, and the power supplied by this means is doubling itself each year. "The continued improvements," said Mr. Gwynn, "which are many and great in electrical appliances, will continue to make the electric business more simple and reliable, and will still hasten its progress rapidly on for some years to come." In concluding the speaker advised gas companies for the salvation of their business to stand firm and push their business with all the vitality they possess; and to strive to make as good quality of gas as is possible, at a minimum cost, selling it at the lowest price possible to give a fair return on the capital invested. He also urged them to pay special attention to the gas heating and cooking business, this being an almost unlimited field for gas companies, and one that is not likely to be disturbed in the near future by their competitors—the electric light companies. Mr. Gwynn's conclusions have been dissented from by a number of gas authorities, who bring forward the question of cost to the public, one gas journal asserting that the electric light is more costly than gas to the consumer in nine cities out of ten in which it is used, while in the tenth it is probable that the electric light companies are run at a loss. There is at present no indication that the electric current can be more cheaply generated than is the case now; but that is among the possibilities of the future, and when this end is attained the gas companies will surely have to look more to the heating business than to lighting for return from their capital.

How Jones Got an Order.

BY L. A. N.

Many years ago there dwelt in a not far distant town, noted for the generally moral and religious tone of its society, a very industrious, but decidedly unorthodox tinsmith whom we will call Jones. He was so industrious and so unorthodox that, as he never voluntarily entered a church or a religious assembly, he preferred to put in his time on Sundays working steadily in his shop, rather than to rest or go fishing, the, to him, only remaining alternatives. Closing the doors and the wooden shutters of the front windows of his shop he worked diligently while his church-going neighbors were spending their hours in their accustomed devotions.

It so chanced that he obtained a job requiring considerable hammering, the sound of which, as his fellow citizens passed his shop to and from church on Sunday, gave offence. The next day, Monday, he was waited upon at his shop by a self-appointed committee of church goers, who remonstrated with him, and not only pointed out to him the wickedness of his conduct, but described to him a place appointed for sinners, enforcing their arguments with frequent citations of the scriptural command to keep the Sabbath holy and to do no work on that sacred day of rest and worship. To their surprise Jones, who could hold his end in an argument pretty well, and was known to be rather fond of arguing, meekly listened to what his protesting townsmen had to say, and after they had concluded shook hands all around, promising that he would change his course of conduct on the Sabbath in deference to his neighbors' wishes, whereupon they departed much gratified with the result of their interview.

A worthy deacon, in the course of the week, dropped in upon Jones with an order for quite a profitable job, that but for Jones's apparently penitent and hopeful state of mind would certainly have gone to his principal competitor, Smith, who was in the odor of sanctity in the community though he was not nearly so good a tinsmith.

The next Sunday the sound of Jones' hammer was not heard; but conspicuously displayed upon the outside of one of his front window shutters was the following inscription:

"Six days shalt thou labor and do all thy hammering; but the seventh day thou shalt not hammer; thou shalt put in the time soldering, which cannot be heard in the street by thy son, nor thy daughter, thy man servant nor thy maid servant, nor thy cattle, nor by the pious neighbors who pass thy gates."

Exodus XX, 9, 10, Jones' version.

The deacon would have gladly withdrawn his order after reading Jones' version, but Jones had been cute enough to begin the work, and he held the deacon to his contract.

"The Metal Worker" at the World's Fair.

Doubtless a large class among the readers of *The Metal Worker* will visit the World's Columbian Exposition at Chicago during its progress, and at the same time will be glad to know what is going on in their respective branches of trade, as chronicled in the paper from week to week. With a view to rendering reference to its pages an easy matter on the part of visitors, we have arranged with concerns in some of the leading lines covered by *The Metal Worker* to place it on file at their headquarters on the Fair grounds.

Among such firms may be mentioned:

Peck Brothers & Co., Manufactures Building, Section N, Block 4.

Michigan Stove Company, Section O, No. 77.

Magee Furnace Company, Section O, No. 73.

A New Form of Lightning Rod.

A correspondent of *Engineering* states that an accident which took place a short time ago in one of the large Silesian foundries, and which almost proved of disastrous consequences, has induced the owners of the Carls Works in Bunzlau, Silesia, Germany, to make a rather ingenious invention, to which public attention ought to be turned, the question being of importance.

Some time ago the heavy iron bar at the upper end of the lightning conductor of one of the high chimneys in the foundry fell from its considerable hight and caused great damage. The reason was that the vapors escaping from the mouth of the chimney had completely destroyed the lower part of the iron bar. In another case, where the bar was of copper, the lower part became completely oxidized, and the bar bent over and fell. Owing to the ever-varying composition of the coal, containing, for instance, greater or smaller quantities of pyrites, and developing therefrom sulphurous acid by combustion, there must always be danger of complete oxidation and falling down of the lightning bar. The question is now, how to stop this inconvenience?

The Carls Works, Bunzlau, in Silesia, Germany, have met the case in the following ingenious way: The metal bar, being, as a rule, about 4 feet in length and 1 inch in diameter, is surrounded or inclosed by a system of glass tubes of a special form. The interval between metal and glass is filled up by a special kind of cement. The upper end of the highest tube is covered hermetically by a small conical glass, allowing only the platinum point of the bar to project.

The advantage of the construction is obvious. The glass is not susceptible to atmospheric or chemical influence. But there is still a second point worthy of consideration. As a matter of fact, any metal will lose more or less its quality of conducting electricity by oxidation of even only its surface. Thus in time the whole lightning conductor may become useless. To prevent even the slightest oxidation, the above apparatus is suitable.

STEAM AND HOT WATER.

One-Pipe Steam Connections.

BY HELIOS.

Fig. 1 shows connection for one-pipe work from main steam pipe to riser that supplies steam to radiation on upper floors, with drip connection from bottom of riser and drip pipe connected into side of main steam pipe. The branch from the main steam pipe is taken from the top and drips in the direction shown by arrows, if the branch pipe is over 4 feet long; if less than 4 feet it can be level. This connection is used where the branch pipe is long and relieves it of all condensation. It can be used any length. The drip pipe is taken from the bottom of the riser and is usually about two sizes smaller than the steam supply. This drip is connected into the side of the return main when the main return is below the water line.

Fig. 2 shows connection for one-pipe work from main steam pipe to riser that supplies steam to upper floor, with drip connection from bottom of riser. This connection is made the same as in Fig. 1, only the drip is connected into the top of the main return pipe. This connection is used where the main return pipe is above the water line of boiler. In all one-pipe steam work the best results are obtained by having all returns above the water line dropping down to the return connection at the boiler. By having the return above the water line there is no water in the return mains, the boiler will make steam very much quicker and a circulation will be obtained throughout the apparatus in a short time, and if the fire is low in the morning steam can be had in a short time. But if the returns are below the water line and the fire is low, it will take some time to raise steam as the returns are feeding cold water to the boiler, and it will take a much stronger fire and longer time to produce a perfect circulation throughout the radiation.

Fig. 3 shows one-pipe connection to riser from the main steam pipe, with branch pipe connected to under side of main steam pipe and valve in main rising pipe. This connection is used in any place where there are a number of rising pipes supplying steam to radiation on upper floors. The branch supply pipe is taken from the bottom of the main steam to allow the main steam pipe to be run as near the ceiling as possible and to allow room to place the valve in the riser below the floor. By taking the branch pipe from the bottom of the main steam pipe all condensation in the main steam pipe is dripped into the returns at each connection. By placing a valve in the rising pipe repairs can be made to the piping on radiation without interfering with the working of the apparatus, and if the valve is closed it allows the condensation from the main to drip into the return pipe.

Fig. 4, shows one-pipe connection from the main steam pipe with branch pipe taken from the bottom of main steam pipe and connected to riser. This connection should always be made where the main steam pipe is reduced in size, as it removes all condensation from the main steam pipe, which insures a perfect working apparatus and free from noise.

Fig. 5, shows one-pipe connection to a radiator on the second floor connected to the riser, also riser connection to main steam pipe. The tee in the main steam pipe is set at an angle of 45°. A short pipe is run from it and a 45° elbow is screwed on the end which will stand plumb to receive the riser. A tee is placed between the ceiling and floor for connection to upper radiator. This must be set as shown in plan, Fig. 6, using three nipples and three elbows to make the connection to receive the pipe that is screwed to the radiator valve. Always use this connection where the branch pipe from the riser is under the floor, as it allows for contraction and expansion. Be sure and have the connection from riser to radiator drip back into the riser, and be sure that no water can remain in the piping, for if there is water in this connection there will always be a sound of boiling water in the radiator.

The lower radiator, Fig. 5, shows a connection with drip pipe from bottom of radiator connection. This connection can be used to connect a radiator that is any distance from the main steam pipe; the supply pipe to radiator to drip in the direction that the steam flows and the return to drip back to the return main. If the connection from the main steam pipe to the radiator is short, take the supply out of the top of the main and not from the side.

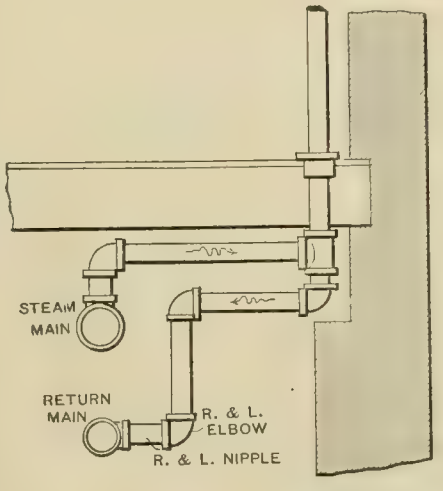


Fig. 1.—Showing One-Pipe Connection to Radiator.

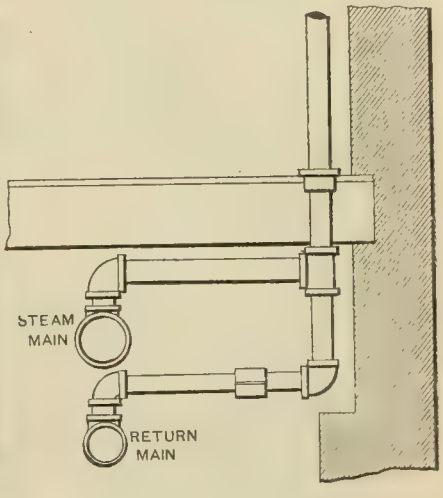


Fig. 2.—Showing One-Pipe Connection to Riser.

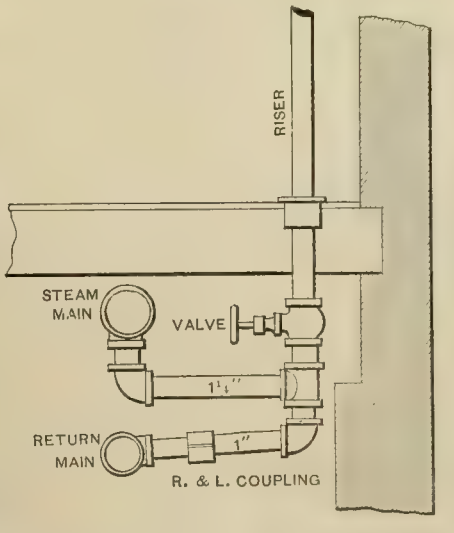


Fig. 3.—Branch Taken from Under Side of Steam Main with Valve in Riser.

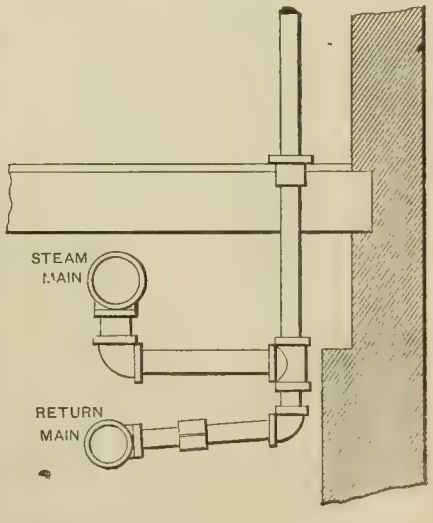


Fig. 4.—Branch Taken from Under Side of Steam Main without Valve in Riser.

ONE-PIPE STEAM CONNECTIONS.

Fig. 7 shows a side elevation of the main steam and return mains for connection to radiator and riser. Always connect all radiation on first floor direct to the main and not to a branch pipe that connects to a riser.

HEATING NOTES.

THE HARELL STEAM HEATING COMPANY of Dunkirk, N. Y., favor us with a circular calling attention to the Splendid Radiator, which is made plain and ornamental and connected with slip nipples. The company state that in the manufacture of these radiators nothing but the best materials are employed, and that the goods are guaranteed to be perfect in every respect. A table shows the list of sizes in which the radiators are made, together with the heating surfaces.

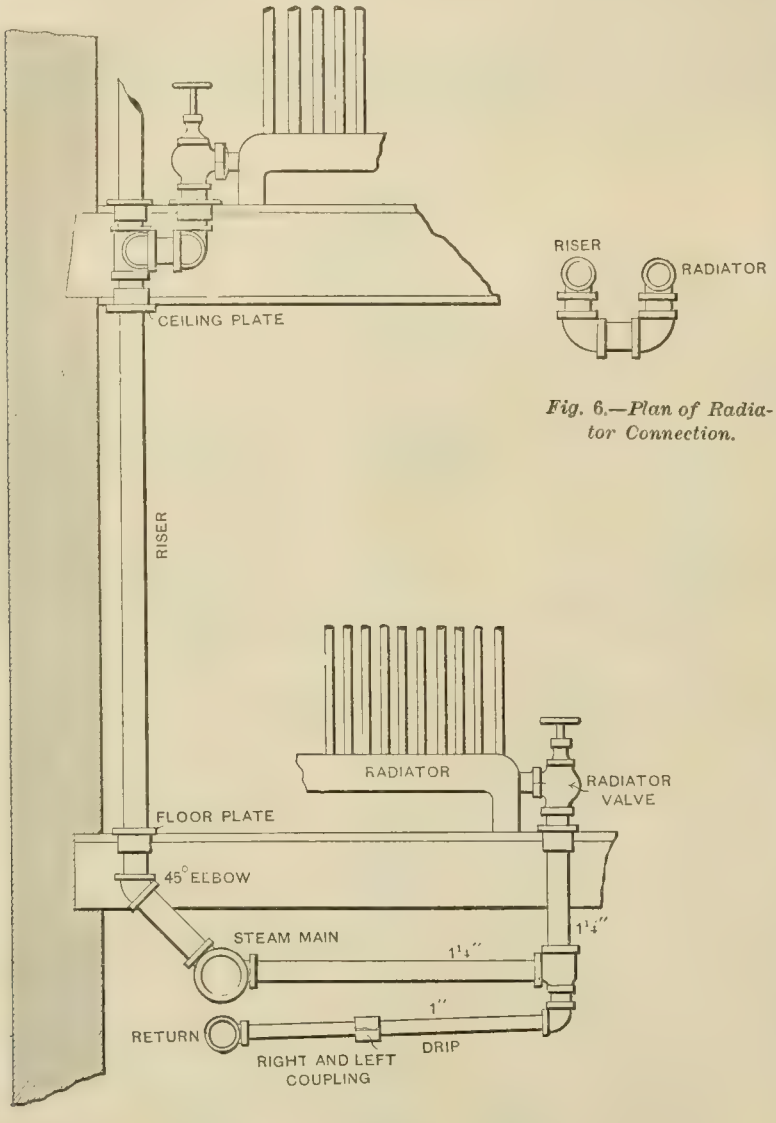


Fig. 6.—Plan of Radiator Connection.

Fig. 5.—One-Pipe Radiator Connections.

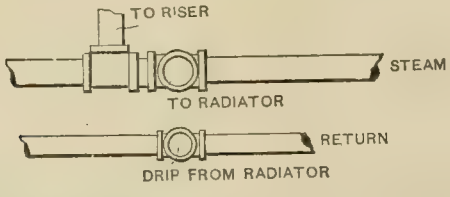


Fig. 7.—Side Elevation of Steam and Return Connections.

ONE-PIPE STEAM CONNECTIONS.

THE EXETER MACHINE WORKS of Exeter, N. H., and 32 Oliver street, Boston, Mass., have brought out an illustrated catalogue of Exeter safety sectional steam boilers for power and heating, and of Exeter steam and hot water radiators. The volume consists of nearly 50 pages of letterpress, printed in a tinted ink and profusely illustrated with engravings of the goods named. The frontispiece is a section through a private residence, showing the manner in which the Exeter steam heating plant is installed in connection with buidlings of that character. An interesting feature of the catalogue is a general view of the company's works and a plan view showing the relative position of the various buildings and departments. In their announcement to the trade they state that they commenced the manufacture of engines, boilers and steam-heating apparatus more than a century ago with a small plant and their sales territory confined to the New England States. Since then they have erected extensive additions to their works, employ a large force of men, and their product may now be found distributed throughout all parts of the United States and in many foreign countries. The Exeter boilers and radiators are carefully illustrated and described, and the catalogue, as a whole, is likely to prove valuable to those in the trade into whose hands a copy may come.

THE FRIENDS in the trade of F. A. Smith will, no doubt, be interested to learn that he has associated himself with the William H. Page Boiler Company of Norwich, Conn, taking entire charge of the sales department. We understand that all business will be conducted through F. H. Patrick, superintendent of the company, and Mr. Smith of the department named. Mr. Page has perfected the invention of a fine line of house-heating boilers, for both steam and hot water, and patents have been secured covering all points on these constructions, including the regulator by which the draft is controlled.

THE NEW YORK OFFICE of the American Boiler Company presents an attractive appearance to the steam and hot water buyer, as in it there is to be found a fine display of samples painted with gilt bands and gilded lettering. The Florida line is represented by a No. 120 steam boiler for soft coal, a No. 16 and No. 25 single boiler for hard coal, a No. 50 double boiler and a No. 58 heavy duty boiler. The Spence line is shown by a No. 10, 30, 45 and 60 boiler, and the Perfect line by a No. 22, 25, 27 and 30 boiler; a No. 12, 16 and 20 Little Giant; a No. 13 and 21 Tropic with magazine, and a No. 501 Modern, and a No. 250 Soleil complete the finished samples. Some partially erected boilers, as well as sections of boilers, and some grates, show the internal construction, operation and convenience of the goods. Heating literature is freely distributed, and the visitor is sure to add to his store of information.

THE H. B. SMITH COMPANY, Westfield, Mass., have taken two stores, 133 and 135 Centre street, adjoining the old stand at 137, and make a very handsome showroom. The walls are light blue, with dark cornices and decorations. At the front, by an ingenious arrangement of differently decorated radiators of various sizes and colors, is produced a very pretty effect. The display is made up of the Golds indirect pin radiator, the Reed radiator in single and double column; the Union radiator, with its central and two side columns; the Champion Union, the Royal Union and the Imperial Union, the latter being of ornamental design and handsomely decorated in two colors of bronze. Along the walls are arranged Nos. 4, 4½ and 5 Mills boiler, a No. 1 and 2 Mercer boiler and a No. 1 and 2 Golds Boiler, the No. 2 being shown in a wood casing, painted to represent brick, and with a stack of pin radiators showing a central plant for indirect heating. A Cottage boiler occupies a prominent place, and is intended for heating small buildings. As the new showrooms are on the corner of White street, the wall is used for a conspicuous sign, enumerating the different goods, while gilt letters on a black ground show "Steam and Hot-Water Heating" on a large sign on the Centre street front. A comfortable reception room occupies a generou space, and is doubtless the scene o many business transactions. The engineering and drafting department wil remain at 137, and have more space.

JENKINS BROTHERS of 71 John street, New York, have recently made some important improvements in their pressure valves, which cannot fail to interest the trade at large. One is in the nature of a new way of retaining the disk holder in place, the number of bolts in the valve bonnets having been increased as well as the thickness of the flanges. We understand it is the intention to make but one grade of valve, so that it will be unnecessary for customers to specially mention "valves for high steam pressure," as the goods placed on the market will be suitable for any pressures. Jenkins Brothers have also made an improvement in the manufacture of a rubber compound for use on high pressure steam. For nearly two years they have been using and testing this rubber compound in the manufacture of Jenkins' disks, and the results are said to have been more than satisfactory. The makers state that it is past the experimental stage and is considered by them the greatest advancement they have made in the manufacture of their specialties. In this connection it may be interesting to state that the improvements made in the manufacture of Jenkins Brothers' goods have not increased their selling price.

WE HAVE RECEIVED with the compliments of the author a pamphlet entitled "The Heating and Ventilation of Residences," by James R. Willett. The matter consists of an address delivered before the Engineering Societies of the University of Illinois, on March 23 of the present year, and covers in an interesting manner the topics mentioned. A large number of folded plates are bound in with the text, showing plans of houses and indicating the position of registers, radiators, pipe, &c. The pamphlet is arranged in such a way as will likely prove interesting to those having to do with heating and ventilation.

W. M. MACKAY, who has a large acquaintance in the steam and hot water heating trade, has recently severed his connection with the New York office of the American Boiler Company.

THE STANDARD HOT WATER HEATING COMPANY of Cleveland, Ohio, under the management of Richard Howse, run the Spence and Humber boilers for specialties and have installed a great number of them in that city and locality. Mr. Howse has had a large experience in Canada and is thoroughly conversant with the pressure system, with which he has had universal success, though the open tank system is used, as a rule, in his work here.

ONE of the large contracts now being figured on in Chicago is for the heating and ventilating of the Stock Exchange Building, La Salle and Washington streets. About 38,000 square feet of radiation will be required, and the cost of plant is estimated at $100,000.

THE ELECTRIC BOILER COMPANY of Rochester, N. Y., send us an eight-page circular of the Electric boiler, which they manufacture for steam and hot water heating and also for steam power. The merits of the construction are clearly set forth, while sectional views indicate the course of the products of combustion and also the circulation of the water. The manufacturers are also distributing to their friends in the trade a postal card on the back of which is the following inscription: "Wait for a shock from the Electric Boiler for steam and hot water heating."

SCRAP.

"HAMILTON'S BEST" redipped American roofing tin no longer needs a lengthy description of its merits to the buyer, as a wide introduction of it is now bringing in satisfactory orders to the house of John Hamilton, Pittsburgh, Pa.

THE CINCINNATI TIN PLATE COMPANY of Cincinnati, Ohio, have been granted a charter, with a capital stock of $10,000, for the purpose of engaging in the manufacture and jobbing of metals of various kinds. Howard Douglass of Cincinnati is prominently identified with the new company.

WITH A DISPOSITION to accommodate their customers McClure & Co., Pittsburg, Pa., find a ready market for their line of tinners' supplies among the trade, who are glad to get what they want so near home. The firm handle Tuttle & Bailey's registers, Peck, Stow & Wilcox Company's machines and tools, and a line of domestic and foreign tin plates, among which are McClure's redipped, McClure's hand coated, Taylor's old style and Hamilton's best.

HAVING now finished all contemplated extensions to their plant, the United States Iron and Tin Plate Mfg. Company, Demmler, Pa., have a large capacity and excellent facilities for turning out high grade black sheets for tinning. Their tinning department is well prepared in every way to turn out either bright or terne sheets with a coating on which they are willing that the trade shall pass judgment.

THE PHILLIPS TIN PLATE COMPANY, 200 Walnut place, Philadelphia, Pa., have started their new works, and state that they are now in a position to furnish promptly both tin and terne plates, heavy or medium coated. In addition to their former grades the company announce that they will make a "heavy dipped terne of the M F grade with metal more uniformly distributed and smoother finish than on the ordinary heavy plate; also a Pontymister grade terne and a good coke tin," in addition to their heavier grades.

HUGHES & PATTERSON of Philadelphia are just getting ready to start the second of the series of fine rolling mills they are putting up on the old Stephen Robbins mill site recently purchased by them. All the old buildings on this property have been removed and in their place have been erected the most substantial iron and brick buildings. In these new buildings is now being installed a fine rolling-mill plant. These mills are being equipped with the newest and most modern machinery, and labor-saving devices are used everywhere. The product in all the mills is handled by Ridgway steam hydraulic cranes in connection with a system of overhead runways. The roll trains are so arranged that they can be changed quickly by the Ridgway cranes. The cranes for this purpose instead of being placed on the floor level, as is the usual practice, are carried between the tops of adjacent housings, thus being up and entirely out of the way. A large tinning plant is also being added to the works, the machinery for which to a large extent has been imported from Wales.

A bore hole at Paruschowitz, Silesia, Germany, had marked a depth in May of 2000 meters, or 6562 feet. Boring will be continued as far as possible. The deepest bore hole hitherto is that at Schladebach, Saxony, which is 1748 meters, or 5735 feet.

Treasury Decisions.

Drawback on Terne Plates.

TREASURY DEPARTMENT, MAY 11, 1893.

SIR: On the exportation of terne plates in sizes 14 x 20 and 20 x 28 inches, manufactured by Merchant & Co. of Philadelphia, Pa., from imported pickled or smoothed or cold rolled black plates, a drawback will be allowed equal in amount to the duty paid on the imported black plates used in the manufacture, less the legal deduction of 1 per cent.

The drawback entry must specify the number, brand, size, gauge and net weight of the finished terne plates in each package to be exported, and the number, size, gauge and net weight of the imported black plates used in the manufacture of such terne plates.

The manufacturers shall be required to state in their declaration on the entry that the terne plates were manufactured and packed in the manner described in their sworn statement dated April 26, 1893, and to furnish the proofs of identity prescribed by article 758 of the Customs Regulations of 1892.

The statements in the entry as to the quantity, sizes and weights of the terne plates to be exported shall be verified by an examination of the packages and their contents and by such test weights as may be necessary, and the quantity of the imported black plates used shall be determined on the liquidation of the drawback entry by the weigher's return made at the time of the importation.

Respectfully yours,
C. S. HAMLIN, Assistant Secretary.
COLLECTOR OF CUSTOMS,
Philadelphia, Pa.

George F. Brandan of Cohoes, N. Y., has invented a car brake which may be used either on steam or electric roads. The brake consists of a shoe with a frame made of iron which comes into contact with both the car wheel and the rail at the same time. A cable aids in the adjustment of the brakes, which is operated by the motorneer. A test of the new invention has been made on the Troy, N. Y., city railroad.

What seems to be showing for a new gas district has just been tapped south of Homestead, Pittsburgh district. Some time ago Munhall & Scott drilled a well on the S. A. Morrison farm, which was a good gaser, and last week they drilled in another, which has an estimated pressure of 150 pounds to the minute through a 6-inch casing. It is making gas from the Gordon sand. This well is about 5½ miles south of Homestead.

Four 13-inch guns needed for the new battle ships have been finished at the Washington Navy Yard. Each of these ships will carry four of these guns, mounted in pairs, in turrets forward and aft.

Fifteen hundred poles and 450 miles of overhead wire are to be removed during the current year in New York by the Metropolitan Telephone & Telegraph Company.

The Pottstown Iron Company of Pottstown have sold 4800 tons of basic slag to Germany.

PLUMBING and GAS FITTING.

Howell's Flexible Water-Closet Supply Connection.

Geo. B. Howell of Philadelphia has invented and patented a flexible water-closet supply connection, which, it is claimed, secures to earthen water closets two important features—a flexible connection to the flush pipe and an absolutely air and water tight joint. The advantage of a flexible connection is appreciated as obviating the liability to breakage of the supply socket when subjected to undue strain during connection, sudden jarring, settling of buildings and other causes. The device is shown complete in Fig. 1, and consists of an interior annular collar, D, to suit the earthen projection or socket of the closet A, a brass spud, B, to which is attached an ordinary metallic screw coupling, and a molded rubber gasket, C, which, when placed within the socket A and expanded tightly over the collar D and against the interior walls of the socket by the introduction of the spud B, securely locks the spud in position and forms an absolutely tight, though flexible, joint. The spud is held in position by the projection E, and is prevented from turning during connection or disconnection of the coupling by two projections on the flange F, which fit into corresponding notches in the face of the earthen socket A.

Fig. 2 shows the rubber gasket placed in the socket ready to receive the metal spud. The shape which the gasket assumes when expanded by the spud is also accurately illustrated. The joint thus made has, we are told, been found to be not only flexible, but more secure than the joints made with sulphur and other hard cements, and to form a rigid connection to the earthenware. Mr. Howell has also adapted his device to fill the demand for a reliable floor connection. Fig. 3 shows the floor connection as consisting of a brass floor plate or flange, A, provided with an interior annular collar, D, and a beveled lower portion, E, adapted for soldering to the lead soil pipe, an ordinary conical water closet outlet, B, and a molded rubber gasket, C, which, when expanded tightly over the collar D, within the flange A, by the introduction of the conical outlet B, forms an absolutely tight joint, capable of resisting heavy pressure. The floor plate A and the rubber gasket C are shown in position ready to receive the closet outlet B.

Fig. 4 shows the parts securely bolted together and illustrates the expansion which takes place in the rubber gasket, and demonstrates the security of the joints. It is claimed that in addition to the security afforded by the use of this connection it is economical to the plumber, inasmuch as it entails very little labor to make a joint and renders leakage impossible.

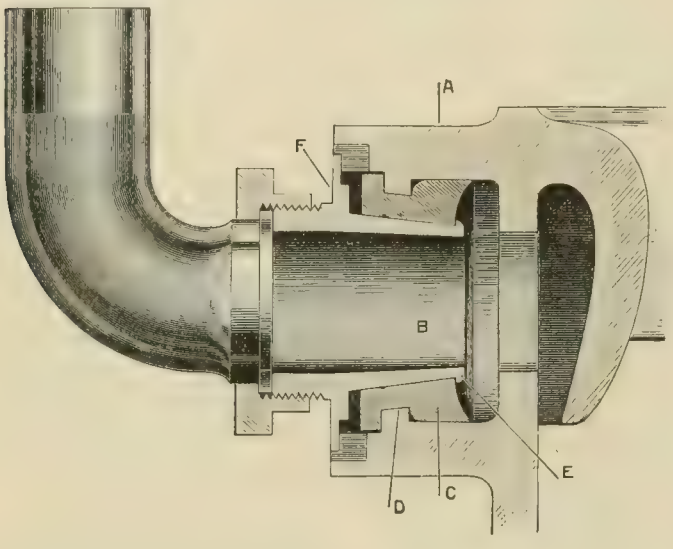


Fig. 1.—Sectional View of Connection.

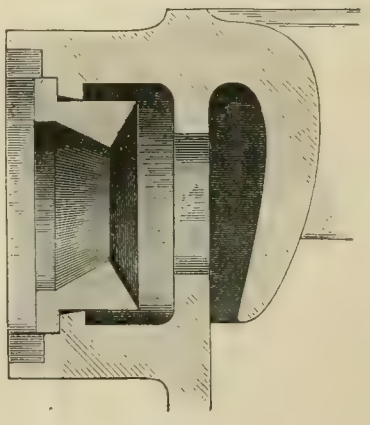


Fig. 2.—Gasket Expanded in Socket.

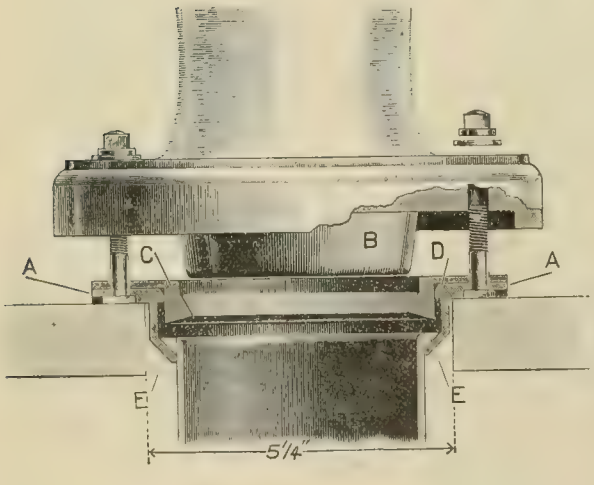


Fig. 3.—Floor Connection.

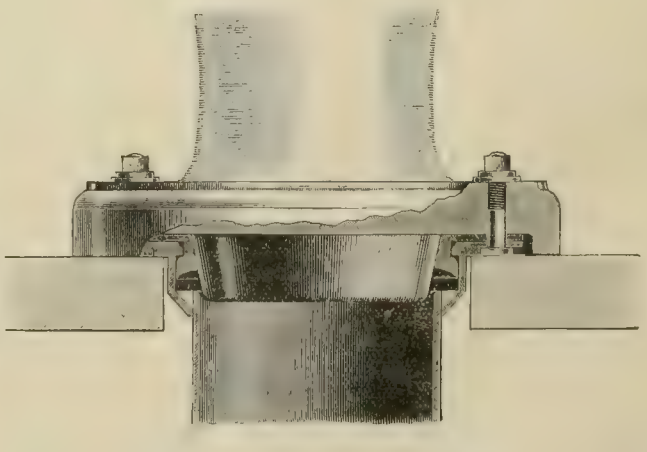


Fig. 4.—Floor Connection Bolted, Showing Expansion of Gasket.

HOWELL'S FLEXIBLE WATER CLOSET SUPPLY CONNECTION.

It will be noticed that the outlet of the closet projects into the lead soil pipe, and thus prevents any injurious matter from coming in contact with the rubber or solder joints. In making a joint the lead pipe should be cut so that its top edge will not project above the beveled portion E of the floor plate and the solder joint made as shown in the illustrations. Ample space is, however, afforded between the top of bevel, E, and the bottom of gasket, C, to allow for any reasonable irregularity in the end of the lead pipe or in the soldering.

Both connections have been placed on the market by McCambridge & Co., Limited, of Philadelphia, who, in a circular just issued, announce that a standard size outlet has been adopted for all earthen closets manufactured for them, in order that one standard size floor plate may suit closets of every pattern. They also announce their willingness to furnish brass gauges at small cost to manufacturers or jobbers desiring to adopt these connections. These gauges are for the use of the potters, who can make one size outlet as readily as another without any expense other than the cost of the gauge. Where for special reasons the outlet of a closet cannot conform to the standard gauge the firm can supply special plates and gaskets.

The Craft of Plumbing

Dr. William Garnett, principal of the Durham College of Science, in an address delivered recently at Newcastle-on-Tyne, England, before the North of England District Council of the Plumbers' Association, offered some practical remarks of great interest in relation to the training of plumbers. We reproduce here, for the benefit of our readers interested in this subject, extracts from Dr. Garnett's address which contain some valuable suggestions as well as information in regard to the methods of instruction practiced or proposed for adoption in trade educational classes in Great Britain.

In defining the duties of the plumbing craft, the speaker said: "Etymologically, the plumber is a worker in lead. According to the modern meaning of the term, the plumber is one who supplies our houses and other buildings with pure air and pure water. As the chief contaminations, both of air and water, are those which arise from the waste of animal (and to some extent of vegetable) life, it is essential that the plumber should provide for the removal of such refuse, or, at least, should so protect the air and water supply that contamination is impossible, and this necessitates the withdrawal from the neighborhood of our houses of all decomposing or decomposable material."

IMPORTANCE OF DRAWING.

Dr. Garnett laid special stress on the importance, to the plumber, of a knowledge of drawing, saying: It will be generally admitted that the essential feature of a craftsman is that he should be a master of his handicraft. In every large piece of work the pencil, or some substitute for it, must precede the ordinary tools of the workman. Drawing is the first stage of the work, and if the operative is to gain a leading position in his craft he must be able to make his own working drawings; but whatever position he attains, if he is to undertake any responsibility at all, he must be able to read a drawing, and the best way to acquire this art is to learn to make drawings himself. A working drawing is not a picture of the work to be carried out. A photograph of the actual thing would often be of comparatively little assistance to the workman who has to make it. A working drawing is a conventional representation of a solid piece of work by means of plane drawings, each of which represents, in accordance with certain geometrical laws, one aspect of the solid, while in many cases a pure symbolism is used which has almost as little connection with the true form of the solid as has its name when printed in ordinary Roman type. To combine together in the mind plan, elevation and sections, with all their dimensions as marked or represented to scale, and to picture in the imagination the thing represented, is to read the drawing, and this is as much an art as to mentally picture a landscape, or the heroine of a novel, from a letterpress description.

SYSTEM OF DRAWING INSTRUCTION.

Let us then, said Dr. Garnett, commence the out-of-shop training of the apprentice by teaching him to use his pencil, first by making freehand sketches of all the tools in his kit; then of various forms of traps and other appliances which he meets with in his every-day work. He will soon find out for himself that freehand sketches of things—as they appear—are insufficient to reveal their hidden constitution, and will probably of himself make sketches of the internal economy of the apparatus which he attempts to describe; that is to say, he will attempt to draw in section. Then he must be shown how to select his points of view for external sketches and his planes of section for sectional drawings, so as to secure a complete description of the thing represented. Provided with a rule, he should be taught to measure his model and to mark the dimensions properly and systematically on his drawings. For many purposes such dimensioned sketches, if executed with reasonable care, would suffice, but for planning and taking out quantities accurate drawings to scale are frequently desirable, and for marking off work on the bench a certain amount of geometry is essential. It is unwise at the commencement of his training to attempt to cram an apprentice with Euclid or the ordinary problems of practical geometry. Let him first become conscious of his need of geometry in his every-day work and be interested in his freehand sketches, and then let his geometry gradually grow out of his freehand drawing. The apprentice will very soon appreciate the advantages afforded him by straightedges, squares, compasses and scales, and will take pleasure in the solution of a geometrical problem when he has tried in vain to discover it for himself, not because the problem was given him as a kind of conundrum by his teacher, but because it arose out of his own necessities.

Simple problems in mensuration (or workshop arithmetic) will also force themselves on the notice of the apprentice at an early stage, and here I may point out that an intelligent approximation to a numerical quantity is far more valuable than 15 significant figures all accurately obtained, but with a painful doubt as to the position of the decimal point. It is well to know that the volume of a sphere is represented by four-thirds πr^3, where π stands for 3.141592653589793.., but for many purposes it is more useful to know that the volume of the sphere can be found approximately by taking one-half of the cube whose edge is the diameter of the sphere, and adding 5 per cent. to that half; in other words, by taking twenty-one-fortieths of the volume of the cube.

The same general principles of utility and practical applicability should guide us in the teaching of mechanics. In this subject very little should be attempted without experimental illustration, and this, as far as possible, conducted by means of workshop appliances and not with the models of the scientific instrument maker. * * * *

PROPERTIES OF HEAT AND WATER.

Then we naturally pass on to other problems in connection with heat; the expansion of water on freezing, the forces which may be called into play by this expansion, amounting to a pressure of 75 atmospheres or 1125 pounds per square inch for each degree Fahrenheit through which the water is cooled below freezing point. The arrangement of water supply so as to prevent the bursting of pipes through frost, the heat absorbed by water in becoming steam and given out again when the steam is condensed, the heat required to warm a cubic foot of air through any range of temperature, and hence the amount of steam or hot water required to warm the air which forms the ventilation current in our rooms and assembly halls. Then we come to more difficult problems in mechanics, such as pressure and its relation to head of water, velocity due to head, the momentum and energy of a moving column of water, the water seal of a trap when the water is at rest, the conditions under which water seals may be broken in consequence of the energy of the moving water, the waving out of traps, and the necessity for after flush, the pressure of the air, the principle of the barometer and the syphon, the action of the different classes of pumps, the pumping of hot water and the effect of the vapor pressure on the suction, the high pressure in front of a moving column, and the low pressure or suction at the side and rear, illustrated by the injector, the ejector, and its modification in the Banner cowl, the importance of this action in the arrangement of traps, the syphoning out of traps and the methods of preventing it, the use of the air pipe, shocks due to inertia, the necessity for screw valves on a high-pressure service, the air vessel applied to the force pump or lift pump, and the action of the hydraulic ram. All these points require the mastery of only two or three simple principles, which must be put before the apprentice in the most homely language, and illustrated by means of the most familiar examples and simple experiments.

The resistance of pipes to the flow of water and air and simple calculations of the flow through a given system of pipes under a given head or pressure should form one of the subjects for the most advanced class when preparing for the masters' certificate.

CHEMISTRY AND PHYSIOLOGY.

A little chemistry may well be introduced at an early stage; the experiments used to illustrate the teaching are sure to attract the students, and few subjects are of more importance to the plumber than an understanding of the most elementary principles of chemistry. Combustion and its products, the effects of combustion and respiration on the air, water and its chief impurities, soft and hard water and their action on the metals used by plumbers, the chemical properties of lead, iron, copper, tin and zinc, the action of dry and moist air and of the products of fermentation on these metals, solders and fluxes, and the methods of purifying solders; all these subjects may be taught without an undue amount of extraneous matter, and yet the teaching may be firmly based on fundamental principles. To the mind of every practical plumber many other points will suggest themselves, all of which may advantageously be introduced into the teaching of the evening class, because it is impossible to treat them adequately in the commercial workshop.

But, in addition to knowing how to design and carry out his work, it is very desirable that the plumber should understand why all the precautions which he has to take are necessary, and be able to give a reason for everything he does. The object of his work is to maintain the human machine in health and comfort, and he ought, therefore, if only for his own sake as an intelligent being, to know something of the construction and mode of working of the machine itself. The elementary principles of physiology, especially with respect to respiration, the composition of pure and refined air, the analogies between an animal and a steam engine, and the points of difference, the quantity of air required to secure healthy conditions, the heat produced by com-

bustion within the animal body, the nature of ferments, and of zymotic diseases, the natural history of germ poisons and the influence of contaminated air and water on the spread of disease, are subjects which, if the plumber is to be a man, and not a machine, must be of vital interest to him. The same remark applies to the history of the materials which he uses in his every-day work. The ores of lead, copper, zinc, iron, tin, &c., and the methods of obtaining the metals and preparing them for the market, are subjects in which every apprentice should be interested, and which he may fairly claim to be taught in the technical class.

SYSTEM OF CLASS TEACHING.

The chief point to aim at in the training of the plumber is, however, not the introduction into his memory of so much information, but the formation of those habits of thought which will lead him to look at a question from every possible point of view, and even consider what will happen under contingencies which may be very remote, though possible. This habit of mind is the highest aim of education, and the chief problem of the teacher is how best to produce it. For this purpose it is doubtful whether any other method is equal to a well-designed system of class teaching. A sketch of some arrangement which is faulty, but the faults of which are not at once obvious, is shown to the class and the members are asked to point out the defects. If they fail to discover them the teacher helps them by "leading questions," taking care only to guide their thoughts to the discovery and not to reveal the answer. In this way the apprentices are led to think of what will take place under every condition to which the proposed arrangement may be exposed, and a habit of looking at a problem from all sides gradually grows in the pupils' minds. Erroneous views expressed by members of the class only afford opportunity to the teacher to guard his students against such errors, and frequently open up new fields of discussion. To make such a class successful the teacher must be equal to any occasion that may arise, and if questions are asked which he is unable to answer he must honestly say so. It is far better to postpone a question for consideration after further study than to give an answer which the students at once perceive to be shallow and evasive. There must also be the greatest confidence between the teacher and his class, and perfect freedom of speech, with only such discipline as is necessary to avoid waste of time.

PRACTICAL INSTRUCTION TO ACCOMPANY THEORETICAL.

In the majority of cases, it has been deemed desirable to associate with the lecture or class-room teaching a certain amount of practical work in a shop connected with the educational institution in which the class meets. In this workshop the teaching can be illustrated in a way which is impossible under the conditions which govern a commercial establishment, and special attention can be given to those operations in which the apprentice finds his greatest difficulties. For practical work, the class meets for, perhaps, only three or four hours a week during the winter, but the teaching thus provided may be made of very great value for the illustration of the ordinary class teaching and as supplementary to the regular workshop training. Isolated from these it is valueless, and may be pernicious. As a rule, it takes a young plumber four or five years of continuous work at something like 54 hours per week to become even moderately proficient in his craft, and even then he cannot rank as a first-rate operative. This being so, it is obviously absurd to suppose that the handicraft can be taught in a practical class which meets for only a few hours during the winter session. Possibly by such attendance a boy may be taught to wipe a joint; but to let loose upon the world a number of men who can pronounce that shibboleth of the plumber's craft, but are ignorant of the principles of sanitation, and of all the other branches of handicraft necessary to make a complete plumber, is a sin against society, and one fraught with the greatest possible danger to the public health.

Chicago Master Plumbers.

The first regular meeting in July of the Chicago Master Plumbers' Association was held at their rooms, 197 Madison street, Monday evening, July 10. The only business of importance transacted was the ratification of the resolutions adopted by the National Convention at Milwaukee.

New York Trades School.

The catalogue of the New York Trades School for the thirteenth season, which commences October 16, is just being distributed. The front cover shows a half tone engraving of the school building at First avenue, Sixty seventh and Sixty-eighth streets, New York, and gives a list of the trades in which instruction is given in the evening and the day classes, with the statement that the work done by the pupils of last season can be seen on week days and Sunday afternoons. Names can be entered for the different classes beginning October 2, on payment of the fees. A list of the trustees and trades school committees is followed by a short history of the school, the Auchmuty system, its intentions, methods and success. Half tone engravings are used in connection with the different trades to show the high character of the work of which the graduating classes are capable.

Evening classes will receive instruction Monday, Wednesday and Friday evenings from 7 to 9.30 o'clock, the age at which applicants are received being limited, varying from 16 to 18 up to 21 to 24 years, and the fee for the course ranges from $12 to $25. Evening instruction begins at stated dates, and is given in bricklaying, plastering, plumbing, carpentry, house painting, stone cutting, fresco painting and blacksmithing. Instruction will be given to day classes in plumbing, house and fresco painting, sign painting, printing, carpentry and bricklaying. The fee for the course varies from $25 to $40, and the hours from 8 a.m. to 4 p.m. and 2.30 p.m. on Saturday.

The plumbing class is under the supervision of the Trade School Committee of the Master Plumbers' Association of New York, who have appointed John Delehanty superintendent of the plumbing department. Manual instruction will be given in 16 different kinds of work and in miscellaneous work where sufficient proficiency has been made. Scientific instruction will be given on the proper arrangement of service and waste pipes and drainage and ventilation under eight separate heads, followed by miscellaneous instruction. At the end of a course, the committee will examine the class, to ascertain their manual skill and scientific knowledge, when, if entitled, certificates will be given. Each pupil is furnished with a set of tools; has a place allotted at a work bench, receives careful instruction from skilled mechanics, as to the manner in which work should be done, with reasons therefor, and who see that it is done neatly and in a workmanlike style. Great care is bestowed on the scientific course of instruction, a printed form, giving questions with space for answers, being furnished each pupil. After the instructor writes the correct answer on the blackboard, it is copied by the class and its full meaning discussed. Diagrams of improper work are given for correction and afterward these become, with the blanks, the property of the pupil.

The same careful course is pursued in each of the other trades. A tribute is paid to the master associations in different lines of trade for the assistance rendered the school. Four thousand one hundred and fifteen young men have attended the school from 38 different States and from Canada. A plan and view is given of the lodging house erected to accommodate pupils, which provides comfortable rooms reasonably, the only restriction being that all lodgers shall be in by 11.30 p.m. An interesting feature is a four-page sheet that accompanies the catalogue, which contains extracts from letters received from pupils of previous seasons relating their success in getting work at wages which highly commends the efficiency of the school.

TRAPS AND VENTS.

L. L. CAMP, New Haven, Conn., one of the directors of Peck Bros. & Co., is in Chicago visiting the World's Fair.

THE HENRY HUBER COMPANY, dealers in sanitary specialties at New York, Boston and Chicago, have issued a very handsome volume of 206 pages, illustrating and describing in a brief manner the line of plumbing goods manufactured by them. It is known as Catalogue C, and is substantially bound in stiff board covers. Water closets are shown in many different styles of hard wood cabinet finish; cisterns and seats, plain, embossed and decorated earthenware, lavatories, bathtubs, earthen laundry tubs, sinks, urinals, &c., are shown complete; also the separate fixtures only. Decorated wash basins are illustrated in colors. Particular attention is directed to Boyle's pneumatic closets.

THE STANDARD MFG. COMPANY, Pittsburgh, Pa., take considerable pride in having furnished enameled bathtubs, lavatories, water-closets and complete outfit for several bathrooms for a residence, whose owner had been looking up plumbing goods in a number of large cities. With some recent changes their capacity for turning out enameled baths runs up considerably above 100 every day.

AMONG the members of the Arion Society of Brooklyn recently visiting the World's Fair was Arnold Beher, manager of Peck Bros. & Co.'s New York branch.

The naval gun cotton factory, recently burned down at Newport, will probably be rebuilt. Gun cotton is the high explosive of our navy. It is used even in the shells of the "Vesuvius," although she continues to be called a dynamite cruiser. Hence it is desirable to keep up the arrangements for producing it to a high state of efficiency. Besides, excellent experimental work is done at Newport, so that in the great future of high explosives it is necessary that the Navy Department should have the best appliances at its command.

The Foundrymen's Association.

The regular monthly meeting of the Foundrymen's Association was held at the Manufacturers' Club in Philadelphia on Thursday, July 6, Thomas Devlin of Thos. Devlin & Co., Philadelphia, occupying the chair in the absence of the president. The attendance was not so large as at previous meetings.

The minutes of the last meeting were read and adopted.

The Executive Committee reported that at its last meeting some discussion took place in regard to the circular recently issued by the association to other associations formed and forming, and it was finally arranged to await answers from all points, no action in the meantime to be taken and no departure from the usual proceedings of the association to be made It was desirable, however, that the association should help other bodies in any way possible calculated to benefit the foundry trade all over the country. As to the state of trade, the report stated that almost every foundry had taken steps to reduce the cost of production, although the price of labor remained the same as for years and was an important factor in the case. It seemed as though something should be done to make both ends meet at the end of the year. At the low price of castings in the open market it would seem that the only remedy would be a reduction in the cost, or a higher price for the products. The committee invited discussion upon the report.

The Special Committee, which includes the Price Committee, then reported by sections. P. D. Wanner of the Mellert Foundry & Machine Company of Reading, Pa., representing the iron-pipe trade, reported that in that line the trade was holding its own very well under the present condition of affairs in the country. Pipe foundries, so far as he knew, were pretty well filled with orders, and were particularly pressed on some sizes of pipe. Prices remained about the same, although they may have run a little higher occasionally on sizes for which there was not a usual demand, but in general the prices were not as good as the demand would warrant. He supposed the condition was in keeping with everything else at the present time. Everybody seemed afraid to ask anything like a fair price or profit for their productions. A year of low prices would seem to be ruling very generally. In the East founders were a little timid on account of the Southern pipe makers. The condition of the market in the East might have warranted an advance in prices, but the life was knocked out of the trade by the low prices at which Southern founders were offering. Pipe was being delivered all through the East as far as Bangor, Maine, by Southern pipe founders, and in some points it had been offered at prices at which Eastern founders could not begin to produce. This competition, he said, of course tended to promote timidity, and sales were being made bearing the smallest possible profit in order to keep foundries going and men employed.

E. E. Brown, of E. E. Brown & Co. of Philadelphia, representing the sash weight section of the committee, in reporting for his section said that he was glad to say that a little improvement was noticeable, but there was still room for a large improvement, particularly in the New York market. In the Philadelphia and New England markets prices were fairly good, he might almost say profitable. In the New York market they were, if anything, lower than before.

Stanley G. Flagg, Jr., of Stanley G. Flagg & Co. of Philadelphia, representing the malleable iron castings section of the committee, had nothing to report. The trade was in bad shape and there had been no change of late.

R. A. Register, of Register & Sons, Baltimore, representing the cast iron soil pipe section of the committee, reported that the demand for stock continued good. He said that in view of the high quality of soil pipe required for the Philadelphia trade in order to comply with the sanitary regulations, an arrangement had been arrived at between the manufacturers for the purpose of elevating the standard of their respective manufactures. The arrangement come to will go into effect at once and necessitates an advance in prices.

The Riehlé Bros. Testing Machine Company were elected to membership in the association.

The secretary announced that Dr. Kirk, who had arranged to be present at the meeting and deliver an address on the subject of "Melting and Fluxing in Cupolas" had not appeared, and his absence was unexplained. There was present, however, Wm. C. Henderson, chemist for Thos. Devlin & Co., who would address the meeting on a subject of interest to all present. Mr. Henderson then addressed the meeting on the subject of

Chemistry as Applied to the Iron Foundry Industry.

He said: I have been requested to address you this evening upon the subject of "The Value of the Chemist's Services as Applied to the Iron Foundry Industry."

The methods employed by the chemist in arriving at conclusions are so imperfectly understood by the laity that the manufacturer of the crude products of iron is not always in a position to decide whether their adoption would be of advantage to him or not. I qualify the statement in this way, because in the higher branches of iron and steel making the chemist's position is of such recognized importance as to render impossible all thought of operating without him. I am persuaded that in the case of many foundrymen there exists a strong prejudice against any departure from their time-honored manner of running their foundries, which predisposes them to regard the work of the chemist as being an expensive theoretical nicety incapable of practical results of the character in which they deal. It would be well before passing judgment for each foundryman to ascertain just what the chemist can do, how he does it, and whether the same ends may be achieved in any other way. Investigation will show that in forming his deductions the chemist's mode of procedure is singularly simple, reasonable and practical. As a result of years of exhaustive scientific experiment, theory and actual practice, the records of which are most complete and voluminous, it is known that certain impurities in material produce certain characteristic effects upon the physical behavior of manufacture resulting from its employment, that certain combinations of impurities produce certain other effects, and that in the process of conversion, which is in every case a chemical one, these impurities may be eliminated, retained or forced into combination with others according to fixed laws and conditions to which they are subject.

I use the word impurities in its strict scientific significance, and it is not to be supposed that their presence is in every instance objectionable; for while the existence of some is attended with wholly injurious results, and the abnormal content of any is productive of pernicious consequences, it is at the same time due to the properly adjusted proportions of others that desirable requirements are met that would otherwise be impossible. To properly adjust these proportions to effect the physical constitution demanded in the final product calls for ability of the highest order; for the line, on either side of which an element may not enter into its composition without disaster, is not always clearly defined. The influence exerted by other elements present, in neutralizing or augmenting properties identical to one, and the modified reactions occasioned by a change of conditions—such, for instance, as conducting the operations in newly lined vessels—are mere hints as to difficulties presented; and it is in the solution of this problem that the chemist's capacity is unique; for equipped with this knowledge he proceeds to determine, with absolute accuracy, to what extent these impurities exist in the material at his disposal, and he causes at will their ultimate dispensation in accordance with the physical end toward which his efforts have been directed. This undertaking is, indeed, so formidable that one may well pardon, in those not familiar with the possibilities in the manufacture of the higher grades of iron and steel, skepticism as to its achievement. A glance, however, at the specifications to which the metal used in the construction of our nation's ordnance must conform will dispel any doubt in the matter, and this is but an instance of requirements the every-day fulfillment of which is made possible by the work of the chemist.

To the iron founder, perhaps, among the more direct and comprehensive advantages that would follow the employment of a chemist would be his ability in the purchase of material; to intelligently take advantage of low prices, and in only acquiring such as would be best adapted to his purpose; to tell whether or not he could make use of a material and what results would take place in the event of its use—and this, be it remembered, before the material in question is even purchased; to exactly reproduce physical qualities in manufacture, without using any of the original material, and in affording protection generally to the founder against deception; for, under the chemist's inspection, it does not suffice that certain material should have a good reputation simply, it following, of necessity, that such material must stand upon its intrinsic merit. Occasions are not wanting where imposition has been practiced in furnishing material of good quality until the reputation of the brand is fairly well established, when material of an inferior nature has been substituted.

Any attempt of this kind, where the material is subjected to chemical examination, would result in instant detection. I include under the general head of "material," pig iron, iron scrap, fuel, brick, clay, sand, oil and in fact everything used about a plant that is liable to any variation from a fixed standard or in which certain qualities are desired. In enumerating the many advantages

accruing to the iron founder from the employment of a chemist, it is presupposed that the work is in the hands of one who is in every way qualified and experienced, and who embraces also a thorough knowledge of metallurgy; that an unstinted equipment of the necessary apparatus, &c., is furnished him; that every reasonable facility is afforded him to properly carry forward his work, and that due attention is given to physical as well as to chemical testing, for it is only in their joint application that the full value of the chemist's work is realized in its entirety.

A word touching the relative value to the iron foundryman of physical as compared with chemical testing may not be out of place here. It must be obvious to all that the actual service to which manufacture is put when occupying the position for which it was made, constitutes the most complete physical test that it is possible to conceive, and as the chemist's knowledge has, in the first place, been derived from, and his sole aim is, in the last place, to meet, this test, it might be said that he is wholly independent of any system of tests other than chemical ones, and it could be so said with truth so far as present knowledge is concerned. But as the limit to learning has not yet been reached it is as an aid in advancing his information into unknown fields that physical testing is most essential to him; though of course, it is of great importance in checking his work. But what of permanent avail is accomplished by the application of physical tests to material the chemical composition of which is unknown. The very utmost that can be hoped from such tests is to establish the fact that a definite lot of material in hand is either good or bad. But absolutely nothing has been gained toward the estimation of future lots, every parcel of which has to be heated in the same aimless way, whereas a fact once established by chemical research remains fixed for all time. When it is known that a certain percentage of an element in a material under certain conditions produces a certain physical effect, every time these conditions are reached in this material having the same percentage of the element this identical physical effect is obtained and no other.

Some may argue that, because in supplying at a profit manufacture to the satisfaction of their customers, there exists no need for a change in their business policy. This sort of reasoning, aside from its inconsistence with the progressive spirit of the times, by no means shows that their output is the best that could have been produced at the same cost. That their customers are satisfied may simply be the result of their ignorance as to higher possibilities in such manufacture, and enlightenment in this matter will, doubtless, bring with it a corresponding loss of custom. The various shifts practiced by the iron foundryman with a view to estimate the value to him of certain material appear grotesque in comparison with the methodical system employed by the chemist, and I believe that very little is attempted beyond the testing of pig iron. In this instance the custom seems to be to charge a new iron, and if the resultant castings look all right the iron is considered good and is put on the list of good irons; but should the entire work of the molder be destroyed and a lot of metal to be remelted be the outcome, then the iron is regarded as bad, and that brand is to be ever after avoided.

This very often causes gross injustice to be done to the pig iron producer, for if it proves anything at all it simply shows it with relation to that particular lot of iron used, it being quite possible for the iron from the same furnace to be at one time in every way suitable for a certain purpose and at another totally unfit for use in like manner. But I go so far as to say that whatever the outcome of this test it need not necessarily prove anything at all; for in event of a satisfactory result by this test from the use of a certain iron, it is possible that the iron in question might still be such as would be unsuited to the founder's peculiar purpose, but has, in the process of melting, neutralized the effect of another iron in the mixture equally as undesirable from an opposite cause, and the effect has been due to mere chance, and *vice versa*.

It must be within the experience of every foundryman that dire results have taken place, even though he was using material with which he thought himself perfectly familiar and for which he is perhaps unable to account even to this day. He should bear in mind that impurities in his fuel and other material besides pig iron play a most important part in his operations; and, although these have not entered into his caculations, such failures may be directly attributable to their abnormal existence. Many foundrymen are wont to lay great store by a name, and certain brands of iron are known to them as good irons or bad irons; indeed, in some cases a particular brand of iron is believed by them to be absolutely essential in the manufacture of their castings. Certain wily pig-iron men practice upon this delusion and obtain $1 or $2 more per ton for their iron than it could be advantageously replaced for by a vastly superior article.

The fallacious nature of the belief that because an iron of a certain name has at one time given good results the same good results will always follow its future use, will appear when it is known that the variation, in even the same cast of pig iron, is sometimes considerable. Pig irons are commonly spoken of among foundrymen according to some physical quality which they possess, such as "soft," "strong," "tough," &c. They do not know what causes these irons to possess these physical qualities, but, by their demand for them have forced the pig iron producer to learn the cause, and in his effort to meet this demand have rendered the presence of the chemist at the blast furnace of almost universal necessity. At the mines he is indispensable, because the ore is sold according to the percentage of iron or other metal contained, and its freedom from deleterious impurities has considerable bearing upon its value. That he is not in more general demand among iron foundrymen would seem to speak well for the hitherto profits in the business, but as each year brings with it a demand for lower prices it is only a question of time when the manufacturers in this important industry cannot afford to make needless mistakes, and the chemist's identity with the iron foundry will be assured.

In each progressive step advanced in the development of iron, from its first imperfect reduction from its ores to the production of the nickel-steel armor plate which causes to crash into harmless fragments projectiles hurled with the most destructive force of which man is at present capable, chemistry has played a part second to none. In a word, every change that comes over iron in passing from one state into another is a chemical reaction, and to whom could its conduct be better intrusted than to the chemist?

At the conclusion of the address Mr. Henderson was tendered the thanks of the meeting.

Walter Wood of R. D. Wood & Co. of Philadelphia said it had always been a puzzle to him why chemists were not more useful to iron founders. Not that the iron founder was ignorant, but because of the elements or impurities to be found in pig iron. Founders remembered an iron that had plenty of phosphorus in it or a large amount of manganese or sulphur, and they avoided it. What they required was a No. 1 pig iron carrying a certain amount of carbon and silicon. In running a blast furnace the first three elements were elements which largely controlled the furnaceman's operations. The questions of carbon and silicon, elements which a foundryman mostly depended on, were conditions which a blast-furnaceman could not closely guarantee. Besides the assurance that there was no sulphur or other product deleterious to manufacture in the iron, it should be shown exactly what was the silicon and carbon in it in order to enable the foundryman to handle the metal carefully and understand it. To employ a chemist in a foundry without such assurance from the blast-furnaceman meant an analysis of almost every cast and every carload. Foundrymen were in the habit of judging as to the carbon by the color, and probably thus came to the conclusion that a chemist was not as useful as he might be, and trusted to the mixing of three or four different irons to strike an average, letting the mixer reduce that average to as near a certainty as possible. He would be glad to be corrected and have some light thrown on the question.

Mr. Henderson, in reply, said that a chemist could make any grade of iron desired, accidents excluded. The question of shrinkage was the main question a foundryman had to deal with. If the melting point of wrought iron was compared with the melting point of cast iron there would be found a marked difference in the number of degrees of heat necessary for the melting. It should first be ascertained what occasioned that tremendous difference, and a chemical analysis would reveal the fact that one was almost pure iron while the other contained what might be termed impurities. It was fair to suppose that the impurities were the cause of the change in the melting point. Certain impurities were found to be deleterious, such, for instance, as manganese, sulphur and others. In fact they would be objectionable unless handled with great care. Silicon had the effect of correcting shrinkage, for the reason that it had been ascertained that the purer the iron the greater the amount of heat required to melt it. It was a natural law that all bodies contract on cooling and expand on heating, consequently the greater the heat the greater the expansion. The farther apart the atoms of metal get when in a melted state the greater distance they had to come together in cooling. This was shrinkage. If the temperature of the metal could be reduced to the smallest possible degree and the metal held in fluidity, then would be reached the highest point from which shrinkage was to be ascertained, and in consequence the chemist selects an addition to the mixture considered to be the least deleterious to effect a reduction in the melting point of his metal. If he goes too far and uses too much silicon he

causes the article manufactured to be extremely brittle. Silicon has a tendency, when existing in high proportions, to make an article of low tensile strength, therefore it is necessary to know how far to go when using it.

P. D. Wanner thought that it was generally believed that the pig iron of the present day was not as good as it was 10 or 15 years ago. That was the opinion prevailing at Reading. Producers were careless as to the quality of ore melted and were forcing their furnaces with the object of turning out as large a quantity as possible without regard to quality, on account of the low prices current. This being the case, it became more important for the foundryman to mix his iron or to get to understand his iron so as to bring about good results. Silicon was very necessary in the iron used for making pipe, particularly in the larger sizes, so as to prevent undue shrinkage, and it could not be dispensed with. Iron possessing a good deal of that element was required. Too much caused the pipe to become brittle and thus entail a great deal of trouble, as he knew by experience. He had had trouble with a certain brand of iron which ran hard and white. He would like to know what was wanting in that case.

Several things, Mr. Henderson said, would cause iron to run white, sulphur having a remarkable effect. Sudden cooling would also cause the condition. It was likely, too, that the iron was low in graphitic carbon and high in combined carbon. Change in the temperature in melting when the iron contained a small amount of graphitic carbon would cause it to run white.

Mr. Wanner presumed that to meet the case it would be necessary to add another iron to the mixture sufficient to supply the deficiency existing.

Stanley G. Flagg, Jr., said that he had long intended to raise the question among members of the association as to whether it would be practical or possible for the association to go more fully into the technical part of the foundry business. He could not imagine a man melting a small heat of iron affording to employ a chemist. In Germany, foundrymen's associations such as this have technical connections. They sometimes employed a molder of large experience, and members requiring advice paid him for it at a rebate on fixed charges. In that way small consumers derived much benefit from the associations not otherwise available to them. If the membership in this association would combine and carry out a line of investigation it would prove very beneficial to all, and would result in information not open to individual members.

Mr. Wanner had no doubt the Executive Committee would be glad if the association would give the subject some thought. To have some one in the interests of the Foundrymen's Association to whom members with business large or small could turn for information was an idea worth following out. He supposed it would require something in addition to the ordinary fees of members to attain this end, but as one of the Executive Committee he should be glad to see what could be done.

After much discussion the matter was referred to the Executive Committee.

Mr. Wanner then stated that the Chamber of Commerce in New York, at a sitting that afternoon, had taken action in favor of the repeal of the Silver bill. A resolution, he said, was also passed that all boards of trade, industrial and commercial associations be asked or requested to take up the matter and express their views on the subject. He was of the opinion that the Foundrymen's Association had secured a very good foothold, and he saw no reason why its members should wait until they were asked to act in the matter, or why they could not, to some extent, take the lead in that direction. He thought they should help the matter along. Doubtless, all were rejoiced to know that Congress would meet in August, instead of September. It was obvious that they were passing through a crisis which had already hurt a good many of them, and the end had, possibly, not yet been reached. The general opinion prevailing appeared to be that the Sherman silver law was a bad law and had induced the present condition of financial affairs, and, therefore, the sooner it was repealed the better it would be for all. He submitted the following resolution:

Resolved, as the sense of this association, That we respectfully urge upon Congress, when assembled, the immediate and unconditional repeal of the silver-purchasing clause of the Sherman act.

After some discussion, the resolution was put to the meeting and carried unanimously.

A motion was then made that the resolution be sent to the Speaker of the House under the seal of the association and the signature of its authorized officers.

The secretary, Howard Evans, announced that the Western Foundrymen's Association held their first meeting in Chicago on May 25 last. The association was permanently formed and was following very closely the proceedings of this association. In regard to the circular sent to them inviting discussions and comparisons on subjects of interest to foundrymen in general, he was advised that the new association would be carried on separately and on its own basis, but would feel itself in touch with this association and be perfectly willing to send information on any subject which it was in their power to give. He had written their secretary stating that this association was national in character and both willing and anxious to help any association in the United States, with the idea of furthering the interests of the foundry trades. If after a time all the associations were found to proceed satisfactorily it might be found desirable to have a meeting on a large scale.

The meeting then adjourned.

What is claimed to be the largest girder ever shipped in one piece has been put in place in the new Broad street station of the Pennsylvania road at Philadelphia. It is 58 feet 1 inch long, 10½ feet in hight, and rests on a plate 2 feet 6 inches broad. The Philadelphia Bridge Company, its makers, claim that this giant, weighing 110,780 pounds, is the heaviest and largest steel girder ever turned out complete by an iron works in the United States. The girder is placed across Fifteenth street, on the south side of the station, and is designed to support the weight of the seven stories of brick of the office building on the Market street front.

The advisability of using sand filters in the Croton watershed, from whence New York receives its water, is now being considered. Although filter beds are used in England, there are none in this country built on a large scale.

FLASHINGS.

According to newspaper reports, a Tinners and Cornice Makers' Union was organized at Greenfield, Ill., on the evening of June 30, this being, we understand, the seventeenth union of this craft organized in the State. The officers are: Nicholas Smith, president; Peter Gillick, vice president; Herman Tittman, recording secretary; Frank Kibele, financial secretary; Frank Keys, treasurer.

A series of photographs from W. H. Mullins, Salem, Ohio, show some sheet-copper statues of Comedy, Music, Painting, Poetry and Sculpture for the Teatro Juarez, Guanajuato, Mexico. The statues are ten feet and the photographs convey the impression of superb workmanship and beauty, and they will doubtless prove very imposing ornaments to the building. High art in metal work is proved possible by the productions of this plant, and the satisfaction expressed by the patrons is incentive to continued effort in that direction.

Among the late contracts taken by J. C. McFarland, 2511 to 2519 State street, Chicago, can be mentioned the slate roofing, of which about 2500 squares will be required; gutters and conductors for the 25 buildings erected by the Whitman & Barns Mfg. Company at West Pullman, Ill.; copper, galvanized iron and tin work for the Market Hall at Pullman, Ill.; copper work and slate roofing for Medina Temple, Jackson street and Fifth avenue, Chicago; copper work and 225 squares of slate roofing for the Court House at La Porte, Ind.

S. D. Hicks & Son of 65 Merrimac street will remove about September 1 to 9 to 17 Bowker street, Boston, Mass., where they will have greatly increased facilities.

Neponset water-proof paper, the Cushman metallic shingle, Kanneberg's slip-joint eave trough and Kanneberg's patent folded lock seam steel roofing, with a variety of designs for siding and ceiling in iron and steel, make their way to the trade over a wide section from Canton, Ohio, where the Kanneberg Roofing Company have a well-equipped manufacturing plant.

J. H. Eller & Co., Canton, Ohio, have a fine plant right on the railroad, and an order for steel roofing, siding, ceiling or any of their specialties is apt to make a part of the next out-going freight.

The Columbia Roofing Company, Canton, Ohio, are acquainting the trade with the construction of their new and patented Columbia steel roofing by mailing a small section of the standing seam with their catalogue, which explains not only this specialty but their general line of siding, and eave-trough and conductors.

Much study is now being devoted to the question of oil for fuel for ocean steamships. The "James Brand," during a recent voyage across the Atlantic, used petroleum for three days and found it satisfactory in every water. The oil was fed to the furnace by means of jets of steam. The "James Brand" is of 3780 tons register, 345 feet long, 43½ feet beam, 29 feet deep, and is furnished with triple-expansion engines. The experiment will be continued, and if found to be of advantage petroleum will be used exclusively.

THE TIN SHOP.

Pattern for Two-Piece Elbow.

From B. E., *Baltimore.*—In the accompanying diagram is shown my "shop" method for obtaining the pattern of a two-piece elbow. In the diagram let A B C D represent the piece of iron intended for elbow. The allowance for joining is indicated by the lines E F and H G. Then E H represents the circumference of elbow. Let J K L represent the half profile, which is struck from the center M. Divide J K L into any convenient number of equal parts, as shown by the small figures. Divide the circumference E H into twice the number of parts as was the half profile J K L, and from the points thus obtained draw the usual measuring lines. From the points in J K L draw lines parallel with A D, cutting measuring lines of similar number, as indicated by the dotted lines drawn from points in J K L to lines of similar number in J N. These lines can be continued to similar lines in N O. By tracing a line through the points thus obtained, as indicated by J N O, the desired pattern is secured.

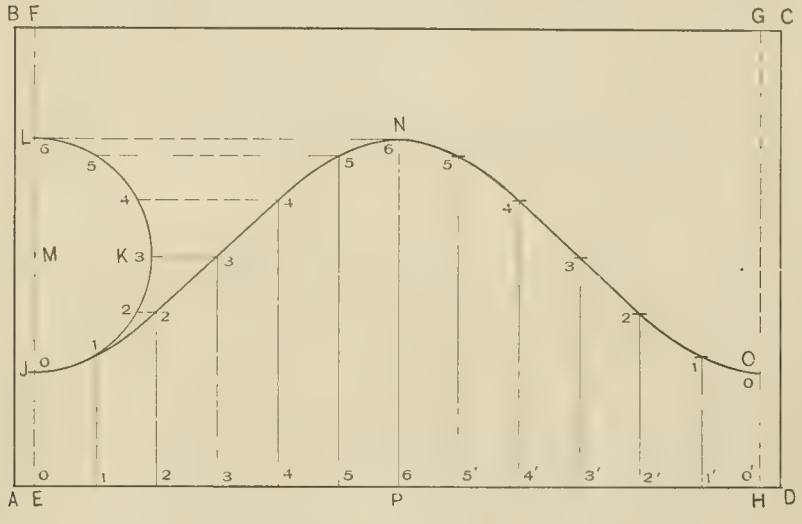


Fig. 1.—Method Suggested by "B. E." of Baltimore.

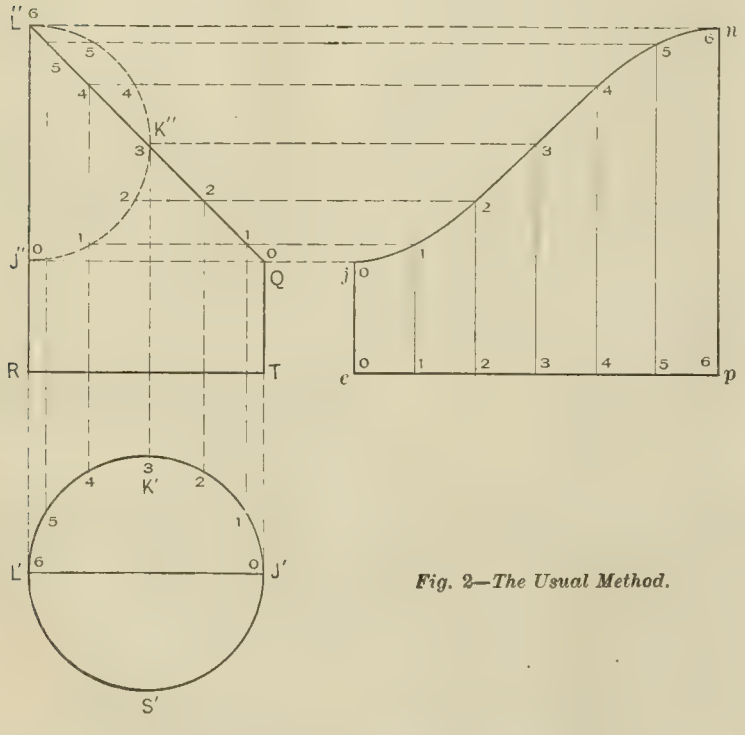


Fig. 2—The Usual Method.

PATTERN FOR TWO-PIECE ELBOW.

The usual method for obtaining the pattern is shown in Fig. 2. In this figure let L' K' J' S' represent the profile and R L'' Q T the elevation of one part of elbow, the diagonal line L'' Q representing the joint. To obtain the pattern, divide the profile into any convenient number of parts, and from the points thus obtained carry lines parallel with R L'' cutting the miter line L'' Q. On R T extended, as *e p*, lay off a stretchout line of whole or half of profile, divided into the same number of parts as the profile. In the present instance the half pattern only is shown, consequently *e p* represents the stretchout of L' K' J'. Through the divisions in *e p* draw the usual measuring lines. Carry lines from the points in miter line L'' Q, parallel with stretchout line *e p*, cutting corresponding measuring lines. A line traced through these points, as indicated by *j n*, will complete the half pattern. The other half can be obtained in a similar manner or by duplication. In this example we carry lines from L' K' J' of profile to the miter line L'' Q, and then from miter line L'' Q to the measuring lines. The same result is obtained by drawing lines from the divisions in the half profile J'' K'' L'' to the measuring lines, as has been done in Fig. 1.

A Test of Carpenter Shells.

A highly successful test of the largest armor piercing shells was held at the naval proving grounds, Indian Head, on the 5th inst. The shells were the product of the Carpenter Steel Company, and represented a lot of about 250 which the Government has contracted to purchase from that concern. The tests were under the personal supervision of Commodore Sampson, chief of the Bureau of Ordnance. Each shell weighed 850 pounds, and is intended for operations against armor. Such shells do not contain bursting charges, but cause damage by the force of impact alone. The shells were discharged against one of the several Creusot plates recently bought by the Navy Department for experimental purposes.

Only two shells were tested. The first had a velocity of 1300 feet a second. It penetrated 16 inches of plate and backing, rebounded and was found to be only slightly distorted in body. The second shell had a velocity of 1325 feet a second. It went through both plate and backing and fell 9 feet in rear of the target. It was practically undeformed when examined. In the contract requirement shells of this large caliber must, to be acceptable, go through plates without serious distortion or break. Both shells used met the requirements in a satisfactory manner, and the lot which they represent will be accepted.

Official returns for the middle of June published by the German Government show that the outlook, which was not very bright before then, has become very serious, particularly with regard to the hay crop. Some newspapers urge the suspension of import duties on fodder to follow the precedent established by France.

THE LETTER BOX.

What Is the Best Roofing Tin?

From B. S. K., *Syracuse, N. Y.*—I would like to have your opinion on the following. I have a specification reading thus: "Roof to be covered with 14 x 20 I C best roofing tin." Now I estimated on a Dean grade, worth about $6 a box, but the owner tells me I must put on a particular brand of the heavy coated guaranteed plate, that being considered the best in this city. I expect to fulfill the specifications and am at a loss to know what to use. One says Dean grade is considered the best, and cannot be construed to use what is known as an extra roofing plate like guaranteed plate. I also wish some of your readers would express their opinions in this matter.

Note.—The word "best" roofing tin can be read in two ways, as it may be considered of the usual run of plates, under which interpretation our correspondent is correct in taking Dean grade as fulfilling the specification. It is possible, however, in the local trade, the best plate may mean this particular brand of old-fashioned roofing plate to which he refers. In this case, local opinion would decide in favor of the special brand. When it comes, however, to claiming that one of the certain old-fashioned plates is the best, there would immediately be cause for endless dispute. There are several old-fashioned plates in the market, each of which is claimed to be the best, and to use one above the other when neither is specified by name would be making an invidious distinction. We think the most of our readers will agree that the highest grade of unguaranteed plate is probably what is meant in the specification. We would like, however, to have a general expression of opinion in this matter.

Trouble with Water Back

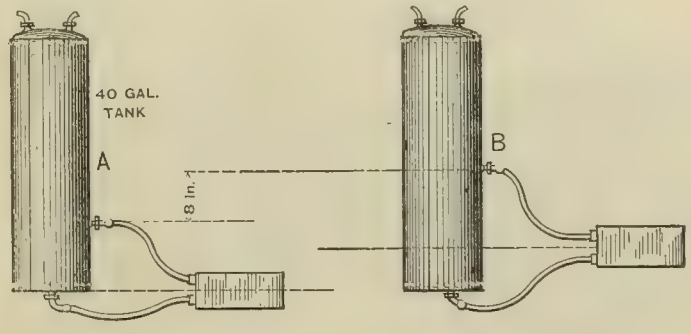
From J. P. & S., *Haddonfield, N. J.*—We would like to hear, through the columns of *The Metal Worker*, from some of the correspondents in regard to trouble we are having with a water-back used in a brick-set range at the back of the fire box. We have taken out the water back and thoroughly cleaned it; taken the upright boiler, which is located in the bathroom over the range, to the shop and examined it, and also put in a new copper tube. We have replaced everything in proper position, put in larger lead pipes, and yet, notwithstanding all this, the water back is so cold that you can lay your hands on it while there is a hot fire in the stove. The lady of the house told us that she does not get the water hot enough to wash dishes. Now, we would like to know if there can be anything in the iron of which the water back is made which keeps the heat from striking through it. The range draws all right, there being no trouble with the draft, and the stove bakes well; in fact, everything works satisfactorily except the water back.

Note.—If our correspondents had furnished a sketch, we might have discovered what the difficulty was with the heating apparatus. As a matter of fact, it is hard to believe that the iron can have anything to do with the heating of the water back. Iron always conducts heat, and if the arrangements are properly made and the water back of ordinary construction, we fail to understand why the heat does not go into the water. Nothing in the iron itself would interfere with its transmission. If any of our readers can offer suggestions, we would be glad to hear from them.

Heating Range Boilers.

From J. H. B., *Lincoln, Neb.*—Which one of the range boilers shown in the accompanying illustration will heat the water in the shorter time?

Note.—We have reproduced our correspondent's sketch in the illustration.



Heating Range Boilers.

The difference between the arrangement in plan A and plan B is that the water back is at a different hight and the return pipe is higher in the second case. We would like an expression of opinion from our readers on these two constructions, assuming that the water back is the same in both cases, and that all the connections are equally well made, by which we mean that there are easy bends and no obstruction in the pipes, and that the pipes are of the same size. In plan A, it will be noticed, the water back is below the bottom of the boiler, but the upper pipe is nearer the bottom than in the case of plan B. The fact that the water back is low would have a tendency to increase the circulation, but, on the other hand, the higher return pipe in B would tend to facilitate circulation. We would like to have the opinion of our expert readers as to whether the higher return or lower water back is of the greater advantage in promoting circulation.

Laying a Tin Roof.

From J. G. E., *Noblesville, Ind.*—In answer to the inquiry of "C. S. P.," in *The Metal Worker* of July 1, I advise him to lay his roof with all flat seams, one sheet at a time, and fasten the same well with cleats not more than 1 inch wide, for a wide cleat has often ruined an otherwise good roof. Where there is a fall I prefer a standing seam and I have no trouble here in Indiana with a fall of ¾ inch to the foot; 1½ inches is, however, better.

Trouble with Well Cooler.

From C. S. B., *Hanover, Pa.*—I notice in *The Metal Worker* of July 1 a sketch of a well cooler submitted by "P. R. F.," which has not given satisfaction. We have had trouble with several coolers in the same way and always found the difficulty came from a leak in the boiler or a leak in the pipes. The warm water coming through the pipes and leaking into the well, no matter how small the leak, will, in the course of a little time, make the well water the same temperature as the hydrant water. I think if your correspondent will take his boiler and pipes out and examine them closely he will find a leak somewhere. I simply offer this as a suggestion.

From H. W. W., *New York.*—In my judgment the difficutly met with by "P. R. F." of Virginia in his well cooler is due to its position. It should be stood on end with the sink drawing supply from the bottom and the feed entering at the top, with a return bend to prevent the water passing directly across the tank, which it, no doubt, does with the present arrangement, as the feed and discharge pipes are of the same size. When the faucet at the sink is opened the velocity of the water in the feed pipe is equal to that in the discharge, and, therefore, owing to the high speed of the water entering the tank, and the outlet being directly opposite, there is nothing to prevent it from passing through the tank in a direct and compact current. Its action is similar to that of the injector or water syphon. In any case, the supply should be at least 1 inch, with a return bend or scattering plate to check the direct currents.

Bathing and Washing Facilities in a Brooklyn Factory.

Increased attention is being paid to the proper heating, lighting, and ventilation of workshops and factories; employers recognizing that improved conditions in these matters, while ministering to the health and comfort of their work-people, tend also to their own advantage in inducing better work and more of it. This is all matter for congratulation, and very satisfactory so far as it goes. But there seems to be something yet to be learned in respect to the provision of better washing and other sanitary facilities, for, as a general rule, such provision falls far short of what it might be. Baths are rarely found in American factories, nor any facilities for washing out soiled clothes. Yet the advantages that might be gained, both by employers and employed, in the provision of such comforts are worth consideration. While improving the health and comfort of the men, the refreshment of bathing and enjoyment of clean clothes would undoubtedly give them a greater capacity and energy for their work; body and mind alike would be refreshed, and the refreshment would react upon their laboring qualities.

In Germany, as we understand, a system of baths and wash places has been adopted with much success in several factories, similar to that in use in the schools and public institutions of that country—namely, the shower or rain bath system. Results have, it is said, shown a marked improvement in the general health and working qualities of those using them. The special recommendations of this system are that it is more economical of space; and that men can get a thorough wash-down in a short time—from three to five minutes—with great economy in the amount of water used. It can also be introduced at a comparatively small cost; and, in large industrial establishments, would be found to be of great value to and appreciated by the workers, especially those in cities, where facilities for maintaining personal cleanliness at home or elsewhere are often very small.

This matter has, we understand, been in the minds of several employers of labor throughout the country, but various reasons have militated against its practical adoption. Among these employers is J. H. Williams, head of the firm of J. H. Williams & Co., the well-known makers of drop forgings of Brooklyn, N. Y. Mr. Williams, after long consideration and investigation, convinced himself of the material advantages which would result from supplying his men with bathing facilities, and accordingly decided to adopt the shower-bath plan as the best method for overcoming the objections as to cost, space, loss of time, &c., which in this connection were urged with reason against the bathtub system. Taking as his model the People's Baths of New York City, where the luxury of a shower bath, with towel and soap, is provided for the small sum of five cents, he built a similar bathhouse in connection with his works, which is the first on this principle yet introduced into any American factory.

Space for the new bathing room was found at one end of the lofty forge-shop in the works of the firm which are located at 9-15 Richards street, Brooklyn. A new story was "hung on" to the roof, forming a room, as shown in the accompanying plan, Fig. 1, 50 feet in length and with an average width of 19 feet. On one side of the new room are placed 12 shower baths, similar to that illustrated in Fig. 2, consisting of small cubicles with ample room for a man to stand and move in. In each is fixed a large overhead spray connected to pipes conveying hot and cold water. The hot water pipe is connected with the heating system in use all over the factory, and the cold with the street main. These can be regulated so as to obtain any temperature desired by the bather. A rack with soap is fixed on the wall; and the water is conveyed off by a trough at the

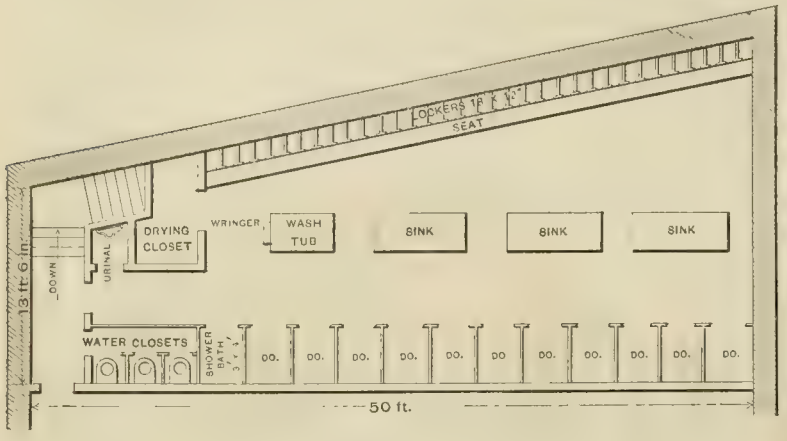


Fig. 1.—Plan View of Washhouse.

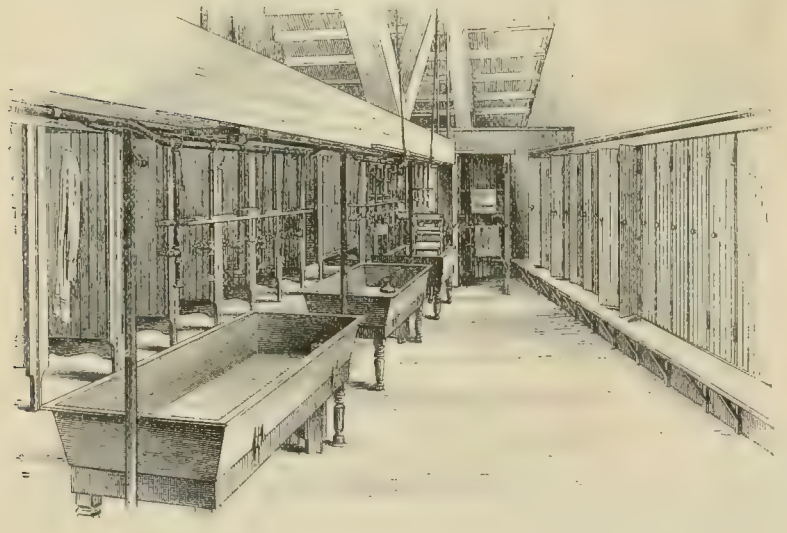


Fig. 3.—General View of Washroom.

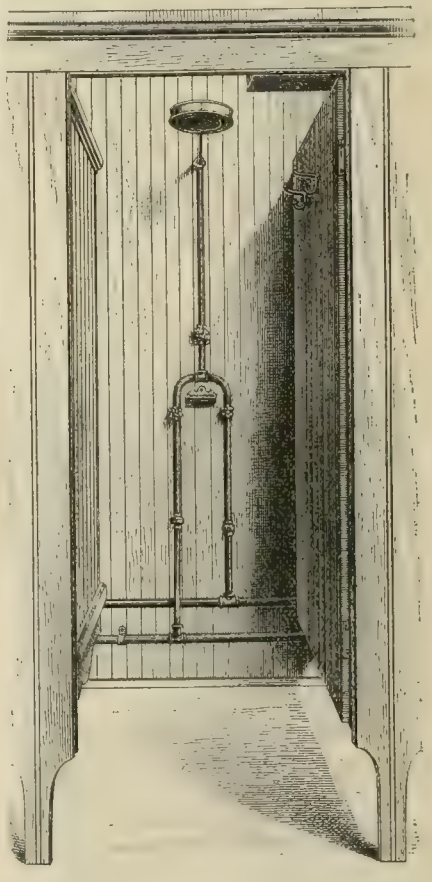


Fig. 2.—Shower Bath Compartment, Showing Piping.

BATHING AND WASHING FACILITIES IN J. H. WILLIAMS & CO.'S FACTORY, BROOKLYN.

side of the room, the asphalt floor having a double incline, which insures the ready flow of water. These bathing compartments occupy but a small floor space, being only 3 feet by 4 feet in dimensions.

It is calculated that the men will take but from three to five minutes in getting a wash-down, so that a number can bathe in rapid succession; a great feature where all wish to bathe at the same time, as would be the case in large factories. The baths would probably be most in request at the close of the day's work, when men do not care to waste their time in prolonged ablutions, and yet can afford sufficient time to get a thorough cleansing by a shower bath on this principle. The water each would use, too, would be but about one-seventh of the amount required for a tub. No attendant is necessary to fill tubs, &c., and no cleaning up is entailed afterward, as the water runs off immediately, the cleansing being automatic.

There are other advantages in the shower-bath system also, in that no soiled water touches the body, consequently the cleansing is more thorough and there is no danger, as in the bath-tub, of communicating disease. The baths are ready, too, at all seasons and times, and there is little apparatus to get out of order. It is believed that in hot weather the men will often utilize a portion of their dinner time in getting a "refresher" in the bathroom, and will go back invigorated thereby to their afternoon's work.

The system appears to be one that would recommend itself to employers solicitous for the comfort and health of their men. It is also calculated to educate the men in habits of cleanliness and order, and is altogether a step in the right direction.

In addition to the shower baths, the washroom is provided, as shown on plan and in the general view of the room, Fig. 3, with three large cast-iron troughs, in which those men can wash themselves who do not require a regular bath. These are each fitted with a row of half a dozen sprinklers, so that the men can get a *douche* for their heads. The troughs are filled with warm water just before the dinner and knocking-off hours, by an attendant, who is able to keep the whole place clean with but very little trouble.

There is also a further laudable innovation connected with this institution. A matter which has long troubled workingmen is the disposal of their working clothes. These become soaked with perspiration in a place like a forge shop, and when taken off at the day's end must be either carried home to be washed, or hung up in the shop to dry and put on next day in a sour, unpleasant state. Usually, the latter alternative is resorted to. In this washhouse a large soapstone sink is provided, where the men can in a few minutes rinse out their soiled garments and pass them through a wringer attached to the side of the trough. A drying closet is placed at the corner of the room, where, by means of hot-water pipes, the clothes are thoroughly dried; and they can thus be put on next morning clean and fresh—a great boon to men who work in the heat of a forge shop, and are constantly in a condition of sweat, which soaks the clothes in which they work.

Opposite the bathing compartments is a double line of lockers, 80 in all, in which the men can stow their clothes. These lockers are high enough for hanging garments, and are provided with hooks and a shelf for small articles. At the foot of the lockers runs a shelf on which the men can sit down. The view, Fig. 3, shows only one row of these lockers. Another is now being erected above them. The water-closet facilities attached to the bathroom are exceptionally good and would do credit to any well-appointed house, being of the latest type, with toilet paper and washing facilities provided.

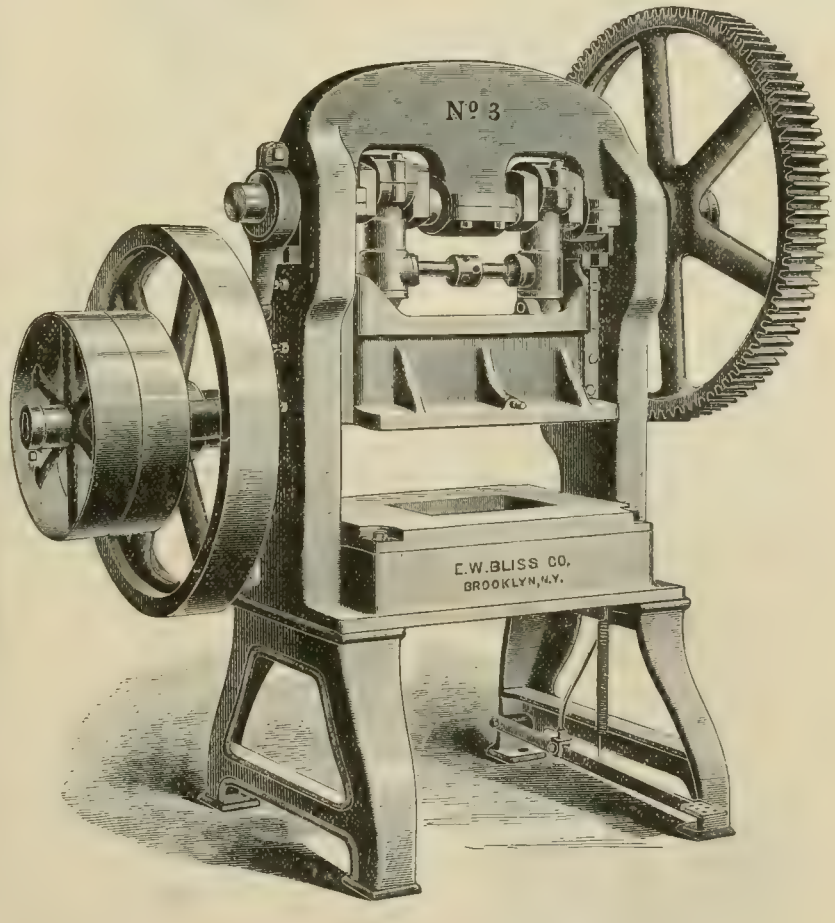
The bathroom is high and light, being provided with large skylights, over which shades are drawn in sunny weather. Thorough ventilation is secured by side lights which can be opened to their full extent, keeping the room cool at all times. Two large mirrors are fixed to the walls.

Mr. Williams looks at the matter primarily from a business point of view, believing that the bathing and washing facilities he gives his men will prove a good investment in the increased returns of work done. At the same time he regards it as a still wider question, affecting the community at large. His opinion on the subject is briefly put, in his own words, thus: "As it is acknowledged that habitual bathing prevents disease, and promotes health and morality, baths for working people affect all classes of society. Employers are, therefore, under moral obligations to supply such facilities, and health, decency and humanity demand it, because few opportunities for personal cleanliness are afforded to any but the privileged classes."

The arrangements are open to inspection at any time, and Mr. Williams has intimated his willingness to give any information desired in regard to the same, to those wishing to examine into his methods.

The Bliss Double Crank Press.

The accompanying cut shows a double crank press of new design made by the E. W. Bliss Company of Brooklyn, N. Y. The frame has been changed considerably in design and has been materially strengthened. The engraving also shows the new method of connecting the two pitmans by means of the rod shown, so as to enable the operator to quickly raise or lower the slide without danger of getting the two pitmans out of alignment with each other and with the guides. This press is specially adapted for operating large cutting, forming, perforating and bending dies. It can also be made without gearing and with overhanging frame instead of the straight uprights shown. Its most important dimensions are: 36 inches between the uprights; die space, up and down, 10 inches; adjustment, 2 inches; hight, 90 inches, and weight 5500 pounds.



THE BLISS DOUBLE CRANK PRESS.

Dr. Walter Kempster, who for six months past has been traveling abroad for the United States Government, for the study of cholera and its prevention, is completing his report. Its substance is that it is possible to keep the cholera from a city when the surrounding towns are tainted or to keep it from any house in an infected city, provided proper precautions are taken.

A new cable grip, invented by Major McNulty, chief engineer of the Broadway cable road, New York, has been tested on that road.

THE RETAIL STORE.

Boston Iron and Hardware Club.

The organization of this club, which has for some time been under way, has been perfected, and at a meeting held June 28 the constitution and by-laws were adopted and the following officers elected:

President,
S. A. BIGELOW, Bigelow & Dowse.
Vice-President,
E. A. HALEY, Dodge, Haley & Co.
Secretary,
F. H. BUTTS, Butts & Ordway.
Treasurer,
C. H. BRECK, Jos. Breck & Sons.

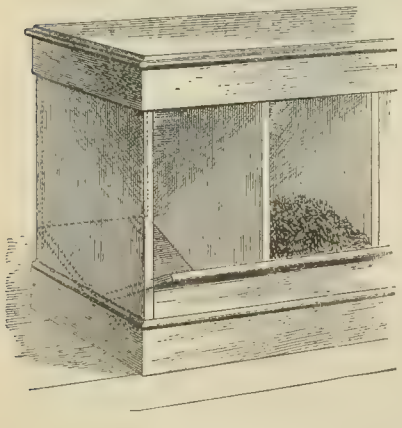
At the same meeting the following directors were also elected:

A. J. CHASE, Chase, Parker & Co.
LEON CARTER, Dana Hardware Company.
J. H. ROBBINS, Brooks, Baldwin & Robbins.
E. H. MANSFIELD, Woodrough, Mansfield & Co.

This club, while including all the Hardware houses of Boston, is not intended to be limited to merchants in that city, but is designed to cover the trade of the whole of New England. Its object is both to promote acquaintance among the membership and also to take action upon trade matters in which the merchants are mutually interested. It begins its operations under very favorable auspices, and its success is regarded as assured.

An Arrangement for Nails.

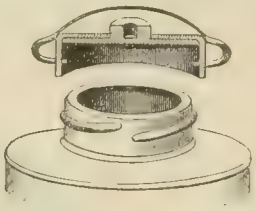
E. R. Smith, Pennville, Pa., has favored us with a sketch of Nail counter and bins, from which the accompanying cut has been made. The counter corresponds with others in the store in appearance, but has a hopper formed of boards slanting to the center near the floor. The board on the open side of the bins projects about 4 inches to admit of putting the scoop under when raking out Nails. Partitions are fitted in to form the several compartments, which are made large enough to hold from one to two kegs of Nails each.



An Arrangement for Nails.

Improved Glue-Can Top.

Russia Cement Company, Gloucester, Mass., and 95 Reade street, New York, are now packing Le Page's liquid glue and the various sizings made by them into tin cans having an improved top, as shown herewith. The improvement consists in the neck of the can being of tinned malleable iron with the cam sections cast on it, instead of tin with wire soldered on for cam sections. The wire points which project inside the cap require but a quarter turn to open or close the cover, while the cap and the eccentric shape of the cam draws the top down, making the vessel air tight. In the smaller packages, holes in the cap, surrounded by rubber, are provided for brushes, furnished with the packages, the holes so arranged that the brush can be adjusted to the quantity of glue in the can. The larger cans, for mechanics' use, have no brushes.



Improved Glue-Can Top.

The Lost Price-List.

The necessity of having a systematic arrangement of catalogues and price-lists was forcibly brought to the writer's notice during a short call at the store of a retail Hardware firm. At the time mentioned one of the partners was throwing out catalogues on the show case, while a prospective customer was waiting to know the price of some article not kept in stock. The books were taken, some from a cupboard behind the desk and some from a drawer under the counter. In a nervous, distracted and hurried manner the pile was gone over by the merchant two or three times in search of the one wanted, remarking the while that it was strange where that price-list had gone. He handed the customer a catalogue containing the same kind of goods, made by a different manufacturer than the one wanted, to keep him occupied, quietly called a clerk and sent him across the street to borrow the catalogue the merchant had been looking for, and betook himself to the back of the store, apparently to look for it there, but in reality to wait the return of the clerk. The conclusion the writer came to as he left the store was that, nine chances to one, the merchant would not take the order; while on the other hand, if the catalogues had been arranged and indexed, so that the class of goods and the various manufacturers of them could have been turned to in a moment, there would not have been much delay in closing the bargain.

Kitchen Novelties.

Matthai, Ingram & Co., Baltimore, Md., and 42 Cliff street, New York, are putting the above articles on the market as herewith shown. The Gem grater, Fig. 1, is described as being made entirely by machinery, having a retinned wrought-iron frame, and it is claimed to be strong, easily cleaned and durable. The seamless cup, Fig. 2, has a novel feature in the heavy spring handle riveted at the top and open at the bottom. The handle serves as a hook for attaching the cup to a belt, pail or other article. The galvanized soap dish, Fig 3, is provided with a drainer. The company advise us that they are turning out this article by means of improved machinery, and they claim that it meets the demand for a low priced durable soap dish.

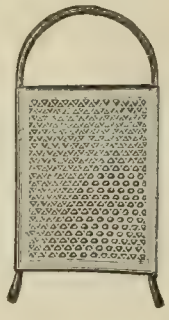


Fig. 1.—The Gem Grater.

Fig. 2.—Seamless Cup.

Fig. 3.—Galvanized Soap Dish.

The Iron Age Hardware Price Book F.*

This Price Book, which has just been received from the binders' hands, is larger, handsomer and more complete than the other *Iron Age* Price Books, A, B, C, D and F. The F Price Book is 8¼ x 11 inches in size, containing 556 pages of the celebrated Crane's heavy ledger paper, which is tough and strong, permitting frequent changes and erasures. The book is bound in the most substantial manner to withstand hard and constant usage, with covers of flexible seal grained leather. By means of the arrangement shown in Fig. 1, the index applies to every page, each page having an index tab (except 80 pages of supplement in the back of the book), thus permitting reference to any article at a single motion. This greatly facilitates the use of the book, avoiding the troublesome turning from page to page which is necessary in connection with other Price Books. Book F has been prepared with great care, giving a place, it is believed, for every article in the Hardware line, and ample space for recording prices. Sufficient space has also been provided for large lines of goods by allowing four pages to such goods, instead of two pages, as for lines of goods requiring less space. This is accomplished, as in **A X**, for example, by having the letter **A** on a short tab on the first of the two leaves, and **A X** on the tab of the second or lower leaf. The **A** on the first leaf is directly over the **A** on the lower leaf, so that the index reads **A X** whether looking at both leaves together or at the lower leaf only. The four rows of index tabs are printed in gold letters on black Russia leather, the tabs securely fastened on both sides of each page, making a handsome and durable index. Fig. 2 shows the index letters full size, and represents the eight first indices from each of the four rows of index. The book is arranged to keep a complete record of goods and prices on a single page, the width giving sufficient room, as shown in Fig. 1. The 80-page supplement at the back of the book is provided to give room for supplemental quotations, memoranda, tables, &c.

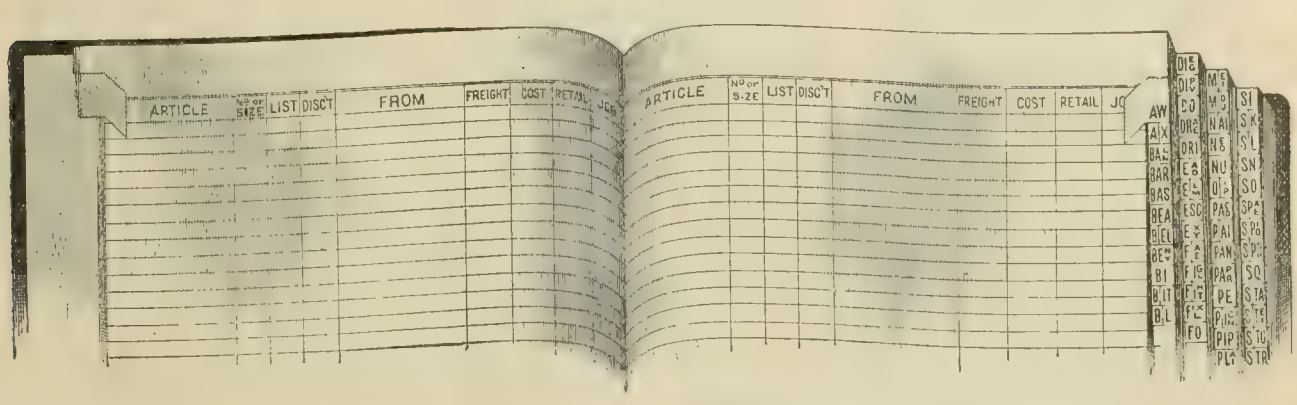


Fig. 1.—The Iron Age Hardware Price Book F.

AD	DIE C	ME I	SI
AN	DIP V	MO U	SK
AU	DO	NAI	SL
AW	DRA E	NE O	SN
AX	DRI	NU	SO
BAL N	E AD	O R	SPE A
BAR	EL M	PAC D	SPI O
BAS	ESC	PAI	SPR

Fig. 2.—Fac-simile of Indexing, Price Book F.

A special feature of the book, as also of Price Book E, is the arrangement of the index characters, which, while alphabetical, are arranged with special reference to the classification of Hardware goods, each index character giving the two or three first letters of the names of Hardware articles, as shown in Fig. 2, as for example :

For Augers	turn to	A U
" Parers, Apple	"	PAP R
" Saws	"	SAW
" Pumps or Punches	turn to	PUM N
" Bits	turn to	B I T
" Chisels or Chucks	turn to	CHI U
" Cutlery	turn to	CUT
" Cartridges	"	CAR
" Rules	"	RUB L
" Locks	"	L O
" Iron	"	IRO
" Irons	"	IR'S
" Shovels	"	SHO R
" Grindstones	"	GRI
" Stones	"	STO

The ease and convenience with which the book can be used is thus apparent. Special care has been taken to make the classification as indicated in the index correct and comprehensive, making provision for all Hardware articles and giving sufficient space for the keeping and recording of prices. It is thought that every strictly Hardware article has its first two or three letters given, thus permitting immediate reference to it by a single motion. It is, however, obvious if any articles are not directly designated by the index characters, that the index, being alphabetical in its arrangement, indicates the place where quotations on such articles should be recorded. The supplement, however, may be found useful for quotations on any outside goods which the Hardwareman may desire to keep prices on, while at the same time it may be used if necessary for an overflow of matter from the preceding pages, or to contain list prices or other matter relating to goods.

A 14-page pamphlet, containing a classification of the leading Hardware articles, is furnished with the Price Book, as an aid in suggesting the number of articles and the space required for each line of goods. The pamphlet will prove exceedingly useful, especially when first starting the Price Book. In connection with this Price Book a set of *The Iron Age* Standard Hardware Lists can be used with great advantage.

This Price Book is presented to the attention of Hardwaremen in the confidence that it will be found a most valuable aid in keeping track of the cost and selling prices of goods.

* "The Iron Age Hardware Price Book F," with multiple index, arranged by R. R. Williams, Hardware editor of *The Iron Age*. David Williams, publisher and bookseller, 96-102 Reade street, New York. Price, $7.50.

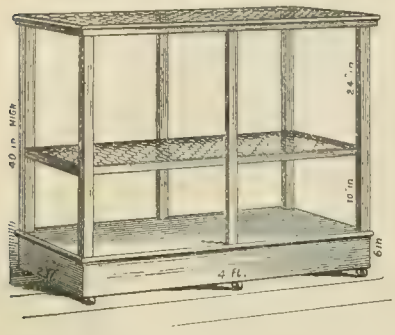
New Polishes.

The Tanite Company, Stroudsburg, Pa., and 161 Washington street, New York, have prepared a liquid polish which they state contains no injurious materials; and a polishing paste which they claim is also free from injurious ingredients, and is intended for the same uses as are met by the liquid polish. They also offer a knife polish in three different colors and qualities. This polish is in the form of dry powder, and is intended for use in rotary knife cleaning machines, on knife boards, &c. The manufacturers state that the powder is carefully graded, is even in texture and free from lumps, coarse grit, &c. Prices and size of packages are given under Notes on Prices.

GEORGE P. STOCKWELL, for many years engaged in the tin and stove business on Water street, Bridgeport, Conn., died at his residence a short time ago at the age of 80 years. He was one of the prosperous and successful business men of Bridgeport, and was one of the original trustees of the City Savings Bank of that place in 1859.

Fishing Rod Rack.

Reichley & Allison, York, Pa., have made for themselves a rack, as shown in the accompanying illustration, which they find very convenient, and which was constructed at a small outlay. The platform is

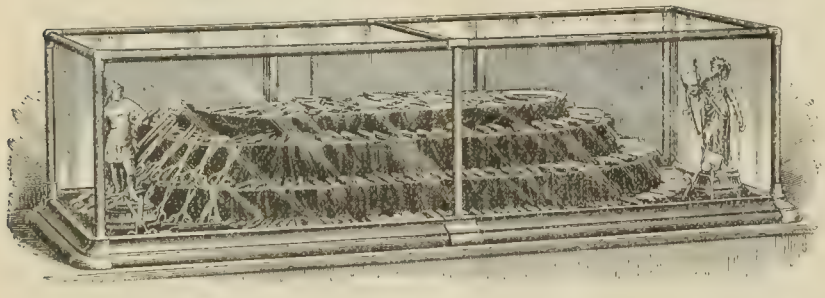


Fishing Rod Rack.

2 x 4 feet in size, 6 inches high, and is provided with six plate casters, so it may be wheeled to any part of the store or out of doors. There are six upright posts to which the frames are fastened, and on the frames are stretched pieces of 2-inch mesh poultry netting. The lower frame is 10 inches above the platform, and the upper frame 24 inches above the lower one, making the entire hight of the rack 40 inches. The number of Rods which the rack holds in comparison to its size is referred to as one of its advantages. The rack is also well adapted to holding Shovels, Hoes, Rakes, Forks, and a general variety of straight-handled goods.

Attractive Cutlery Case.

Ryan & Merrill, Miles City, Mont., have their Cutlery arranged in a case, as shown in the accompanying cut. The steps or shelves are circular in front, straight on the back, and are covered with material to show the goods to the best advantage. The shelving is left open at the back

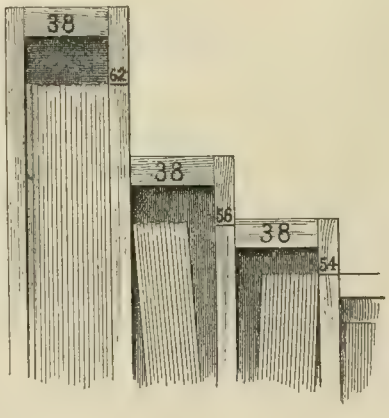


An Attractive Cutlery Case.

and provides a place for keeping stock. The center opening, which is the largest, is 19½ inches wide, 15 inches deep and 9 inches high, in which is kept the surplus stock of Pocket Knives. The original boxes are used, fixed with a staple and brass curtain ring to admit of drawing them out, the numbers being arranged in rotation. The space holds about 75 different styles of Knives. These are arranged in two rows, the rear row in five tiers deep and the outer row in seven tiers deep. The rear row is solid, while the outer row has spaces, so they may be slid one way or the other in order to get at those in the rear without disarranging the boxes in the front row. The spaces at each end of the shelving are 12 x 6 x 9 inches. At one end is kept the surplus stock of Shears, and at the other the surplus stock of Razors. The spaces will hold about six sizes of Shears and two dozen styles of Razors. The Shears are held in place on the steps by brass furniture tacks driven at the outer edge of the shelf. The statues fill in the corners of the case and add to the attractiveness of the display.

A Simple Glass Rack.

A simple and inexpensive Glass rack for holding large double or singe strength Glass can be made as shown in cut. It is made of old Glass boxes, from which the boards on one side are taken off, and are nailed together in



A Simple Glass Rack.

groups of from three to six boxes. The top and one edge of each box is painted white, the width of the Glass stenciled on the top, and the length on the side in black. A short mark is also made to show where the top of the Glass should come. C. D. Clapp, Toledo, Ohio, to whom we are indebted for the foregoing, states that with rack in use the boxes are permanent, that they do not slant or tip and that they take up but a small amount of room. He also remarks that it is the cheapest and most convenient rack he has ever used.

Novel Arrangement for Showcase.

In the establishment of Buehler, Bonbright & Co., 427 Market street, Philadelphia, Pa., showcases as shown in the accompanying illustrations, Figs. 1 and 2, are used. The feature of the arrangement is the weight which

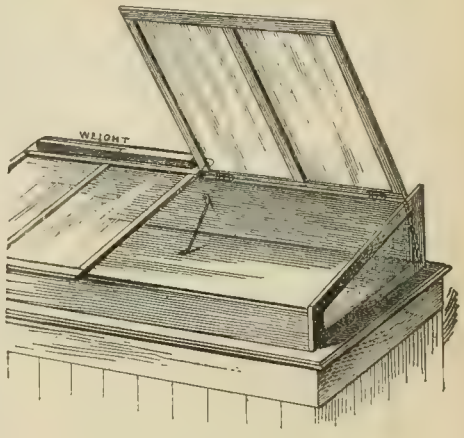


Fig. 1.—Novel Arrangement for Showcase.

counterbalances the lid of the case, holding it open when raised. The weight may be put on the top of the lid, as shown in the cuts, or hung underneath, as desired. It is desirable to have the weight distributed equally over the width of the sash to insure a distribution of the strain; the balance or weight may be neatly concealed in a box. Iron or lead is used for balances, and a base knob for a buffer. If the back of the case is designed to go close against the wall, the back can be sloped as in Fig. 2, to

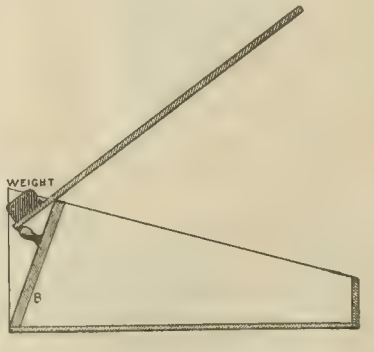


Fig. 2.—Weight and Buffer.

allow space for the balance, without sacrificing room on the bottom of the case. The weights vary with the size of the lid of the case, those in use being from 32 to 65 pounds, as the glass in the lids is heavy plate. This idea originated with Mr. Bonbright and a few of the cases were put in use. The arrangement proved so satisfactory that the system is being extended all over the store. The cases are arranged on the ledges under the shelving, also on counters, and are used for samples only. The store is 260 feet deep, facing on two streets, four stories high.

STOVE TRADE NOTES.

The Future of the Hot-Air Furnace.

BY A. W. GLESSNER,

President of the Excelsior Steel Furnace Company, Chicago, Ill.

THE SALE OF FURNACES.

If the sale of an article throughout a term of years can be considered a reliable index of its popularity, then the hot-air furnace must be a very popular article, for the demand for it has been constantly on the increase during the past five years. Each year has shown increased sales over the preceding year, and that increase in 1892 over 1891 must have been fully 25 per cent., and this in spite of the fiercest possible competition from other modes of heating. It is difficult to get at the actual number of furnaces sold in this country during 1892, but from statements made by different makers as to their outputs and from reports from our salesmen of the business done, it would seem that the aggregate number of furnaces sold in that year must have exceeded 65,000, and there are some makers who incline to place the figures considerably higher. A fairly accurate means of computation of the number of furnaces sold can be had from a knowledge of the amount of business done by the register makers, by far the larger portion of whose product is taken by the furnace dealers, and the business in registers in 1892 would indicate that upward of 600,000 were sold, and figuring that the furnace trade took two-thirds of this number and that on an average seven registers were used to a job these figures would indicate that nearly 60,000 furnace jobs were installed. These estimates are only approximate, but a tabulation of the furnaces made by the different makers would seem that the figures given are not too large.

In the East, and in many of the larger cities, the use of furnaces in smaller houses and flats has led to a decrease in the number of registers used to each job, and this has been further brought about by the installation of furnaces in old houses where first floor registers only are used.

THE DISTRIBUTION OF FURNACES.

At the recent meeting of the steam and hot-water fitters, held in this city, one of the leading makers of furnaces, and also a large producer of steam and hot-water boilers, had an exhibit of the latter forms of heating apparatus at the hotel where the fitters assembled, and the representative in charge was asked to state the effect had on the furnace branch of their business by the addition some years ago of hot-water and steam boilers to their line. His reply was that they had continued to sell more furnaces each year, and also found the sale of their steam and hot-water goods increasing, and this naturally brings us to a consideration of the distribution of hot-air furnaces. It is evident from an examination of the field that a marked change has come about within the past five years in the distribution of furnaces, and that while there is still a strong demand for high-grade furnaces to heat the residences built by the well to do in our various towns and cities, it is plain to note that a larger and larger proportion of houses costing $10,000 and over are being heated by hot water, but, as the number of houses of lesser cost are increasing in greater proportion than are those of the larger and more expensive class, the increase in the number of furnaces sold is partially accounted for. That hot water is taking a much greater proportion of the finer trade reflects not alone on hot air, but on steam as well, and the demand for hot water in the finer residences is a matter not alone of the preference for the hot-water heat over air or steam, but of the disposition to increase the cost of fine residences in our large cities by the addition of every new and expensive adjunct, and hot water has been a fad with not a few.

Again, in cities, an increasing number of blocks of houses are yearly put up by contractors for sale on easy terms, and have been equipped with furnaces; while flats without number are being erected, and tenants cannot be found unless some form of modern heating is provided, and furnace heat has been generally selected.

In the country, in towns and villages where, five years ago, a furnace was a novelty, and was to be found only in the church or public hall, the average house owner either has a furnace or is planning to have one as soon as he is able to afford it; and the new residences and buildings going up are provided with this form of heat.

It is also true that in many stores and also in office buildings of two and three stories in interior towns furnaces are being installed, and this movement has extended into the far West. Schoolhouses in Iowa and Nebraska are being supplied with furnace heat, and as far West as Utah furnaces are gradually coming into use, and the demand will grow as the knowledge of furnace heating and installation increases among the dealers.

Farmers are also alive to the benefits of a well-heated house, and have taken not a few furnaces of late; but a very important outlet for the production of furnaces is yet to be considered, and this is the introduction of the furnace into the working man's home in Philadelphia and elsewhere, which has resulted in the sale of thousands of furnaces of small size and yet of capacity equal to the damands made upon them. A model of such a home is to be seen on the Midway Plaisance at the World's Fair at Chicago; and while the cost of installing such a job is merely nominal, the results in the aggregate are such as to make a large sum.

(To be continued.)

ONE OF THE recent contracts closed by R. Campbell, 305 Pearl street, New York, was to heat with hot air a row of houses in which furnaces had failed to give satisfaction last winter. When the flues are rearranged Novelty Furnaces will be connected with them, as Mr. Campbell runs the line of Novelty goods made by the Abram Cox Stove Company, Philadelphia, and is confident that his plan of operations will prevent further complaint.

The Peoria Stove Works.

The catalogue just issued by the Culter & Proctor Stove Company, proprietors of the Peoria Stove Works, Peoria, Ill., is a comprehensive little volume, of a size which may be readily carried in the pocket, and is arranged in a manner convenient for reference. It is printed in two colors and bound in stiff board covers with gilt side title. In offering the volume to the trade the makers invite special attention, among others, to the Peoria Lexington range, made with six boiler holes and arranged for burning coal or wood. This stove has large flues, improved dampers, heavy linings, double covers, curved front grate of the shaking and dumping type, and full nickel trimmings. Under the same name the company offer a soft-coal range, embodying the modern features of construction and ornamentation. They also manufacture a soft-coal cook stove, for which many strong claims are made. Other goods include the Wabash and Woman's Rights cook stove, the Antelope range, made for burning wood only, and the Antelope four-hole cook stove. The heaters are represented by the Peoria, an all cast Todd for burning wood, and shown in a variety of styles and sizes; the Challenge, an attractive surface burner, having large radiating and ventilating flues extending from the bottom to the top and greatly increased heating surfaces; the Model Peoria, a hot blast ventilating parlor stove for soft coal; the Peoria Queen, a handsome square stove, which is being brought out to meet the demand for a substitute for stoves of the oak style; the Peoria hard-coal base-burner, with round fire pot, anti-clinker draw-center grate; the Peoria Oak, so constructed as to bring the fire pot as low down as possible; the Oak cottage, the Black Hawk, a neat cannon stove, made in several sizes; the Chief and the Empress. The catalogue closes with a list of stove repairs and the statement that the company carry in stock at all times a complete line of the best quality ground and plain hollow ware.

Ferncliff Stove Works.

We are indebted to F. L. Voegtly & Co., proprietors of the Ferncliff Stove Works of Allegheny City, Pa., for a copy of a neat catalogue and price list which they have just issued relating to their specialties. The little volume is made up of 38 pages of descriptive text and illustrations and is bound in green covers with side title wholly typographical in character. Reference is made to the new and attractive patterns which the company have introduced to the trade and to the facilities which they enjoy for manufacturing purposes. The early portion of the catalogue is devoted to the improved

Ferncliff range, a six-hole construction embodying the modern improvements and adapted for using coal or wood as a fuel. The makers state that each range is specially adapted for soft coal and can be had in a variety of styles and sizes. It is brought out this season with a new dress and has large flues, ample fire box with heavy cast linings and large top feed with register in the door. Following this construction we find the Fayette four-hole cook stove, made extra heavy in all its parts and designed for burning coal or wood and the Pansy, another member of this class and offered at a low price. Among the heaters the leading place is given to the Maybell, a very neat Franklin stove, possessing all the advantages of an open grate fire. The makers state that the manner of burning the fuel is the same as employed in the low down grates set in masonry, while economy and cleanliness are secured by means of an improved patent sliding blower. The stove is made in three sizes and is shown in the catalogue with the blower removed and also in position. The Mingo is another neat parlor stove of the Franklin type, which is made in three sizes. The Violet, a neat dwarf stove; the National cannon, made in two sizes and the Soho, a cheap globe stove, are some of the other goods to which attention is invited. A comprehensive price-list and some remarks about repairs complete the catalogue.

The Bridge & Beach Mfg. Company.

A handsome publication of 128 pages is that which reaches us from the Bridge & Beach Mfg. Company of St. Louis, Mo., Portland, Ore., and San Francisco, Cal. It contains illustrations of a fine assortment of ranges, cook stoves and heaters, among which are many new patterns for the year 1893. These include eight new lines, embracing 20 sizes of heating stoves, a new medium-priced coal range and a line of swing top box stoves, which are offered at a low price. In presenting this catalogue and price-list to the trade the manufacturers state that it contains not a single "duplicate or filed up pattern," and that all patterns are protected by letters patent, so that consumers handling their line of goods "control a specialty." The opening pages of the volume are devoted to general views of the company's works and several branches, remarks on breakages and freight overcharges on stoves and castings, suggestions with regard to the draft of chimneys in connection with which the stoves are employed and a telegraphic code for use in ordering goods by wire. Something like 20 pages are given up to ranges and cook stoves for burning wood as a fuel. These include the Grand Superior, Banner Mohawk and Home Mohawk ranges, and the Home Superior, Fern and Mohawk cooks, all of which are made in a variety of styles and sizes and embody the modern features of construction. The ornamentation in each instance is neat and effective, rendering the stove pleasing to the eye. Following these are a number of pages devoted to coal-burning constructions, made under names similar to those already given. Among the heating stoves we find the Superior Air Tight occupying the place of honor. This is in the nature of an oak stove made with single or double fire pot, large bailed ash pan, smoke fender, draw center wood grate and cone center coal grate. Under the name of Superior Oak the company offer a complete line of low-priced heaters adapted for burning coal or wood. The Elmo is a hard coal base burner made in two sizes, while the Lotus is a direct draft soft coal heater. A rather odd looking construction is the Pioneer, made with two boiler holes and a circular drum through which extends the smoke pipe in such a way as to heat the drum and render it serviceable as an oven. The Franklin is a very richly treated, all cast heater for wood, and is made in two sizes. A varied assortment of Todd, box, cottage parlor, cannon, globe and laundry stoves are also included. The catalogue concludes with a price-list of an extended nature, illustrations of water coils and couplings for use in connection with cook stoves and ranges, a long list of hollow ware, extras, &c., directions for ordering repairs, a variety of newspaper advertising cuts, and a comprehensive index. The catalogue is bound in a very neat style, the corners of the pages being rounded and the edges finished in a yellowish tint. The side title bears the dates 1837 and 1893, together with the name and various addresses of the company in black script letters on a straw colored ground.

A Fine Sample Room.

The Michigan Stove Company have entirely rearranged and redecorated the great sample room in their Chicago branch house on Clinton street, between Van Buren and Harrison streets. They have completely changed the immense line of cook stoves and ranges, putting samples of this year's new goods in all their places. Not an old cook stove or range is to be seen on the floor. The work of preparing for this complete overhauling of patterns has taken some three years. The style of castings and trimming adopted is very rich, surpassing in beauty anything previously accomplished by this radically progressive company. Scroll work predominates in the ornamention, but the scrolls are large, requiring fine molding to bring out their surfaces smoothly. The immense variety of the company's productions in this line is shown by the fact that 125 samples are displayed, and even this does not comprise the entire assortment, as there was not room enough to sample everything. The cook stoves and ranges occupy the main portion of the sample room, arranged in four long rows. Heaters extend along the side, ranged in the order of their sizes, and overflow in a side extension of the room in the rear.

A recess in the center, projecting into the warehouse, contains more ranges and a line of steel ranges surmounted by an elegant canopy extending the full length of three ranges in an unbroken stretch. The salesmen's desks have been removed to the rear of the sample room, where a row of windows gives them an abundance of light. A heavy brass railing separates this space from the rest of the room. The change from their former dark quarters in the recess is keenly appreciated by the genial travelers.

An original Detroit cook stove, made by Jeremiah Dwyer & Co. in 1862, before the incorporation of any of the Detroit stove companies, occupies a conspicuous position among the samples. It is a fine-looking stove, and was in its day a very popular stove in Western kitchens. Beside it stands a specimen of the first anthracite self-feeding stove in America, invented by Dr. Nott, president of Union College, Schenectady, N. Y., from 1804 to 1866. This identical stove was placed in the experimenting room of the college early in the present century, and is still in a good state of preservation.

The walls of the sample room are colored a dreamy tint, suggestive of pea green, which harmonizes with the black and nickel of the stoves very well. It was the suggestion of F. D. Millet, the artist in charge of the World's Fair color department.

ODD PLATES.

The Auburn Stove Foundry Company of Auburn, Maine, have just brought out an attractive wood parlor stove known as the Falmouth. It is made in two sizes, is of graceful proportions and ornamental in design. The coal parlor stove which the company placed upon the market last year and the Royal Falmouth and Stanley ranges met with a large sale and are constantly growing in popularity. The company are keeping a sharp eye on the market and continually striving, by means of new patterns and improvements, to cater to the public demand. That they have been successful in accomplishing this end is evidenced from the continually increasing sales recorded for their goods. The company state that the outlook for the coming season is very bright, and that although business this year in general promises to be very quiet, they expect to enjoy a larger volume of trade than ever before. Another indication of the company's prosperity is found in the fact that a semi-annual dividend of 3 per cent. was declared a short time ago, payable on the 1st of July.

J. J. Wolf of Cleveland, Ohio, is representing the Victor Stove Company of Salem, Ohio, in Indiana, Illinois and Michigan, and showing a new open Franklin and some new cooks and ranges. The company have not been represented by Louis Waldecker of St. Louis, Mo., since the middle of March, when their business connection was severed.

"The Alaska Stove Hardware" is the title of an eight-page circular which has just been distributed to the trade by the Troy Nickel Works, Troy, N. Y. The design on the front cover is exceedingly frigid in character, and has imbedded in its center a representation of a boltless stove knob and the words "Always cold." The pages of the circular show illustrations of Alaska fire sets, parlor sets, pokers, lifters, shovels, loop handles, &c., finished in nickel plate and of a design in keeping with the high class of goods turned out by the concern named.

The Cabinet gasoline ranges made by the Dangler Stove & Mfg. Company, Cleveland, Ohio, have received an appreciative welcome at the hands of the public, while the Surprise, New Success and Dangler Process stoves have all had a liberal patronage. The low Juniors are consumed in never-diminishing quantities every season, and the advent of the high Junior only swells the number.

The Crown furnace and Crown steam-heater are constructions to which the manufacturers, March-Brownback Stove Company, Pottstown, Pa., refer to with no little pride. They state that the Crown furnace is made of the best quality cast iron and wrought steel and is gas and

dust tight. The Crown steam-heater is strongly built and is economical in the use of fuel. The company have issued a special heater catalogue, a copy of which will be sent to any one who may be sufficiently interested to write for it.

A. Weiskittel & Son, Baltimore, Md., have issued a neat folder relating to some of the fire place heaters which they manufacture. The list includes the Favorite, Ideal, Comfort and the Fire King. The principal features of these heaters are pointed out, while several testimonial letters show their popularity in the trade.

The Joliet Stove Works of Joliet, Ill., are pushing with a great deal of enterprise the sale of Moore's air-tight heater, the features embodied in which are fully covered by letters patent. The makers state that it is practically a small furnace surrounded by an open casing. The fire pot, dome and air flues are arranged in much the same manner as in the most approved furnace construction. Since this heater has been introduced to the trade a large number have been sold and it is steadily growing in popularity.

The Bussey-McLeod Foundry, Troy, which shut down for repairs, started again Thursday, July 13, after about a week's idleness. They report business about the same as at this time last year.

The Burrell-Johnson Iron Company, Limited, Yarmouth, N. S., have issued a large circular showing the Model Grand six-hole range, fitted with reservoir, elevated hot closets and low warming closets. This range is referred to as being well made in all its parts, embodies the modern features and is ornamented in an attractive style. The range is well known to the trade of the United States as a product of the foundry of the Spicer Stove Company of Providence, R. I., although the concern named above are sole manufacturers for the Dominion of Canada. Surrounding the picture of the stove on the circular referred to are a number of testimonial letters from some of those who have used the Model Grand and who testify in flattering terms to the satisfaction which it has given.

A recent issue of the Baltimore *Sun* says that the plant of the Union Foundry & Stove Works of Frederick, Md., was recently sold by the trustees to F. M. Fauble.

The New Jersey Lamp & Bronze Works of New Brunswick, N. J., of which Ralph W. Booth, of the place named, is manager, and Henry Gleason, of 106 Beekman street, is New York agent, send us a copy of an interesting catalogue which they have issued showing the line of stove figures and urns manufactured by them. The printing is in various colors, in imitation of the style in which the different classes of goods are made. The figures cover a wide range, each being numbered, thus facilitating ordering and reducing liability to error to a minimum.

The Weir Stove Company of Weir Village, near Taunton, Mass., closed their works on the morning of July 1 and remained shut down until Wednesday, the 19th inst. During the interval a number of necessary repairs were made and such changes incorporated as the business of the company warranted.

M. M. Ewing is now on the road representing the Howard Stove Company, Beaver Falls, Pa., and showing the trade a new pouch-feed flat top cook stove, made in two sizes, 8 and 9 inch. The Howard range has been redressed for this year, the new oven door having a nickel-plated panel with a tile and new set of feet with a skirt. It also has a top cresting, which contributes a pretty effect as well as being useful.

Burdett, Smith & Co.'s foundry at Troy, N. Y., which suspended operations Thursday, June 29, for the purpose of allowing their employees a vacation and for making necessary annual repairs, resumed operations Friday, July 14.

James Boyle of James Boyle & Co., Salem, Ohio, when in Chicago at the meeting of the National Association, found the fair more interesting than the stove convention and spent most of the week enjoying the sights and storing up ideas for the production of additions to the line of stoves of which the Perfect Oak is now a leader.

The Excelsior Steel Furnace Company of 110–114 South Jefferson street, Chicago, Ill., have issued a couple of leaflets, one of which is entitled "First Cost and Final Cost," while the other is headed "What You Get When You Buy an Excelsior Steel Furnace." The construction named is described in such a way as to emphasize the special features embodied, while the advantages of the furnace are carefully pointed out. The company state that it is easy to figure the first cost of a furnace, but not so easy to figure the final cost. In making their heaters they have endeavored to render as easy as possible the work of the furnace setter, and they state that in the fitting and construction of their goods they believe they save the dealer several dollars over the cost of setting furnaces of other makers. One of the special advantages to dealers handling the Excelsior steel furnaces is claimed to be the fact that they can obtain of one house everything needed in the way of furnace fittings.

A visit to the Standard Lighting Company of Cleveland, Ohio, is sure to receive a cordial welcome and the accumulation of much interesting history of the growth of the use of gasoline stoves all through the country, and how the New Process vapor stoves increase in popularity as they become more widely introduced.

Grange Sard, vice-president of Rathbone, Sard & Co., Albany, N. Y., has returned from a vacation at Magnolia, Mass., and Colonel Bowditch of the same concern from Northeast Harbor, Maine.

John T. Perry of the Perry Stove Company says that from the present indications work will continue without interruption until later in the fall than usual, a large number of men being employed. It is the opinion generally among the stove men in that section that the manufacturers of heating goods will tide over the financial stringency safely, and that the outlook will be brighter in a short time. A boom is liable to succeed the present depression.

The Committee of Awards on Floats in the Fourth of July celebration at Troy, N. Y., awarded William E. Sandham, the Troy agent of Rathbone, Sard & Co., Albany, N. Y., the prize for the most meritorious stove display of the day. Mr. Sandham feels much elated over this result. A diploma was awarded to George H. Cole of Troy for his gasoline stove exhibit, and one to the Andes Stove Company for the most artistic float representing the stove industry. The Sandham display of Acorn stoves was a beautiful one, containing three ranges and two parlor stoves, all handsomely nickeled, making a dazzling array.

J. Woodruff & Sons, Salem, Ohio, have some new attractions to their line of stoves and ranges that will catch the people's fancy when displayed by the dealers in the fall.

The Leibrandt & McDowell Stove Co., Philadelphia, are not adding to their line of goods this season, and beyond one or two immaterial changes the line will be the same as last year. Their supplementary catalogue for the season covers their Victor Cook, Target, Prompt, Tayloe, Cozy, Midway, Ironsides, New Ironsides, Our Friend, Farmer Girl and Farmer Boy cooking stoves and ranges, their hotel range, broiler, and a line of heating stoves including the Olinda, Envoy, Radnor, New Hot Air Elm, New Vulcan, Tyrone, Luna, Opal Ray and others well known to the trade. The season will find them with a good stock on hand and present indications point to a good business.

E. A. Cress, lately with the Raymond & Campbell Mfg. Company of Middletown, Pa., is now representing the Leibrandt & McDowell Stove Company, and is calling on the trade in the interests of his new company.

The Union Furnace Company, at 30 Myrtle avenue, Cleveland, Ohio, are located in the residence section of the city and make a specialty of the furnaces turned out by the Kernan Furnace Company of Utica, N. Y. They have sold, in and around the city, between 700 and 800 of these furnaces and claim that last winter brought them no complaints from their work, but many inquiries for goods for next fall.

A. F. Wolf, who at one time was a stove manufacturer, recently made a visit to the scene of his early labors, now run by the Howard Stove Company, at Beaver Falls, Pa. Mr. Wolf is engaged in raising blooded horses at New Castle, Ky.

A good season has been experienced by the Schneider & Trenkamp Company of Cleveland, Ohio, on the line of reliable gasoline goods and all of the attending necessary equipments. Larger stoves and the best grade have been most popular this year, and their use extends longer into the cold months each year, owing to their convenience and excellent service.

Some new goods are all ready for shipment by the Paisley Stove Company, Beaver Falls, Pa. The Famous range has six holes and is made right or left hand, with pouch feed, cast linings and skirt and a nickle-plated oven panel with tile decoration. This range is made in three sizes, 7, 8 and 9 inches, all sizes having a handsome top shelf. The Home Rule is another range, in two sizes, 8-20 and 9-20, with high shelf, high closet and enameled reservoir, and of design and finish worthy of a high-grade range.

The Michigan Stove Company have issued from their Chicago office a large card intened to be hung up in the store of the hardware dealer handling the company's goods. The card carries in conspicuous form a *fac-simile* of the guarantee which is given with every Garland stove or range sold by the makers. This guarantee is manifestly of

such interest to the trade at large that we quote the text of it below:

KNOW ALL MEN BY THESE PRESENTS:

That this Garland is sold with the absolute guarantee of being the finest and best construction of its kind made for the price asked. It is guaranteed to operate in all cases under necessary conditions when the directions for using are followed.

In case of any imperfections in material or workmanship, the seller and manufacturer agree to make the same good.

Every feature of economy, durability or convenience that an experience of 20 years has shown to be desirable, will be found in the Garland line.

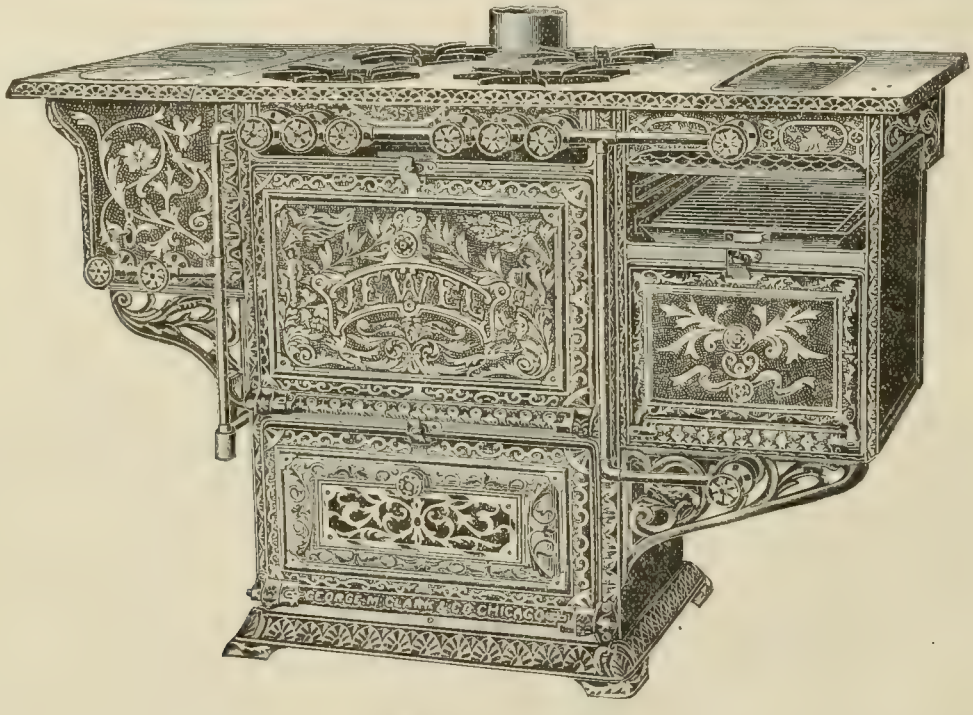
Garlands are the only line of stoves and ranges in the world made from a mixture of the best and highest grades of iron and aluminum, which mixture adds strength, prevents cracking, blow holes and other imperfections, and is a benefit to iron in every way.

The guarantee is signed by the agent or agents, handling Garland goods, and in addition the guarantee carries the trade-mark seal and signatures of the officers of the Michigan Stove Company.

JAS. L. HAIGHT, the present superintendent of manufacture of the MacKellar Foundry Facing & Supply Company, Quincy, Ill., has been in the facing business for many years, and is consequently well fitted for the position to which he has just been appointed. His long experience will go far toward making the MacKellar facings even more popular than they have been in the past. Mr. Haight succeeds W. H. MacKellar, whose resignation as superintendent was accepted at the directors' meeting held on May 1.

The Lehigh Stove & Mfg. Company,

with office and foundry at Lehighton, Carbon County, Pa., have just issued from the press a very neat catalogue, illustrating their leading lines of cook stoves and heaters. In presenting it to the trade, attention is invited to the additions and alterations which have been made in the Lehigh line of goods since the last catalogue was brought out. The Lehigh range is a very attractive, well proportioned stove, having six boiler holes, large oven, triplex grate, outside oven shelf, large flues, patent oven-door opener, and other features of convenience. It is made in several sizes and styles, and is intended for using hard coal, soft coal or wood as a fuel. The Lehigh Valley is another member of this class and is made in four sizes, several of which are shown in the catalogue. A well constructed five-hole range is offered the trade under the name Lehigh, while under the name Gem Lehigh is another range of the same general variety. The cook stoves are represented by the New Gold Medal, for coal or wood, and the Miners' Pride, a stove intended for the coal regions, where, fuel being cheap, a large fire box is essential. The heaters are represented with the Lehigh square base burner occupying the place of honor. Its constructive features include large fire back and anti-clinker grate, with center dump, capacious ash pan and desirous features of ventilation. The stove is of graceful outline and is ornamented in a way to please the eye. The Upper Lehigh, made in three sizes; the Fairy Lehigh, a cheap direct draft parlor stove, also made in three sizes; the Royal Lehigh, a square stove with perforated cast iron body and round inside steel body lined with brick; the Lehigh Franklin, the Maple, an all-cast surface burner; the Clearfield, a first-class cannon stove, and the Trix, a low-priced heater, are also considered. The catalogue closes with brief reference to the Lehigh Paste Polish, a list of stoves for which repairs can be furnished and a price-list of trimmings.



New Jewel Gas Range.

A New Jewel Gas Range.

A new series of gas ranges has just been brought out by George M. Clark & Co. of Chicago. There are four ranges in the series, and they are intended to cover the requirements of a family of any size. The largest of these ranges is herewith illustrated. This construction has eight cooking holes. Looking at the range from the front, the water heater is on the left. It has a large pipe coil with a double burner below. The heat passing about the coil is further utilized by two cooking holes at the top. The center of the range has two compartments, the upper one being a baking oven 18 x 16 by 11½ inches, and the lower one a roasting or broiling oven 18 x 17 by 9½ inches. On the right is a peculiar arrangement, which is decidedly novel and would seem to be very desirable. There is a baking plate for cakes on the top, the opening being 19½ x 9 inches, which can also be covered by a grate, making the equivalent of two cooking holes. The burner below it is a reversible burner with three caps, which is used with the caps up for baking cakes or cooking. A crank on the end of the burner reverses it, and with the caps under it is used for heating a small broiling oven below which is 12½ x 17 x 4 inches in size and is just suitable for broiling steaks or other meats for breakfast. Below this broiling chamber is a warming oven 12 x 17 x 8 inches in size, heated with a long slotted burner, which burns but a small quantity of gas and keeps food warm much more satisfactorily than the large baking oven. The burners for the water heater and the large oven are fitted with pilot lights. The two rear top burners are fitted with the Jewel Argand, one front burner with the Jewel Argand and a larger one outside of it, and another front burner with the Jewel Argand and a simmering burner in the center.

The doors are all of the drop pattern and balanced by spring hinges.

The other ranges of this series differ in some details from the one described, but are finished in precisely the same way. One has the small broiling chamber and warming oven, but no water heater. The second has a water heater, but omits the small broiling chamber and warming oven. The fourth is the plain center of the range without both the water heater and the small broiling chamber, &c.

Externally, these ranges are superb specimens of fine molding. The doors and other panels in front are finished in leaf work, exquisitely carved, with the high surfaces buffed, making a very pretty contrast to the plain black of the background. Nickel has not been used too freely in decorating. The sides are finished as well as the front, so that the range does not suffer by inspection from any but a front point of view.

TRADE REPORT.

The Iron Market.

The financial difficulties still dominate the situation and nine out of ten large concerns are expending more energy and thought over their collections than they are over new business. The need of money is bringing into the markets a good many bargains and an unusually heavy proportion of the total purchases are covered in that way.

The Iron scale is still unsettled, but it is the general belief that an agreement will be reached by the time repairs have been completed and the mills are ready for operation. The mills, however, are nearly all assuming an aggressive attitude, and as there is nothing to indicate a better demand, it is difficult to see how they all can keep their doors open. Lower prices than those now ruling will not increase the volume of business, yet that feature appears to be more susceptible of development than any other.

Pig Iron.—The New York market is exceedingly dull and there are numerous reports of concessions to effect sales. The very great reduction in the output may have some influence upon the market soon, particularly since it is known that a further restriction has gone on since the beginning of the month. We quote Northern brands at $14.50 @ $15 for No. 1; $13.75 @ $14.50 for No. 2 at tidewater. Southern Iron, same delivery, $13.75 @ $14.50 for No. 1; $12.50 @ $13.50 for No. 2; $12 @ $12.25 for No. 3; $12.25 @ $12.50 for No. 2 Soft, and $12.75 @ $13.25 for No. 1 Soft.

Transactions in the Philadelphia market have been few and unimportant during the past two or three weeks, and at the moment there is nothing in sight likely to bring about any particular increase in the volume of business. The continuous curtailment of production, however, enables holders to keep the market pretty well in hand, so that prices are steady and liable to develop firmness as soon as there is anything like an ordinarily good demand. General quotations are about as follows for Philadelphia deliveries, and from 20¢ to 30¢ less for Southern Irons at points accessible by water:

American Scotch, No. 1X...	$16.00	@ $16.50
American Scotch, No. 2X...	15.00	@ 15.50

At Chicago a few more large concerns have placed season contracts for local Coke Iron, but the general condition of trade is very bad. Consumers are not only requesting shipments deferred, but are asking for extensions of time on what they have bought. Inquiries for Southern Coke are confined to small lots of 100 tons and less, but rather more of these have been received the past week than for some time previous. Country trade seems inclined to purchase, now that prices are so low. A point has been reached, however, which is testing the endurance of makers, and they are beginning to withdraw extremely low quotations. Our quotations give the ring of regular asking prices, Chicago delivery, but they are subjected to concession, as usual of late, for immediate delivery.

Lake Superior Charcoal.....	$16.00 @	$16.25
Local Coke Foundry, No. 1...	13.50 @	14.00
Local Coke Foundry, No. 2...	12.65 @	13.00
Local Coke Foundry, No. 3...	12.75 @	13.00
Local Scotch.....	14.00 @	15.00

There cannot be said to be any improvement in Southern Pig Iron. On the contrary, some sales have been made for spot cash and prompt shipment at concessions of about 25¢ from quotations, which we do not change, for these cash sales are few and exceptional. The volume of business in the aggregate is not large and the demand is mainly for single car lots, although there have been several sales reaching 500 tons. Nearly all varieties of Iron have sold to some extent, but the chief demand is for No. 2 Foundry. Requests to postpone deliveries on maturity contracts continue to be the rule. Quotations are as follows:

Foundry.

Southern Coke, No. 1.	$13.00 @	$13. 5
Southern Coke, No. 2.....	11.50 @	11.75
Southern Coke, No. 3.....	11.00 @	11.25
Ohio Soft Stone Coal, No. 1....	16.00 @	16.25
Ohio Soft Stone Coal, No. 2....	15.00 @	15.25
Lake Superior Coke No. 1.....	15.00 @	15.25
Lake Superior Coke No. 2.....	14.00 @	14.25
Hanging Rock Charcoal, No. 1..	18.50 @	19.00
Hanging Rock Charcoal, No. 2..	17.50 @	18.00
Tennessee and Alabama Charcoal, No. 1.....	15.00 @	15.50
Tennessee and Alabama Charcoal, No. 2.....	14.00 @	14.50

Metal Market.

Copper.—No change in the general situation has taken place during the past week. Purchases by home consumers seem rather below the average, and export movement, drawing the line at deliveries on old contracts and consignments to Europe in expectation of a better market there than on this side of the Atlantic, has been comparatively light. On sales in the regular way the trading basis has been 10¼¢ for Lake Superior Ingot, 10¼¢ for Electrolytic, and 9⅞¢ @ 10¢ for Common Casting Stock. Small parcels of some few brands realized a fraction more, but only in strictly exceptional instances.

Pig Tin.—The market has been a peculiar one in certain respects, reflecting rather severe depression from the weight of excessively burdensome holdings in some quarters; "bear" manipulation that served to aggravate matters for a time and subsequently a sharp upward turn in prices so engineered as to create the impression that the leading holders have not only secured very good control but are in a position to maintain the advantage as long as the duty of 4¢ ℔ lb keeps Tin from coming to this country in any considerable quantity. Wednesday's prices on 'change were 18.90¢ bid, 19.10¢ asked for spot; 19.12¢ asked for July and 19.60¢ for August delivery.

Pig Lead.—Prices have advanced somewhat and the market shows decided recovery in tone from the depression that prevailed during the early part of the period covered by last week's review. Selling prices at the close were 3.60¢ @ 3.65¢ for spot stock and early shipments, and 3.70¢ for late shipments.

Spelter.— In the market for this metal there has been no change whatever. Sales still run light and the demand drags in a wearisome manner, while the offering indicates that more or less accumulation of stock in smelters' hands has taken place this month. Ordinarily Western brands, however, are not offered openly at less than 4.20¢, landed here, but the appearances are that offers of 4.15¢ for near future shipments would be accepted.

Antimony. — Jobbing distribution has been fair, but the movement otherwise continues light and the demand is slow. Prices are easy at 9⅞¢ for Hallett's, 10½¢ @ 10¼¢ for L X, and 10½¢ for Cookson's on the spot.

Tin Plate.—At intervals there has been rather better buying of ordinary Bessemer Coke Plates, chiefly by canners of vegetables and the trade demand for other varieties has shown slight improvement. However, the change has not been broad or general enough to have any pronounced effect upon the market, and close buyers who are in a position to pay prompt cash doubtless secure quite as good bargains as have been picked up at any time during the past month or six weeks. Future shipments continue in neglect, with hardly any interest displayed, except in special sizes, and nothing outside of common-place buying there.

Press dispatches, which will be received with considerable skepticism, announce that the Iron Mountain vein, at Iron Mountain, Mo., is virtually exhausted.

Chicago Report.

Scrap.—The following buying prices are still quoted by dealers, but many of them are refusing to purchase any stock whatever, as it is impossible for them to dispose of it to consumers.

	Per net ton.	Per lb
No. 1 Wrought Scrap	$10.00	....
Machinery Cast	7.50	....
Malleable Cast	7.00	....
Stove Plate (free of burnt)	5.00	....
Burnt Iron and Grate Bars	4.00	....
Sheet Iron and Hoops	3.00	....
Plow Steel and Breaking Stock	6.00	....
No. 2, such as Shovels, Hoes, &c	4.50	....
Old Boilers—whole (Iron)	6.00	....
" (Iron)—cut in single Sheets and Rings	9.00	....
Old Gas-Pipe and Boiler Tubes	6.00	....
Cast Borings	3.50	....
Turnings	5.00	....
Horseshoes	10 00	....
Copper Bottoms	....	7 ¢
Copper Clips and Heavy	....	8½¢
Heavy Brass	....	7½¢
Light Brass	....	4 ¢
Pipe Lead	....	3 ¢
Tea Lead	....	2½¢
Zinc	....	2¾¢
Rubber	....	2¾¢

Anthracite.—Trade is stagnant, as consumers are resenting the recent advance and are not laying in their winter's supply as usual at this time of the year. Dealers quote carload lots of 12 net tons as follows:

	Grate.	Egg, Sto. and Ch.
Chicago, Ill	$5.85	$6.10
Milwaukee, Wis	5.85	6.10
Kansas City, Mo	9.05	9.30
Council Bluffs, Iowa	9.05	9.30
Lincoln, Neb	9.20	9.45
Sioux City, Iowa	9.05	9.30
Aberdeen, S. Dak	9.10	9.35
Dubuque, Iowa	7.15	7.40
Madison, Wis	7.35	7.60
St. Paul, Minn	8.35	8.60
Burlington, Iowa	7.35	7.60
Des Moines, Iowa	8.80	9.05
Davenport, Iowa	7.15	7.40
St. Joseph, Mo	9.05	9.30
Leavenworth, Kan	9.05	9.30
Omaha, Neb	9.05	9.30

Colorado Anthracite.

COLORADO FUEL & IRON COMPANY.	
Denver	$8.00
Pueblo	8.00
Colorado Springs	8.00
Leadville	8.00
Cheyenne, Wyo	10.00
All points between Denver and Missouri River	9.35

THE SHEPARD HARDWARE COMPANY, with temporary offices at 67 and 69 Forest avenue, Buffalo, N. Y., issue a circular to the trade respecting the interference with their business caused by the destruction of their works by fire. The circular is headed with a half-tone engraving of the ruins of their factory, and below is the line "The above cut explains why we cannot execute orders promptly." They say in their circular that they are declining orders owing to the destruction of their works and office, their stock not only being burned but also the machinery, patterns, follow boards, &c. Still they hope to make shipments before November or December next. Their pattern makers are now at work, so that their customers can rely on getting Lightning Ice Cream Freezers and other goods of their manufacture for the spring season of 1894. They add that they have no repairs for Freezers on hand, but they hope within the course of a few months to be able to furnish them. The Shepard Hardware Company have not yet decided when and where they will rebuild, but will advise the trade as soon as possible.

CONDITION OF THE

Hardware Trade.

JULY is generally regarded as, perhaps, the dullest month in the year, when trade is characterized by a midsummer quietness. The present month promises to be no exception. Manufacturers are, many of them, shut down for repairs or improvements and some of them to avoid undue accumulation of stocks. Many others whose works are in operation are curtailing their production and refraining from running to their full capacity. A disposition prevails to avoid piling up stock, and it appears probable that during the present month the amount of goods manufactured will be considerably below the average. Manufacturers are induced to adopt this course on account of the present moderate demand and the uncertainty as to when trade may be expected to assume its regular volume, and also on account of the present financial stringency, which induces conservative action on their part. At the same time, it should be borne in mind that there is a considerable amount of business doing, and in some lines manufacturers have not much more than caught up with their orders. It appears evident, looking over the trade of the past six months, that its volume in many lines compares well with that of the same period in other years, and some manufacturers report it as having been exceptionally good, notwithstanding the financial disturbance. With the turn of the half-year but few changes in prices are announced, and while the market is not strong and some manufacturers would be willing to accept orders at slight concessions from former prices, quotations are on the whole well sustained.

Advices from Chicago.—The financial situation has improved somewhat, making collections better, but trade otherwise is discouragingly dull. The statement may be an exaggeration of the condition of business, but some houses report their daily orders for the past week or two hardly balancing their daily expenses. They look forward to a heavy volume of business later to compensate for the dullness now, but think it may be necessary to wait until crop prospects are more settled. World's Fair visitors are becoming more numerous in the Hardware trade, but they are buying very little, evidently coming here for recreation alone. Prices show no material change, but there appears to be a disposition to make concessions on Tin Plate, and prices are a little easy on Coke brands.

Notes on Prices.

Cut Nails.—The Cut Nail market is inactive and many of the mills are shut down. Several of them are, however, in operation. Prices are without change on a basis of $1.05 for carload lots at mill, which, however, would doubtless be slightly shaded in some cases under pressure. Small lots of either Iron or Steel Nails from store in New York are quoted regularly at about $1.30.

Advices from Chicago.—Cut Steel Nails are rather quiet in this particular locality, but good orders are being received from distant points, showing that trade is better there than here. Notwithstanding this, efforts are being made by outside manufacturers to force local trade, and reports are current of concessions being offered. The claim is made that such concessions are based on averages, the intention being to dispose of accumulations of small Nails. Regular quotations here for factory lots are continued at $1.20 to $1.25. Jobbers are quoting small lots from stock at $1.30 in a regular way and $1.25 for quantities.

Wire Nails.—Business in Wire Nails is very light. Mills are generally shut down in accordance with the understanding reached a month ago. Their disposition is to pursue a conservative course and avoid the accumulation of stock in the hope that the diminished production and possible scarcity, if business should improve, would enable them to obtain better prices. The quotation continues $1.35 for carload lots at mill. Small lots from store in New York are held at about the usual advance.

Advices from Chicago.—Although the shutdown of the factories has lasted but little more than a week, manufacturers' stocks have already been broken, and some of them are buying from the others in order to fill contracts standing on their books. Inquiries are also being received from large buyers for good quantities. Sales have therefore improved to some extent since our last report, and the future seems more hopeful. Factory lots are quoted at $1.45, Chicago, and this is now claimed to be the lowest price offered by standard mills. Local jobbers find their business affected by the pronounced dullness in building circles, but have made no change in their prices, which are $1.60 regular and $1.55 for quantities.

Barb Wire.—The Barb-Wire market is decidedly sluggish, and very little is doing. Prices are unchanged at $2.45 to $2.50 for carload lots at mill.

Advices from Chicago.—The movement from factories is very light and new orders have almost ceased. The mills, however, will remain shut down for some time, so that the dullness of trade can easily be borne for the present. Quotations continue at $2.15 for carload lots of Painted and $2.55 for Galvanized. Jobbers report their trade extremely quiet, with prices unchanged at $2.30 and $2.70, respectively.

Cordage.—The Cordage market gives indications of a slight weakness and prices are a shade lower than at our last report. The market is represented by the following quotation for round

lots, f.o.b. factory or New York, subject to a cash discount of 1½ per cent.:

	Basis.
Manila	$0.08¼ @ $0.08½
Sisal	.07 @ .07⅛
New Zealand	.06⅛ @ .06¾

Binder Twine is moving freely and without important change in price.

The Smokeless Frying Pan.—W. E. Beveridge, 305 South Sharp street, Baltimore, is manufacturing this article. It is sold from the following list, which is subject to a discount of 33⅓ per cent. in dozen lots.

No. 8	$1.00
No. 9	1.15
No. 10	1.25

Clothes Wringers.—We give below the new list of the Lovell Mfg. Company, Erie, Pa., for whom William H. Quinn & Co., 103 Chambers street, New York, are agents. This list, which is contained in their catalogue, covers their complete line of Clothes Wringers, to which numerous additions have recently been made, including a number of goods of similar pattern to those of other manufacturers with which the trade are familiar. A very complete line is thus being manufactured by the company, who make the point that they are now putting on the market a variety which covers all the requirements of the trade, so that merchants can obtain their full supply of them. Their list is as follows and is subject to a discount of 12½ per cent., terms f.o.b. Erie, 60 days, or 2 per cent. discount for cash in 10 days:

Happy Thought Wringer.

Patent Roller Bearings. Regular Width Swing Clamps.

No. 110, 10 x 1¾	rolls, per doz		$32.00
No. 112, 11 x 1¾	"	"	38.00
No. 114, 12 x 1¾	"	"	44.00

Regular Width Reversible Clamps.

No. 118, 11 x 1⅞	rolls, per doz		$44.00
No. 120, 12 x 1⅞	"	"	52.00

3-inch Reversible Clamps.

No. 118 M, 11 x 1⅞	rolls, per doz		$45.50
No. 120 M, 12 x 1⅞	"	"	53.50

Wide Reversible Clamps for Porcelain Tubs.

No. 118 W, 11 x 1⅞	rolls, per doz		$47.00
No. 120 W, 12 x 1⅞	"	"	55.00

Bench Wringer, Pat. Roller Bearings, Folding Bench that folds up at each side of Wringer.

No. 110 B, 10 x 1¾	rolls, per doz		$48.00
No. 112 B, 11 x 1¾	"	"	54.00
No. 114 B, 12 x 1¾	"	"	60.00
No. 118 B, 12 x 1⅞	"	"	60.00
No. 120 B, 12 x 1⅞	"	"	68.00

Good Idea Wringer.

Patent Roller Bearings. Regular Width Swing Clamps.

No. 102, 10 x 1¾	rolls, per doz		$29.00
No. 103, 11 x 1¾	"	"	33.00
No. 104, 12 x 1¾	"	"	37.00

Improved Continental.

Regular Width Swinging Clamps.

No. XX, 2½, 10 x 1¾	rolls, per doz		$24.00
No. XX, 2, 10 x 1⅞	"	"	28.00
No. XX, 1¼, 11 x 1¾	"	"	29.00
No. XX, 1½, 11 x 1⅞	"	"	34.00
No. XX, 1¾, 12 x 1¾	"	"	34.00

Double Sided Frame, Regular Width Reversible Clamps.

No. XX, 1½ R, 11 x 1⅞	rolls, per doz		$36.00
No. XX, 1 R, 12 x 2	rolls, per doz		54.00
No. XX, 3 R, 14 x 2	"	"	75.00

Double Sided Frame, Reversible Clamps, take in 3 inches.

No. XX, 1½ M, 11 x 1⅞	rolls, per doz		$37.50
No. XX, 1 M, 12 x 2	rolls, per doz		55.50
No. XX, 3 M, 14 x 2	"	"	76.50

Double Sided Frame, Wide Reversible Clamps for Porcelain Tubs.

No. XX, 1½ W, 11 x 1⅞	rolls, per doz		$39.00
No. XX, 1 W, 12 x 2	rolls, per doz		57.00
No. XX, 3 W, 14 x 2	"	"	78.00

New Princess.

Regular Width Swing Clamps.

No. 10, 10 x 1¾	rolls, per doz		$24.00
No. 12, 11 x 1¾	"	"	29.00
No. 14, 12 x 1¾	"	"	34.00
No. 16, 10 x 1⅞	"	"	28.00
No. 18, 11 x 1⅞	"	"	34.00
No. 20, 12 x 1⅞	"	"	44 50
No. 22, 10 x 2	"	"	34.00
No. 24, 11 x 2	"	"	44.50
No. 26, 12 x 2	"	"	52.00
No. 28, 14 x 2	"	"	75.00

Double Sided Frame. Regular Width Reversible Clamps.

No. 18 R, 11 x 1⅞	rolls, per doz		$36.00
No. 20 R, 12 x 1⅞	"	"	46.50
No. 22 R, 10 x 2	"	"	36.00
No. 24 R, 11 x 2	"	"	46.50
No 26 R. 12 x 2	"	"	54.00
No. 28 R, 14 x 2	"	"	75.00

Doubled Sided Frame. Medium Wide Reversible Clamps, take in 3 inches.

No. 18 M, 11 x 1⅞	rolls, per doz		$37.50
No. 20 M, 12 x 1⅞	"	"	48.00
No. 22 M, 10 x 2	"	"	39.50
No. 24 M, 11 x 2	"	"	48.00
No. 26 M, 12 x 2	"	"	55.50
No. 28 M, 14 x 2	"	"	76.50

Double-Sided Frame. Extra Wide Clamps for Porcelain Tubs.

No. 18 W, 11 x 1⅞	rolls, per doz		$39.00
No. 20 W, 12 x 1⅞	"	"	49.00
No. 22 W, 10 x 2	"	"	41.00
No. 24 W, 11 x 2	"	"	49.00
No. 26 W, 12 x 2	"	"	57.00
No. 28 W, 14 x 2	"	"	78.00

Extension Clamps for Porcelain Tubs.

No. 18 P, 11 x 1⅞	rolls, per doz		$45.00
No. 26 P, 12 x 2	"	"	65.00
No. 28 P, 14 x 2	"	"	85.09
No. 30 P, 14 x 2¼	"	"	128.00

Folding Bench that folds up at each side of the Wringer.

No. 10 B, 10 x 1¾	rolls, per doz		$44.00
No. 12 B, 11 x 1¾	"	"	49.00
No. 14 B, 12 x 1¾	"	"	53.00
No. 16 B, 10 x 1⅞	"	"	48.00
No. 18 B, 11 x 1⅞	"	"	53.00
No. 20 B, 12 x 1⅞	"	"	60.00
No. 22 B, 10 x 2	"	"	53.00
No. 24 B, 11 x 2	"	"	60.00
No. 26 B, 12 x 2	"	"	72.00

For Stationary Tubs, Reversible Water Boards. Regular Width Wooden Clamps.

No. 18 S, 11 x 1⅞	rolls, per doz		$44.50
No. 26 S, 12 x 2	"	"	65.00
No. 28 S, 14 x 2	"	"	85.00
No. 30 S, 14 x 2¼	"	"	128.00

For Stationary Tubs, Reversible Water Board. Wide Wooden Clamps.

No. 18 A, 11 x 1⅞	rolls, per doz		$46.00
No. 26 A, 12 x 2	"	"	66.50
No. 28 A, 14 x 2	"	"	86.50
No. 30 A, 14 x 2¼	"	"	129.50

For Stationary Tubs, Reversible Water Board and Extension Clamps, for Porcelain Tubs.

No. 18 E, 11 x 1⅞	rolls, per doz		$48.00
No. 26 E, 12 x 2	"	"	68.00
No. 28 E, 14 x 2	"	"	88.00
No. 30 E, 14 x 2¼	"	"	131.00

Princess.

Swing Clamps, Central Pressure Screw.

No. 10½, 10 x 1¾	rolls, per doz		$24.00
No. 12½, 11 x 1¾	"	"	29.00
No. 14½, 12 x 1¾	"	"	34.00

Princess Bench Wringer—With Folding Bench.

No. 10½ B, 10 x 1¾	rolls, per doz		$34.00
No. 12½ B, 11 x 1¾	"	"	39.00
No. 14½ B, 12 x 1¾	"	"	44.00

Geneva Purchase Gear Wringer.

Regular Width Clamp.

No. 203, 10 x 1¾	rolls, per doz		$36.00
No. 204, 11 x 1¾	"	"	43.00
No. 204½, 11 x 1⅞	rolls, per doz		47.00
No. 205, 12 x 1¾	"	"	50.00
No. 206, 12 x 1⅞	"	"	53.00

Wide Clamps for Stationary Tubs.

No. 204½, A, 11 x 1⅞	rolls, per doz.		$54.00
No. 206, A, 12 x 1⅞	"	"	60.00

Extension Clamps for Porcelain Tubs.

No. 204½, E, 11 x 1⅞	rolls, per doz.		$64.00
No. 206, E, 12 x 1⅞	"	"	70.00

Bench Wringer.—Folding Bench that folds up at each side of the Wringer.

No. 203, B, 10 x 1¾	rolls, per doz		$54.00
No. 204, B, 11 1¾	"	"	62.00
No. 204½, B, 11 x 1⅞	rolls, "		65.00
No. 205, B, 12 x 1¾	"	"	68.00
No. 206, B, 12 x 1⅞	"	"	72.00

Invincible.

Wooden Frame, Steel Spring.

No. 40, 10 x 1¾	rolls, per doz		$29.00
No. 42, 11 x 1¾	"	"	34.00
No. 44, 12 x 1¾	"	"	39.00

Swan.

Iron Frame, with Steel Spring.

No. 3½, 10 x 1¾	rolls, per doz		$28.00
No. 4½, 11 x 1¾	"	"	33.00
No. 5½, 12 x 1¾	"	"	38.00

Improved Rockford.

Wooden Frame, Swinging Iron Clamps.

No. XX 3, 10 x 1¾	rolls, per doz		$22.00
No. XX 13, 11 x 1¾	"	"	28.00
No. XX 23, 12 x 1¾	"	"	34.00

Brighton.

Wooden Frame, Swinging Iron Clamps.

No. 5, 10 x 1¾	rolls, per doz		$21.00
No. 15, 11 x 1¾	"	"	25.50
No. 25, 12 x 1¾	"	"	30.00

Newport.

Wooden Frame and Clamps.

No. 7, 10 x 1⅝	rolls, per dozen		$20.50
No. 17, 10 x 1¾	"	"	21.00
No. 27, 11 x 1¾	"	"	25.50

Hartford.

Wooden Frame and Clamps.

No. 9, 10 x 1⅝	rolls, per dozen		$20.50
No. 19, 10 x 1¾	"	"	21.00
No. 29, 11 x 1¾	"	"	25.50

Hartford Bench.

Folding Bench that folds up at each side of of the Wringer.

No. 9 B, 10 x 1⅝	rolls, per dozen		$40.00
No. 19 B, 10 x 1¾	"	"	41.00
No. 29 B, 11 x 1¾	"	"	46.00

Old Reliable.

No. 2, 10 x 1¾	rolls, per dozen		$21.00
No. 3, 11 x 1¾	"	"	25.00
No. 4, 12 x 1¾	"	"	30.00
No. 5, 14 x 1⅞	"	"	41.00
No. 6, 16 x 2	"	"	50.00

L. M. Co.

No. 2, 10 x 1¾	rolls, per doz		$19.50
No. 3, 11 x 1¾	"	"	24.00
No. 4, 12 x 1¾	"	"	28.00
No. 5, 14 x 1⅞	"	"	39.00
No. 6, 16 x 2	"	"	49.00

Cottage.

No. 2, 10 x 1¾	rolls, per doz		$20.00
No. 3, 11 x 1¾	"	"	24.00
No. 4, 12 x 1¾	"	"	28.00

Superb.

No. 2, 10 x 1¾	rolls, per doz		$18.50
No. 3, 11 x 1¾	"	"	22.50
No. 4, 11 x 1¾	"	"	26.50

Globe.

No. 2, 10 x 1¾	rolls, per doz		$18.50
No. 3, 11 x 1¾	"	"	22.50
No. 4, 12 x 1¾	"	"	26.50

Glass.—The condition of the Glass trade is usually one of quiet at this season of the year, and the present time shows no exception to the rule. Conditions are not favorable for a large volume of business and orders are small, covering only present necessities. Considerable attention is being paid to the collection of accounts, and the financial standing of customers is carefully scrutinized before goods are shipped. Such conservative action on the part of both the retailer and jobber cannot fail to bring about good results, as small stocks and unimpaired credit will give an impetus to trade when financial confidence is restored. The trouble in making collections to meet immediate obligations has not deranged prices, and goods are billed at regular quotations. It is reported that the wage committee of

Glass workers and manufacturers were to meet in New York July 12 to consider the scale of wages for the coming fire. The impression prevails that the plants will make an early start if a satisfactory agreement is arrived at. Quotations on Glass remain unchanged, as follows: American Window Glass, 2000 boxes at one time, 80 and 10 and 10 per cent. discount; carloads, 400 boxes, 80 and 15 per cent. discount; less quantities than carloads, 80 and 10 per cent. discount. Freight allowed on car lots and over, not to exceed 17½ cents per 100 pounds; less than car lots, f.o.b. at shipping point. French Window Glass, 75 and 10 and 5 per cent. discount. American Plate ranges in price from 50 and 10 and 7½ per cent. discount to 60 and 5 per cent. discount. Imported Plate Glass, 60 per cent. discount to 60 and 10 and 5 per cent. discount.

Old Rubber.—Old Rubber appears to be in better demand than other "old junk." Rubber shoes can be utilized for the greatest number of purposes and are, therefore, most sought for. Scarcity of funds for legitimate business purposes has affected the Old Rubber market, causing somewhat lower quotations on some grades of Rubber. That there is a market for these goods at quoted prices is a matter for congratulation, considering the present financial situation. The following are the current prices paid for Old Rubber delivered in New York:

Car Springs, ton lots, ℔ lb.	@	$0.03¼
Rubber Shoes, carloads ℔ lb.	@	.03⅛
Rubber shoes, less than carloads.	@	.03
Large Hose, ℔ ton	@	9.00
White Wringer Rolls, ℔ lb.	@	.04¼
White Syringes, ℔ lb.	@	.05

Old Rags, Paper, &c.—A peculiarity of the Paper Stock market at the present time is the difficulty of getting offers at any price, resulting in quotations being only nominal. Such a situation has not presented itself for years, when some one could not be found to make an offer, however ridiculously low it might be. We are advised that no Rags have been imported for the past 30 days, unless previously sold, and values have so declined that dealers are afraid to buy even at the lowest price, because of probable further decline. Cholera and tariff are factors which increase the market's future uncertainty. One redeeming feature in the situation is the fact that paper mills, though not buying stock, are running full time on stock previously purchased, and if this continues it is but a question of time when they will be obliged to go upon the market as buyers. The following are the current prices quoted for Old Rags, Paper, &c., delivered in New York:

No. 1 White Rags	℔ lb	3	@ 3⅛¢
No. 2 White Rags	℔ lb	2	@ 2⅛¢
Mixed Rags	℔ lb		1¼¢
Blues and 3ds	℔ lb		1¼¢
Hard Sized White Shavings	℔ lb		2¾¢
No. 1 White Book Shavings	℔ lb	2¼	@ 2⅜¢
No. 2 White Book Shavings	℔ lb	1½	@ 1¾¢
Light Book Shavings	℔ lb	⅛	@ 1¢
No. 1 Mixed Shavings	℔ lb		1¢
No. 2 Mixed Shavings	℔ lb		½¢
No. 1 Printed Books	℔ lb	1	@ 1¼¢
Ordinary Mixed Books	℔ lb	½	@ ¾¢
Newspapers	℔ lb		½¢
No. 1 Manila Paper	℔ lb	1¼	@ 1¼¢
No. 2 Manila Paper	℔ lb	⅞	@ 1 ¢
Bogus Paper	℔ lb	⅝	@ ¾¢
Common Paper	℔ lb	¾	@ 1⅛¢
Straw Chips	℔ lb	½	@ ⅝¢
Binders' Clippings	℔ lb	½	@ ⅝¢
Jute Butts	℔ lb		1¢
No. 1 Jute Bagging	℔ lb	1¼	@ 1⅜¢
Mixed Bagging	℔ lb		1¢
No. 2 Bagging	℔ lb		⅞¢
Hemp Twine	℔ lb		2¼¢
Manilla Rope	℔ lb		2¼¢
Jute Rope	℔ lb	1¾	@ 2¢
Mixed Rope	℔ lb	¾	@ ⅞¢

Old Metals.—It might be said that there are no market prices for Old Metals, as there is comparatively no business being done in this line. The rates at which money can be obtained are so high as to make it undesirable to accumulate stock, even at the low prices now ruling. The closing down of mills and decrease of manufactured product have caused a decrease in demand for Old Metals. The following are the current quotations for Old Metals in New York:

Heavy Copper	℔ lb	9½¢
Light and Tinned Copper	℔ lb	8½¢
Heavy Brass	℔ lb	7¢
Light Brass	℔ lb	6¢
Lead	℔ lb	3½¢
Tea Lead	℔ lb	3¼¢
Zinc	℔ lb	2¾¢
No. 1 Pewter	℔ lb	14¢
No. 2 Pewter	℔ lb	7¢
Wrought Scrap Iron	℔ gross ton,	$13.00
Heavy Cast Scrap	℔ gross ton,	9.00
Stove Plate Scrap	℔ gross ton,	6.00
Burnt Iron	℔ gross ton,	4.00
Mixed Bagging	℔ lb	1 ¢
No. 2 Bagging	℔ lb	⅞¢
Hemp Twine	℔ lb	2½¢
Manila Rope	℔ lb	2¾¢
Jute Rope	℔ lb	1¾ @ 2 ¢
Mixed Rope	℔ lb	¾ @ ⅞¢

Trade Notes.

The Bailey-Farrell Mfg. Company, Pittsburgh, Pa., refer in their advertising space to a little pamphlet on the subject of lead burning, which contains much that is of interest to the trade. Its title is "How to Solder Without Solder by the Augenous Process." The pamphlet contains full instructions to the amateur in the details of the machine and the management of the gases, with valuable suggestions and directions for practice. It is illustrated, and is sent by mail at $1 a copy.

Merchant & Co. of Philadelphia refer in their advertisement this week to Camaret Roofing Tin, which they state is still carried in stock by them in Philadelphia, New York, Chicago and New Orleans. Reference is made to the quality of this brand of Plate and to the fact that all orders with which the company may be intrusted will be promptly filled.

The Specialty Wood Working Company of Warren, Ohio, direct the attention of the trade this week to a line of polished and enameled Handles, Knobs, &c., which they are prepared to furnish. The goods are made in a variety of sizes adapted to meet different requirements, and are carefully illustrated in a catalogue which the company have issued. A copy of this publication will, we understand, be sent to any address on application.

Wrought-Iron Elevator Buckets stamped in one piece and made of any desired strength give an idea of the character of the work that can be turned out by W. J. Clark & Co., of Salem, Ohio. The stamping of special articles from Plate-Metal or Wrought-Iron is made a specialty by them and frequently their customers find an order placed with them saves considerable labor and some money.

The Salem Lock Company, Salem, Ohio, are steadily increasing their output of special Door Locks and yet the favor shown the goods by the dealers keeps the demand pleasantly in advance of the supply.

F. W. Walker of the Beaver Falls Art Tile Company of Beaver Falls, Pa., recently returned home from a satisfactory visit to New York. The great variety of Tile made by the company not only find appreciation from the interior decorator, but the fire place man, the modern plumber and the stovemaker find goods that suit their trade. Some of the Tile depend for ornamentation on beautiful tints and shading alone, while others combine with this effect elegant designs or figures. One of the recent productions is a Tile about 15 inches square, with a portrait of George Washington, and, as he was the pride of his country, it is the pride of the company.

The Sun Vapor Street Light Company of Canton, Ohio, find an ample field for their system in the growth of cities beyond the extension of the gas mains and where a supplement to electric lighting is indispensable. The system requires their street Lamp and provides a graduated filling apparatus for filling the tanks, which are in duplicate sets and necessitate the route being the same every night, and when the lighter is lighting the lamp the empty tank is removed and a tank substituted. This is filled to burn to a certain fixed time, so that at that time all of the lamps are extinguished owing to the supply being exhausted. They also make a Torch which is well adapted for lighting shops and foundries, and have a Lamp in a glass globe that, if the necessary labor was used to keep them clear of dust, would give a light that should enable more profitable service from workmen.

J. M. Hadesty of Tamaqua, Pa., is again in the market with his well-known Tapping Machine. We understand that the present style of the machine is giving much satisfaction to users, and insures a continued demand for it. Mr. Hadesty is issuing new circulars descriptive of the machine and its advantages.

The Rome, N. Y., Brass & Copper Company have elected the following trustees: Samuel O. Scudder, Wiley J. P. Kingsley, Bloomfield I. Beach, Harmon G. Utley, Allen M. Wardwell, Daniel G. Dorrance, William R. Huntington, Thomas H. Stryker, Jonathan S. Haselton.

The Riehle Bros. Testing Machine Company, Philadelphia, have just received an important order from the Civil Engineering Department of the Cornell University for a 400,000 pound Vertical Screw Power Testing Machine with all the latest automatic and electric attachments, recording diagram apparatus and special tools for testing girders up to 18 feet in length, transversely; also for crushing columns 10 feet high, and for applying tensile strain to rods, bars, &c., 10 feet long, stretching them, if necessary, 25 per cent. of their length before break

This machine is without doubt the largest Screw Power Testing Machine in the country, if not in the world. The Riehle Company not long ago placed a Horizontal Hydraulic Testing Machine of the same capacity (400,000 pounds, or 200 tons) in the Boston Navy Yard. This machine weighs by means of scale levers, and is the largest hydraulic machine with levers in the United States.

THE PITTSBURGH REDUCTION COMPANY of Pittsburgh, manufacturers of pure aluminum, with works at Kensington, Pa., have just closed a contract with the Niagara Falls Power Company whereby they will receive power to run a branch plant at that place for the reduction of aluminum. The firm will erect large buildings and expect to have the works in operation early next year.

THE NEW MACHINE SHOP of the Coe Brass Mfg. Company will be 40 feet wide and 300 feet long, two stories high. The building is designed and built by the Berlin Iron Bridge Company of East Berlin, Conn., and will be covered with their patent anti-condensation corrugated iron roofing.

F. W. BLOSSOM, 124 Water street, N. Y., who deals largely in Naval Stores, Turpentine, Rosin, Tar, &c., left New York June 17, for a trip to the Pacific Coast, combining business and pleasure. After seeing the Exposition at Chicago, a week was spent in the Yellowstone Park, after which Tacoma, Portland and San Francisco were visited in turn. He will return by way of Salt Lake City, Denver and St. Louis, taking a portion of the remaining time at his disposal to see the mountain scenery in Colorado about Denver.

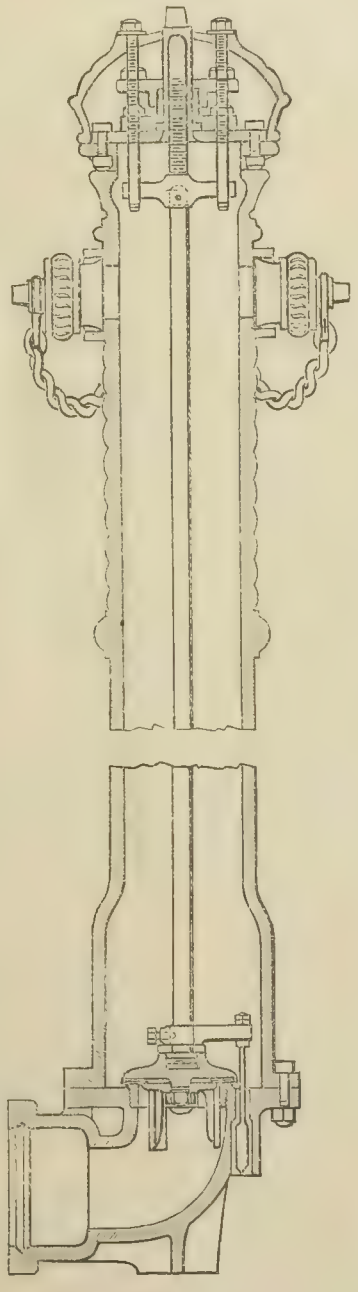
BELLEVUE PUMP COMPANY, Bellevue, Iowa, have recently made improvements in their Pumps, and refer to the satisfaction with which they are regarded, as evidenced in the largely increased demand. In their advertisement, which appears in this issue, a full description of their Galvanized Iron Tubing and Curb for Chain Pumps will be found. Further information in regard to their line is contained in the catalogue which they issue.

THE CHICAGO FOUNDRY SUPPLY COMPANY, whose Peerless Facing Mills are at Eighteenth and Rockwell streets, Chicago, have opened an office at 503 Teutonic Building, southeast corner of Washington street and Fifth avenue, in that city. They invite visiting foundrymen to call upon them at this central location, where every facility will be provided for attention to needed correspondence. The favor will doubtless be acceptable to many of those who are now making the pilgrimage to the World's Fair.

The manufacture of the Krag-Jorgensen rifle, with which first the regular army and afterward the National Guard regiments are to be equipped, has been begun at the Springfield armory. It is expected to replace the old Springfield rifle now in use in the army in about 18 months. The new weapon weighs only 8¾ pounds, and its barrel, 30 inches in length, is rifled with four grooves. The bullet of 220 grains is propelled by 37 grains of smokeless powder. It is unlubricated, covered with nickeled steel and is of such high velocity and penetration that when it strikes a bone it passes through without shattering it. It kills or disables more effectively than the old missile, but is more humane in that the chances of recovery from its cleaner wounds are far greater.

The Kennedy Fire Hydrant.

The sectional drawing here presented shows very clearly the component parts of the fire hydrant made by the Kennedy Valve Mfg. Company of 52 Cliff street, New York. The guide, stuffing box and cap are so arranged that in case of obstruction in the valve, or for necessary repairs to the main or piston drip valve, they can be removed out of the top of the hydrant, leaving the standpipe in the ground, and can be replaced in a few moments, thus obviating the necessity of digging up the standpipe. The hydrant has a positive drip, consisting of a very deep piston valve, the upper part of which has grooves to allow the water in the standpipe to flow through after the main valve has been closed. It is self-cleansing, for each time the drip is opened or closed it removes by its own action any obstruction or refuse that may have lodged in the drip. The hydrant will not freeze up where fair drainage exists, for the moment the main valve is closed all the water in the standpipe flows through the drip. The valve seats, bushing of the drip outlet and the wrench nut on top of the hydrant, are made of gun metal.



The Kennedy Fire Hydrant.

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CHICAGO, JULY 13, 1893.

Tin—

Straits pigs..... 22¢

Imported Tin Plates—

Charcoal Plates.—Bright.

Guaranteed Plates command special prices, according to quality.

		Per box.
Calland and Melyn Grade	IC, 10 x 14	@ $6.75
	IC, 12 x 12	@ 6.75
	IC, 14 x 20	@ 6.75
	IC, 20 x 28	@ 13.50
	IX, 10 x 14	@ 8.75
	IX, 12 x 12	@ 8.75
	IX, 14 x 20	@ 8.75
	IX, 20 x 28	@ 17.50
Allaway Grade,	DC, 12½ x 17	@ 6.50
	DX, 12½ x 17	@ 8.50
"	IC, 10 x 14	@ 6.50
"	IC, 12 x 12	@ 6.50
"	IC, 14 x 20	@ 6.50
"	IC, 20 x 28	@ 13.00
"	IX, 14 x 20	@ 8.00
"	IX, 20 x 28	@ 16.00

Coke Plates—Bright.

	Per box.
Steel Coke—IC, 10x14.14x20	@$6.00
IC, 14x20.90 ℔	@ 5.75
IC, 14x20, 100℔	@ 5.85
10 x 20	@ 9.00
20 x 28	@12.00
'X, 10x14, 14 x 20	@ 7.50
Grade. IC, 10x14, 14x20	@ 6.00

Charcoal Plates.—Terne.

Guaranteed Plates command special prices, according to quality.

Mansel and Dean Grades.—

IC. 14 x 20 ...@ $5.62½
20 x 28.....@ 11.25
IX. 20 x 28.....@ 14.25

Worcester Brand and equal.—

IC, 14 x 20.. 6.12½@ .....
IC, 20 x 28..12.25 @ .....
IX, 14 x 20.. 7.62½@ .....
20 x 28..15.25 @ .....

American Tin Plates.

Charcoal Plates.—Bright.

Irondale, A. A.—IC, 14 x 20.....$7.00
" " IX, 14 x 20..... 9.00
" " IXX, 14 x 20.....11.00
" " IC, 20 x 28.....14.00
" " IX, 20 x 28.....18.00
" " IXX, 20 x 28.....22 00

Florence.—
IC, 10 x 14, 12 x 12, 14 x 20..$6.75
IX, 10 x 14, 12 x 12, 14 x 20.. 8.75

Palma.—
IC, 10 x 14, 12 x 12, 14 x 20..$7.50
IX, 10 x 14, 12 x 12, 14 x 20.. 9.50

Each extra cross $2.00 and 20 x 28 double these prices.

Brilliant, Tissue Packed, IC, 14 x 20.$9.25
Royal, extra, IC, 14 x 20..... 7.25
Merion, IC, 14 x 20..... 7.00
Almond, IC, 14 x 20..... 6.50
Mint, IC, 14 x 20..... 6.25

Coke Plates.—Bright.

Elwood.—IC, 14 x 20.....$6.00
" IC, 20 x 28.....12.50

Roofing Plates.

Arch (205 ℔), 20 x 28.....@$11.75
Palm (205 ℔), 20 x 28 ..... @ 12.25
Crescent, IC, 20 x 28.....@ 12.50
Crescent, IX, 20 x 28.....@ 15.75
Empire, IC, 20 x 28.....@12 75
" IX, 20 x 28..... @16.00
Hickory, IC, 20 x 28.....@ 13.00
" IX, 20 x 28.....@ 16.10
Alaska (heavily coated), IC, 20x28@$14.50
Alaska IX, 20 x 28.....@ 17.75
Special, IC, 20 x 28.....@ 15.00
" IX, 20 x 28.....@ 18.25
Merchant's Roofing (extra coated), IC, 20 x 28.....@$17.75
Merchant's Roofing (extra coated), IX, 20 x 28.....@$21.50
Merchant's Old Method, (extra heavily coated), IC, 20 x 28.....@$19.75
Merchant's Old Method (extra heavily coated), IX, 20 x 28.....$23.60
Irondale A:
IC, 14 x 20..... $6.25
IX, 14 x 20. ..... 7.75
IC, 20 x 28..... 12.50
IX, 20 x 28..... 15.50
Westmoreland:
IC, 14 x 20 ..... $6.25
IC, 20 x 28..... 12.50
Elwood:
IC, 20 x 28 ..... $12 00
Juno:
IC, 14 x 20..... $5.75
IC, 20 x 28..... 11.50
Scott's Extra Coated, Stamped and Resqured, IC, 14 x 20 .....$9.50
Scott's Extra Coated, Stamped and Resqured, IX, 14 x 20 .....11.00
Scott's Extra Coated, Stamped and Resqured, IC, 20 x 28.....19.00
Scott's Extra Coated, Stamped and Resqured, IX, 20 x 28..... 22.00
Neville, Stamped, IC, 14 x 20 ..... 6.25
" " IX, 14 x 20..... 7.50
" " IC, 20 x 28 ..... 12.50
" " IX, 20 x 28..... 15.00
Taylor's Old Style, IC, 14 x 20 (Stamped and Resqured).....$9.50
Taylor's Old Style, IC, 20 x 28 (Stamped and Resqured).....19.00
Taylor's Roofing, IC, 14 x 20 (Stamped and Resqured)..... 8.25
Taylor's Roofing, IC, 20 x 28 (Stamped and Resqured).....16.50
Columbia, IC, 14 x 20 (Stamped).... 7.25
" IC, 20 x 28 (Stamped)....14.50
Maple, IC, 14 x 20 (Stamped)..... 6.75
" IC, 20 x 28 (Stamped).....13.50
Willow, IC, 14 x 20..... 6.50
" IC, 20 x 28.....13.00
Knoxall, IC, 14 x 20 ..... 6.25
" IC, 20 x 28..... ....12.50
Globe, IC, 14 x 20..... 6.00
" IC, 20 x 28 .....12.00
Miami, IC, 14 x 20..... ..... 6.00
" IC, 20 x 28..... .....12.00
" IX, 20 x 28.....15.00
" (Redipped), IC, 20 x 28.....17.00

Tin Boiler Plates.

	Per box of 100 sheets.	Per box of 112 sheets.
X, 14 x 28	$13.00	$13.00
XX, 14 x 28	14.50	14.50
X, 14 x 31	14.50	15.80
XX, 14 x 31	16.50	17.50
X, 14 x 56	29.50	16.50
XX, 14 x 56	32.50	18.20
X, 14 x 60	31.50	17.65
XX, 14 x 60	35.50	20.90

Sheet Iron—

Black.

	Common American	Refined.
Nos. 10 to 16	℔ 2 7-10¢	3 3-10¢
17 to 20	℔ 2 8-10¢	3 4-10¢
21 to 24	℔ 2 9-10¢	3½¢
25 and 26	℔ 3¢	3 6-10¢
27	℔ 3 1-10¢	3 7-10¢

Russia, Planished, &c.

Genuine Russia, all numbers....13¢ net.
Patent Planished....℔ A, 10¼¢; B, 9¼¢ dis. 5%

Galvanized.

List on following page.
Juniata or first quality.....dis. 70&2½%

Copper—

Ingot.

Lake.....12¢ @ 12½¢
Casting Brands.....11¢ @ 11½¢

Sheet and Bolt.

List on following page. Discount to retailers, 25%.

Copper Bottoms.

List on following page. 25%.

Seamless Brass and Copper Tubes.

Base price, 17½¢, Chicago, with extras according to size.

Copper, Bronze and Gilding Tube, 3¢ ℔ additional.

Brazed Brass Tubing.
(To No. 20 inclusive.)

Add freight from New York to Chicago to these prices, or 50¢ ℔ 100 ℔.

Above 5-16 inch to 3 inch inclu...35¢
Plain, above 3 inch.....45¢
Plain, 5-16 inch .....45¢
Plain, ¼ inch.....60¢
Plain, 3-16 inch.....$1.00
Plain, ⅛ inch.....$1.50
Fancy Tubing, Brass, to No. 20 incl.....43¢ ℔
Bronze Tubing, 3¢ ℔ more than Brass.....

35 @ 40 %

Roll and Sheet Brass.

List on following pages. 35 @ 40%.

Slab Spelter—

Western Spelter.....5

Sheet Zinc—

600 ℔ casks.....6¼¢
Less than Casks, ℔.....6½¢

Lead—

Soft Pig Lead.....4¼¢
Bar.....4.60¢@5¢
Pipe.....5½¢, dis. 10¢
Block Tin Pipe.....35¢
Sheet.....6¢, dis. 10%

Solder—

½&½.....13¼¢@13⅞¢
Extra Wiping.....12¢

The prices of the many other qualities of Solder in the market indicated by private brands vary according to composition.

Antimony—

Cookson.....12½¢@13¼¢
Hallett's.....11½¢@12½¢

Wire—See *Hardware.*

Wrought-Iron Pipe—

List on following page.

1¼ and under, Plain.....60&10%
1¼ and under, Galv.....52½&10%
1½ and over, Plain.....70&10%
1½ and over, Galv.....60&10%
Boiler Tubes, list Oct. 24, 1892...65@67½%
Casing, list Nov. 16, 1892.....62½%
Inserted Joints Casing, list Nov. 16, 1892.....47½%
Steel Boiler Tubes.....27½%
Cold Drawn Seamless Steel Tubing...50%

Cast-Iron Soil Pipe—

Cast-Iron Soil-Pipe, Tarred; sizes 2 to 6 inches, inclusive.....dis 70&2½%
Other sizes.....dis 60%

Leader Pipes—

Abendroth's Galv. Spiral Riveted.....60%
Austin's Corrugated.....60%
Gordon & Gilbert's Corrugated.....60%
Ritchie's (Galv. Iron only) Cor'd.....60%
Ritchie's Spiral Lock Seam, Galv'd....55%
Austin's Spiral Ribbed Pipe.....60%
Plain Adjustable Elbows.....60%
James A. Miller Bros. (Galv'd Iron only) Corrugated.....60%

Furnace Fittings—

Discount from Excelsior Steel Furnace Co.'s list.....50%

Steel Roofing—

Perfection.....$3.75 square
Climax.....$3.50 square
The Lloyd Spanish Tiling....$4.50 square

Metallic Shingles—

Cushman's.....$1.25 square
Merchant & Co.'s Spanish Tiles:
Copper, 14 oz.....$36.00 square
Steel, painted.....$9.00 square

Drain Pipe—

Discount from list.....50%

Paints Oils, &c.—

Deodorized Benzine.....7½@8 ¢
Iron Paint, Bright Red.....℔ lb, 2 ¢
" " Brown.....℔ lb, 1½¢
" " Purple.....℔ lb, 2½¢
" Ground in oil, B. Red ℔ lb, 6½¢
" Ground in oil, Red..℔ lb, 6½¢
" Ground in oil, Brown ℔ lb, 5½¢
" Ground in oil, Purple ℔ lb, 6 ¢
Linseed Oil, Boiled, in bbls.....53¢
Linseed Oil, Raw, in bbls.....50¢
Mineral Paints.....2@4¢
Orange Mineral.....10¾¢
Pure White Lead in Oil.....6¾@7½¢
Dry White Lead in bbls.....6¼@6¾¢
Red Lead, American.....7@7½¢
Red Venetian, English, dry...$1.65@$1.70
Red Venetian in oil; asst'd cans, 8½¢; kegs.....7¾¢
Sipe's Japan Oil, in bbls, ℔ gal..... ..34¢
Spirits Turpentine, in bbls., ℔ gal..34½¢
Asphaltum, Trinidad Refined, ℔ ton..$45
Tarred Felt, 1 Ply, ℔ 100 ℔.....$1.65
Tarred Felt, 2 Ply, ℔ roll 108 sq. feet.....$1.50
Tarred Felt, 3 Ply, ℔ roll of 108 sq. feet.....$2.00
Roofing Pitch, ℔ bbl. of 300 ℔.....$3.20

NEW YORK, JULY 14, 1893.

Aluminum—

No. 2 Grade Metal, in ton lots..℔ lb, $0.75
No 1 (guaranteed to be 98 % pure and over), in ton lots .....℔ lb .90
Lots less than 1 ton, 10¢ ℔ lb additional.

Antimony—

Cookson .....℔ lb, 11¢
Hallett's.....℔ lb, 10½¢

Brass—

Planished.....net
Roll and Sheet.....35@40%

Brass and Copper Tubes
Brazed Brass Tubing—

List May 20, 1889.

	Per ℔.
Plain, to No. 20 inclusive, above 5-16 inch to 3 inch inclusive	$0.35
Plain, to No. 20, above 3 inch	45
Plain, 5-16 inch to No. 20	45
Plain, ¼ inch	60
Plain, 3-16 inch	1.00
Plain, ⅛ inch	1.50
Fancy Tubing to No. 20, inclu	43

35@40%

Copper and Bronze Tubing—

3¢ ℔ lb more than brass.

Bronze, Tobin—

Drawn Rods for Bolts, Forgings, &c

Over ¼ to 3½ inches inclusive....17¢ ℔ lb
Over 3½ to 5 inches inclusive.....18¢ ℔ lb

Piston Rods, Finished True, Smooth and Straight.

Over ¼ to 3½ inches inclusive....18¢ ℔ lb
Over 3½ to 5 inches inclusive.....19¢ ℔ lb

Clips—

Buffalo Damper: Nos. 1, $1.25; 2, $2.50 per doz.....40&10%

Conductors—

Corrugated. *Round or Square—*
Galvanized.....60%
Galvanized, Locked Joints.....60%
Tinned.....60%

Spiral Riveted—

Galvanized.....50%

See also *Elbows and Shoes; Eave-Trough Miters; Strainers, Conductor.*

Conductor Strainers—See *Strainers, Conductor.*

Copper—

Bottoms, Pits and Flats.....15@25%

Ingot.

Lake.....11½¢
Ansonia Grade Arizona.....11¢
Ansonia Grade Casting.....10½¢
Planished.....net
Sheet and Bolt.....25@30%

Tubes — See *Seamless Brass Tubes.*

Coppers, Soldering—

See *Irons, Soldering*, in Current Hardware Prices.

Damper Clips Buffalo—

See Clips, Buffalo Damper.

Eave Troughs—

Lap or Slip Joint, Galvanized.....60%
Lap or Slip Joint, Terne.....50%

Eave-Trough Mitres—

Lap or Slip Joint.....list, net

Elbows—
Plain Adjustable—

Tin.....70%
Galvanized.....70%

Crimped Tubing—

Re-Tinned or Galvanized.....35%

Stove-Pipe—

Buffalo Four-Piece.

4½	5	5½	6	7 inch,
$0.78	.87	.90	.99	1.20 per doz..20 %

Elbows and Shoes—

Flat Crimp.

Tin.....35%
Galvanized 35%

Corrugated.
Flat Crimp.

Galvanized.....60%

Round or Square.

Tin.....60%
Galvanized.....60%

Iron, Sheet—

Black.

	Common American.	R. G. Cleaned American.
Nos. 10 to 16	℔ lb, 2¾@....	3¼¢
Nos. 17 to 20	℔ lb, 3 @....	3¼¢
Nos. 21 to 24	℔ lb, 3¼@....	3½¢
Nos. 25 and 26	℔ lb, 3¾@....	3¾¢
No. 27	℔ lb, 3½@....	3¾¢
No. 28	℔ lb, 3⅝@....	3⅞¢
American B. B.	℔ lb, 4¢@4½¢	

Russia, Planished, &c.

Genuine Russia, according to assortment.....℔ lb, 12@13¢
Patent Planished....℔ lb, A, 10¢; B, 9¢, 5%
Craig Polished Sheet.....℔ lb, 8½¢

Galvanized.

	B. B.
Nos. 10 to 16	℔ lb, 4¢
Nos. 17 to 22	℔ lb, 4¼¢
Nos. 23 to 24	℔ lb, 4½¢
Nos. 25 to 26	℔ lb, 4¾¢
No. 27	℔ lb, 5¢
No. 28	℔ lb, 5¼¢
Nos. 29 and 30	℔ lb, 6¼¢

Filter Joints—

Lee's.....33⅓ %

Lead—

American Pig.....4¢
Bar.....4½¢

New York Prices.

Pipe.....6½¢, 20%
Tin Lined Pipe.....15¢, 20%
Block Tin Pipe.....37½¢, 20%
Sheet.....7¢, 20%
Old Lead in exchange, 3½¢ ℔ lb.

Pittsburgh Prices.

Lead Pipe in whole coils.℔ lb, .05¢,10&5%
Sheet Lead in whole coils.℔ lb, .05½¢, 10&5%

Metal, Expanded—
Manufacturers' list No. 5.

Lathing.....10%
Fencing, Painted Sheets.....20%
Netting, Painted Sheets.....20%
Door Mats, Galvanized.....25%
Window Guards, Paneled.....15%
Tree Guards, Paneled.....15%

Mitres Eave-Trough—See *Eave-Trough Mitres.*

Paints Oils &c.—

Lead, Amn. White, Dry or in oil:
Kegs, lots less than 500 ℔.... 7 @ 7¼
Kegs, lots 500 ℔ to 5 tons ... 6¾ @ 6⅞
Kegs, lots 5 tons to 12 tons... 6⅝ @ 6¾
Kegs, lots 12 tons and over.. 6¼ @ 6½
Lead, White, in oil, 25 ℔ tin pails, add to keg price. ... @ ¼
Lead, White, in oil, 12½ ℔ tin pails, add to keg price..... ... @ 1
Lead, Red, bbls. and ½ bbls... 6 @ 7
Lead, Red, kegs .... 6¼ @ 7¼
Ocher, American ..... ½ @ 1¾
Red, Venetian, American..... ℔ 100 lb..1.00 @ 1.10

Linseed Oil:
City, raw, ℔ gal..... .. @ .50
City, boiled..... .. @ .53
Western, raw..... .. @ .50

Spirits Turpentine:
In regular bbls.....28½ @ . 29
In machine bbls.... . .. 29 @ .29½

Putty:
In barrels and ½ bbls..... .01⅝ @ .01¾
In tubs.....01⅝ @ .01¾
In tin cans .....01½ @ .02¼
In bladders .....01⅝ @ .02¼

Roofing Material, &c.:
Asphaltum, Trinidad Refined, ℔ ton. .....$30.00@$35.00
Asphaltum, Rock, ℔ ton.....$14.00
Coal Tar Felt, 1 Ply, ℔ lb.....2¢
Coal Tar Felt, 2 Ply, ℔ roll 108 sq. ft. $1.42½
Coal Tar Felt, 3 Ply, ℔ roll 108 sq. ft. $1.85
Roofing Pitch, ℔ bbl.....$2.24

Pipe, Drain 50%

Pipe and Fittings, Cast Iron Soil—

Cast-Iron Soil Pipe, Tarred, sizes 2 to 6 inches, inclusive.....60@60&10%
Other sizes.....65@55&10%
Cast-Iron Fittings, Tarred, sizes 2 to 6 inches.....60@60&10%
Other sizes.....65@55&10%

Pipe, Spiral—

Galvanized.....60%
Tin.....60%

Pipe, Wrought Iron—

For discounts see Current Hardware Prices.

Polish, Stove—

Raven Liquid:
6 oz. bottles, ℔ gro $8.00
8 oz. bottles, ℔ gro.....$9.00
Water Polish $7.20

Rivets and Burrs—

For discounts see Current Hardware Prices.

Rock and Slag Wool—

	₱ lb	₱ cub. foot.
Slag Wool, ordinary	1¼	19¢
Slag Wool, extra	4¼	38½¢
Rock Wool, ordinary	2¾	27¢
Rock Wool, extra	7¼	43½¢

Rosin—

Common and Good—Strained,	
Rosin, C. & D	₱ bbl. $1.18@$1.20
Rosin, E. & F	₱ bbl. $1.30@$1.40
Rosin, G. & H	₱ bbl. $1.55@$1.90
Rosin, I. & K	₱ bbl. $2.35@$2.90
Rosin, M. & N	₱ bbl. $3.40@$4.00

Seamless Brass Tubes..net

Shoes and Elbows—See *Elbows and Shoes.*

Slate Roofing—

According to size, f.o.b. cars, Quarry Station.

Pennsylvania:	
Best Bangor, ₱ sqr	$3.25@$4.50
Pen Argyle, ₱ sqr	3.50@ 4.25
Peach Bottom, ₱ sqr	5.00@ 6.25
No. 1 Chapman, ₱ sqr	4.00@ 4.65
Lehigh Slates, ₱ sqr	3.00@ 4.50
Vermont:	
Sea Green, ₱ sqr	2.70@ 3.20
Purple, ₱ sqr	3.50@ 4.50
Unfading Green, ₱ sqr	3.50@ 4.00
Red, ₱ sqr	9.75@12.00

Solder and Soldering Fluids—

Solder—

½ & ⅓ (Guaranteed)	13½@15¢
No. 1	11¾@12½¢

Prices of Solder indicated by private brands vary according to composition.

Soldering Fluids—

Concentrated Soldering Flux.
f.o.b. New York.

In barrels, ₱ lb	4¢
Smaller quantities, ₱ lb	5¢

Gedney's Soldering Fluid.

In carboys or barrels, ₱ lb	2¢

$1.50 for ca rboy or barrel; money refunded when returned.

Perfection Soldering Flux.
No charge for package.

Bbls., about 500 lb, ₱ lb	3½¢
½ bbls., about 300 lb, ₱ lb	4¢
Kegs, about 110 lb, ₱ lb	4¢
75¢ extra for keg.	5 % dis.
Kegs, about 55 lb, ₱ lb	4¢

Yager's Soldering Salts.

¼-lb bottles, each	30¢
Large quantities, per lb	40¢

Spelter—

Western Spelter	5¢@5¼¢
Bertha	8¢

Spiral Pipe—See *Pipe, Spiral.*

Stove-Pipe Elbows—*See Elbows. Stove Pipe.*

Stove Polish—See *Polish, Stove.*

Stove Trucks—See *Trucks, Stove.*

Strainers Conductor—

Galvanized	60%

Tin, Pigs and Bars—

Banca, pigs, ₱ lb	20½@21¢
Straits, pigs, ₱ lb	21¢
Straits in bars, ₱ lb	22¢

Tin Plates—

American Terne Plates—

Apollo Roofing.

IC, 14 x 20	$6.25
IC, 20 x 28	12.50
IX, 14 x 20	7.25
IX, 20 x 28	14.50

Buckeye.

IC, 14 x 20	$7.00
IC, 20 x 28	14.00
IX, 14 x 20	8.25
IX, 20 x 28	16.50
IXX, 14 x 20	9.50
IXX, 20 x 28	19.00

De Mill's.

First New York, IC, 14 x 20	$5.75
" " " IC, 20 x 28	11.50
First New Jersey, IC, 14 x 20	5.75
" " " IC, 20 x 28	11.50
Manhattan, IC, 14 x 20	7.25
" IC, 20 x 28	14.50

Dunlap's.

Double Dipped, IC, 14 x 20	$8.25
" " IC, 20 x 28	16.50
" " IX, 14 x 20	9.50
" " IX, 20 x 28	19.00
Domestic, IC, 20 x 28	12.00
" IX, 20 x 28	15.00

Glendale Tin Plate Co.

Optimus, Best Redipped, IC, 14 x 20	$8.25
" " " IC, 20 x 28	16.50
" " " IX, 14 x 20	9.75
" " " IX, 20 x 28	19.50
N. F., Old Style, IC, 14 x 20	7.50
" " " IC, 20 x 28	15.00
" " " IX, 14 x 20	9.00
" " " IX, 20 x 28	18.00
Bonus, Extra Coated, IC, 14 x 20	6.75
" " " IC, 14 x 20	8.25
" " " IC, 20 x 28	13.50
" " " IX, 20 x 28	16.50

Hamilton's.

Hamilton's Best Redip'd, IC, 14x20	$9.25
" " " IC, 20x28	18.50
" " " IX, 14x20	10.75
" " " IX, 20x28	21.50
Osceola Hand Coated, IC, 14x20	8.25
" " " IC, 20x28	16.50
" " " IX, 14x20	9.75
" " " IX, 20x28	19.50
Lula Best Charcoal, IC, 20x28	12.50
" " " IX, 20x28	16.00

Laufman's.

Apollo, IC (Resquared), 14 x 20	$8.12
Apollo, IX (Resquared), 14 x 20	9.37
Apollo, IC (Resquared), 20 x 28	16.00
Apollo, IX (Resquared), 20 x 28	18.50
Apollo, IC (Resquared), 20 x 56	16.00
Apollo, IX (Resquared), 20 x 56	18.50
Tip Top, IC (Resquared), 14 x 20	6.62
Tip Top, IX (Resquared), 14 x 20	7.88
Tip Top, IC (Resquared), 20 x 28	13.00
Tip Top, IX (Resquared), 20 x 28	15.50
Allegheny, IC, 14 x 20	6.12
Allegheny, IX, 14 x 20	6.38
Allegheny, IC, 20 x 28	12.00
Allegheny, IX, 20 x 28	12.50

Merchant's.—All Stamped

Crescent, IC, 20 x 28	$12.00
Crescent, IC, 14 x 20	6.00
Hickory, IC, 20 x 28 (Resquared)	12.75
Hickory, IC, 14 x 20 (Resquared)	6.37½
Empire, IC, 20 x 28	12.25
Empire, IC, 14 x 20	6.12½
Alaska, IC, 20 x 28 (Resquared)	14.00
Alaska, IC, 14 x 20 (Resquared)	7.00
Merchant's Roofing, IC, 20 x 28 (Resquared)	17.00
Merchant's Roofing, IC, 14 x 20 (Resquared)	8.50
Merchant's Old Method, IC, 20 x 28 Resquared)	19.00
Merchant's Old Method, IC, 14 x 20 (Resquared)	9.50

Pittsburgh Tin-Plate Works.

Kensington:	
IC, 14 x 20	$6.75
IC, 20 x 28	13.50
IX, 14 x 20	8.00
IX, 20 x 28	16.00
Westmoreland:	
IC, 14 x 20	$6.25
IC, 20 x 28	12.50
Juno:	
IC, 14 x 20	$5.75
IC, 20 x 28	11.50

Scott's.—All Stamped.

Scott's Extra Coated, IC, 14 x 20 (Resquared)	$9.25
Scott's Extra Coated, IX, 14 x 20 (Resquared)	10.75
Scott's Extra Coated, IC, 20 x 28 (Resquared)	18.50
Scott's Extra Coated, IX, 20 x 28 (Resquared)	21.50
Neville, IC, 14 x 20	6.00
" IX, 14 x 20	7.25
" IC, 20 x 28	12.00
" IX, 20 x 28	14.00

N. & G. Taylor Co.'s.

Taylor, Old Style, IC, 14 x 20 (Stamped and Resquared)	$9.25
Taylor Old Style, IC, 20 x 28 (Stamped and Resquared)	18.50
Taylor Roofing, IC, 14 x 20 (Stamped and Resquared)	8.00
Taylor Roofing, IC, 20 x 28 (Stamped and Resquared)	16.00
Columbia, IC, 14 x 20 (Stamped)	7.00
Columbia, IC, 20 x 28 (Stamped)	14.00
Maple, IC, 14 x 20 (Stamped)	6.50
Maple, IC, 20 x 28 (Stamped)	13.00
Willow, IC, 14 x 20	6.25
Willow, IC, 20 x 28	12.50
Knoxall, IC, 14 x 20	6.00
" IC, 20 x 28	12.00
Globe, IC, 14 x 20	5.75
Globe, IC, 20 x 28	11.50

A. A. Thompson & Co.'s.

Old Colony, IC, 14 x 20	$8.00
" " IC, 20 x 28	16.00
Thompson's Puritan, IC, 14 x 20	5.75
" " IC, 20 x 28	11.50
Durham, IC, 14 x 20	5.75
" IC, 20 x 28	11.50
Central, IC, 14 x 20	5.45
" IC, 20 x 28	10.75
" WC, 14 x 20	5.25
" WC, 20 x 28	10.25
Tarn, IC, 20 x 28	10.50

U. S. Brands.—All Stamped.

U. S. Monongahela, IC, 14 x 20	$6.50
U. S. Redipped, IC, 14 x 20	9.25

20 x 28 double the price of 14 x 20

American Bright Plates—

Merchant's.

Merchant's Dipped, IC, 14x20	$11.00
Palma Xtra, IC, 14x20	7.25
Florence, IC, 14x20	6.75

N. & G. Taylor Co.'s.

Brilliant, Tissue Packed, IC, 14x20	$9.00
Royal, extra, IC, 14x20	7.00
Merlon, IC, 14x20	6.75
Linden, IC, 14x20	6.50
Almond, IC, 14x20	6.25
Mint, IC, 14x20	6.00

U. S.

IC, 14x20	$7.25
IC, 20x28	14.50

Imported Terne Plates—

Charcoal.

Dean Grade.—IC, 14 x 20	@$5.65
20 x 28	@11.00
IX, 14 x 20	@ 6.40
20 x 28	@12.80
Abercarne Grade.—IC, 14 x 20	@ 5.55
20 x 28	@10.80
IX, 14 x 20	@ 6.40
20 x 28	@12.80

Imported Bright Plates—

Charcoal.
Duty: 2.2¢ ₱ lb.

Melyn and Cal-	
land Grade. IC, 10 x 14	@$6.50
" " IC, 12 x 12	@ 6.75
" " IC, 14 x 20	@ 6.50
" " IC, 20 x 28	@13.00
" " IX, 10 x 14	@ 8.50
" " IX, 12 x 12	@ 8.75
" " IX, 14 x 20	@ 8.50
" " IX, 20 x 28	@17.00
" " DC, 12½ x 17	@ 6.00
" " DX, 12½ x 17	@ 8.00
Allaway Grade. IC, 10 x 14	@ 6.00
" " IC, 12 x 12	@ 6.25
" " IC, 14 x 20	@ 6.00
" " IC, 20 x 28	@12.00
" " IX, 10 x 14	@ 7.50
" " IX, 12 x 12	@ 7.75
" " IX, 14 x 20	@ 7.50
" " IX, 20 x 28	@15.00
" " DC, 12½ x 17	@ 5.50
" " DX, 12½ x 17	@ 7.00

Coke.

Steel Coke.—IC, 10x14, 14x20	$5.40@$5.50
10x20	@ 8.50
20x28	11.50@12.00
IX, 10x14, 14x20	@ 7.00
B. V. Grade.—IC, 10x14, 14x20	@ 5.60

Imported Boiler Plates.—

IXX, 14x28..(112 sheets)	@$13.35
IXX, 14x28..(112 sheets)	@ 14.50
IXX, 14x31..(112 sheets)	@ 16.00

Tinning—

Brass and Copper.....net

Tubing—

Tin	55%
Galvanized	55%

Troughs, Eave—See *Eave Troughs.*

Trucks Stove—

Improved Lock Frame, per doz	$15.00
Steel Lock Frame, per doz	18.00

Iron Wire—

See *Hardware Prices.*

Brass and Copper.—

Standard List	30@35%

Zinc—

600 lb casks	6¾¢
Per lb	7¢

MANUFACTURING.

Machinery.

The Riehle Bros. Testing Machine Company, Philadelphia, have just received an important order from the Civil Engineering Department of the Cornell University for a 400,000 pound vertical screw power testing machine with all the latest automatic and electric attachments, recording diagram apparatus and special tools for testing girders up to 18 feet in length, transversely; also for crushing columns 10 feet high, and for applying tensile strain to rods, bars, &c., 10 feet long, stretching them, if necessary, 25 per cent. of their length before breaking This machine is without doubt the largest screw power testing machine in the country, if not in the world. The Riehle Company not long ago placed a horizontal hydraulic testing machine of the same capacity (400,000 pounds or 200 tons) in the Boston Navy Yard. This machine weighs by means of scale levers, and is the largest hydraulic machine with levers in the United States.

The Diamond Machine Company of Providence, R. I., are in position to fill orders for their regular goods promptly. The recent destruction of their property did not include their patterns. They have secured about three acres of most desirable property in Providence upon which new and modern factories will be erected, one of which will be in operation and running October 15, 1893.

Jenkins Brothers of 71 John street, New York, have made an improvement in the manufacture of a rubber compound for use on high pressure steam. For nearly two years they have been using and testing this rubber compound in the manufacture of Jenkins Disks, and the results have been more than satisfactory. They have passed the experimental stage and regard it as the greatest advancement made by them in the manufacture of their specialties.

Alfred Box & Co. of Philadelphia, are engaged on quite a number of traveling cranes, with capacities of 25 to 30 tons, and for traveling spans of 40 to 60 feet. Most of them are for use in electric light stations. The firm report business pretty brisk and have orders ahead which will keep their works running at their fullest capacity for some time.

The Gartland Foundry Company, Cleveland, Ohio, will begin work August 1. They start business with a large number of orders booked.

The Rensselaer Valve Works, Cohoes, N. Y., have just completed two large valves, weighing 10,000 pounds apiece, for a Rochester, N. Y., concern, and an order has been received from a firm in Buffalo for a 60-inch valve that will weigh 8 tons, and will be the largest ever made.

The machine, wood working and tin shops comprising the principal buildings of the North American Mill Building Company's works at Stratford, Ont., have been burned at a loss of $30,000.

The new Fitzgibbons Boiler Works, at Oswego, N. Y., have been put in operation. The first work turned out of the shop will be a 90 horse-power high-pressure boiler. The new concern will give particular attention to furnishing boilers for electric-light work and heating purposes. Already two firms manufacturing high-grade engines for electric light work have negotiated to use the Fitzgibbons boiler. The proprietor states that the outlook promises a prosperous season, with plenty of work. The old plant will be utilized by the boiler manufacturers for the present for repairs and light work connected with boiler manufacture.

The Bucyrus Steam Shovel and Dredge Works have ceased to operate at Bucyrus, Ohio, the balance of the machinery having been shipped to the new works at South Milwaukee, Wis.

Miscellaneous.

The final organization of the company who have purchased the J. S. Newmyer coal field of 2000 acres near Perryopolis, Pa., was completed at Dawson, Pa., last week and the application for a charter has been forwarded to Harrisburg. The land having originally been owned by George Washington, the company adopted as their name the Washington Coal and Coke Company.

The Berlin Iron Bridge Company of East Berlin, Conn., have received from E. D. Leavitt, consulting engineer of the Calumet & Hecla Mining Company, contract for the iron roof over their new engine house. The building will be 80 feet wide and 200 feet long.

The New York Shipbuilding & Engine Company will establish a ship yard at Whitestone, N. Y. President, E. A. Stevens (Hoboken Ferry Company); superintendent-engineer, C. D. Mosher; nav.-architect, William Gardner.

The Pittsburgh stockholders of the Westinghouse Brake Company, Limited, of London, England, recently received copies of a circular notifying them of a proposed issue of $250,000 worth of 5 per cent. bonds and which reads as follows: "You will be aware of the large increase which has taken place in the business of this company during the past three years, and of the handsome dividends which have been paid to the stockholders. The lease of the company's original works in London and Paris has recently terminated; and the company have acquired freehold land near Paris, and further freehold land at Hanover, in addition to their freehold property at York road, King's Cross, London. The lease for upward of 50 years of about an acre of ground adjacent to the company's freehold estate in York road had also been purchased. On part of the latter a foundry is in course of erection, and new and well equipped works have been built on the company's freehold in York road, as well as near Paris and at Hanover."

Current Hardware Prices.

JULY 14, 1893.

Note.—The quotations given below represent the Current Hardware Prices which prevail in the market at large. They are not given as manufacturers' prices, and manufacturers should not be held responsible for them. In cases where goods are quoted at lower figures than the manufacturers name, it is not stated that the manufacturers are selling at the prices quoted, but simply that the goods are being sold, perhaps by the manufacturers, perhaps by the jobbers at the figures named.

The character @ is used to indicate a range of price; thus discount 50&10@50&10&5 % signifies that the goods in question are sold at prices ranging from discount 50 and 10 % to discount 50 and 10 and 5 %.

Adjusters, Blind—

Domestic.....₩ doz $3.00, 33⅓%
Excelsior....₩ doz $10.00.....50&10&2%
Morth's.....list net @ 10%
Zimmerman's—See Fasteners Blind.

Ammunition—See *Caps, Cartridges, Shells, &c.*

Anvils—

Eagle Anvils, ₩ ℔ 9¢.....15@15&5%
Peter Wright's.....11@11½%
Armitage's Mouse Hole.....10½@11¢
Am. Wrought, Horse shoe brand.11@11½¢
Trenton.....10@10½¢
Wilkinson's.....10½@11¢
Moore & Barnes Mfg. Co.....33⅓%

Anvil Vise and Drill—

Millers Falls Co., $18.00.....20%
Cheney Anvil and Vise.....25%
Allen Anvil and Vise $3.00.....40&10%
Star.....45&5%

Apple Parers—See *Parers, Apple, &c.*

Augers and Bits—

Common Augers and Bits.....70@70&10%
Boring Machine Augers.....70@70&10%
Car Bits, 12-in. twist.....50%
Russell Jennings' Augers and Bits.25&10%
Jennings' Pattern Car Bits.....40%
Jennings' Pattern Auger Bits.....60%
Snell's Bits.....60&5%
C. E. Jennings & Co., No. 10, extension lip.....40%
C. E. Jennings & Co., No. 30.....60%
C. E Jennings & Co., Auger Bits, ₩ set, 82½ quarters, No. 5, $5; No. 30, $3.50.25%
Lewis' Patent Single twist.....45%
Pugh's Black.....30%
Pugh's Jennings Pattern.....30%
L'Hommedieu Car Bits.....15&10%
Forstner Pat. Auger Bits.....15%
Cincinnati Bell-Hangers' Bits.....30&10

Bit Stock Drills—

Morse Twist Drills.....50&10&5%
Standard.....50&10&5%
Cleveland.....50&10&5%
Syracuse, for metal.....50&10%
Syracuse, for wood (wood list).30@30&5%
Cincinnati, for wood.....30&10%
Cincinnati, for metal.....45&10%

Expansive Bits—

Clark's small, $18; large, $26..35@35&10%
Ives' No. 4, ₩ doz. $60.....40%
Swan's.....40%
Steer's, No. 1, $26; No. 2, $18.....35@40%
Stearns' No. 2, $48.....20%

Gimlet Bits—

Common.....₩ gross $2.75@$3.25
Diamond.....₩ doz $1.25....40&10%
Bee.....25@25&5%
Double Cut, Shepardson's.....45@45&10%
Double Cut, Ct. Valley Mfg. Co....30&10%
Double Cut, Hartwell's, ₩ gro., $5.00..25%
Double Cut, Douglass'.....40&10%
Double Cut, Ives.....60@60&10%

Hollow Augers—

Ives', French, Swift & Co. (Beecher), Douglass'.....33⅓@33⅓ &10%
Bonney's Adjustable, ₩ doz $48.....50%
Stearns'.....20&10%
Ives' Expansive, each $4.50.....50&5%
Universal Expansive, each $4.50.....20%
Wood's.....25@25&10%
Cincinnati Adjustable.....25&10%
Cincinnati Standard.....25&10%

Ship Augers and Bits—

L'Hommedieu's.....15&10@15&10&5%
Watrous'.....25@25&10%
Snell's.....25@25&10%
Snell's Ship Auger Patt'n Car Bits, 15&10@15&10&5%

Awl Hafts—See *Hafts, Awl.*

Awls—

Awls, Sewing, Common....₩ gr. 85¢@90¢
Awls, Should. Peg.....₩ gr. $1.50@$1.55
Awls, Pat. Peg.....₩ gr. 35¢@38¢
Awls, Shouldered Brad..₩ gr. $1.30@ 1.40
Awls, Handled Brad...₩ gr. $2.50@$3.00
Awls, Handled Scratch..₩ gr. $4.00@4.50
Awls, Socket Scratch..₩ doz. $1.10@$1.20

Awl and Tool Sets—See *Sets, Awl and Tool.*

Axes—

	Plain.	Beveled.
First quality, best brands.	$7.00	$7.50
First qual., other brands	6.50 to 6.75	7.00
Second quality	5.50	6.00

Axle Grease—See *Grease, Axle.*

Axles—

No. 1....3¼¢@4¼¢, No. 2, 5¢@6¢
Nos. 7 to 14.....60&10%
Nos. 15 to 18.....47½%
Nos. 19 to 22.....70%
Concord Axles, loose collar.....4½¢@6¢
Concord Axles, solid collar.....5½¢@7¢
National Tubular Self Oiling..... 33⅓%@33⅓&5% } 3% cash

Bag Holders—See *Holders, Bag.*

Balances—

Spring Balances.....40%

	No. 2000	20	30
Chatillon, ₩ doz.....	$0.80	0.95	1.75 net

Chatillon Straight Balances.....40%
Chatillon Circular Balances.....50&10%

Barb Wire.—See *Wire, Barb.*

Bars—

Crow—

Cast Steel.....₩ ℔ 3½¢
Iron, Steel Points.....₩ ℔ 3¢

Basins, Wash—

Standard Fiberware, No. 1, 10½-in., $1.80; 12-inch, $2.00; 13½-inch, $2.50; 15-inch, $3.00.

Beams, Scale—

Scale Beams, List Jan. 12, '82..50&10@50&10&5%
Chatillon's No. 1.....40%
Chatillon's No. 2.....50%
Custer's.....33⅓%

Beaters—

Egg—

Dover.....₩ doz $1.00@$1.20
Duplex (Standard Co.).....₩ doz $1.00
Dover (Standard Co.).....₩ doz $1.00
Duplex Extra Heavy (Standard Co.)..... ₩ doz. $3.50
Bryant's.....₩ gross $14.00
Double (H. & R. Mfg. Co.), ₩ gro., No. 0 $12.00; No. 1, $15.00; No. 2.....$36.00
Easy (H. & R. Mfg. Co.).....₩ gro $12.00
Triple (H. & R. Mfg. Co.).....₩ gro $16.50
Spiral.....₩ gro $4.25 @ $4.50
Improved Acme (H. & R. Mfg. Co.)..... ₩ gro. $9.00
Silver & Co.....₩ doz $5.50

Culinary—

Keystone, P. D. & Co., Each, No. 1, $1; No. 2, $2.....20%

Bells—

Cow—

Common Wrought.....60&10%
Western, Sargent's list.....70&10%
Kentucky, "Star".....20&10%
Kentucky, Sargent's list.....70&10%
Kentucky, Durham.....70&10%
Dodge, Genuine Kentucky.....70@70&10%
Texas Star.....50&10@50&10&5%

Door—

Gong, Abbe's.....33⅓&10%
Gong, Yankee.....45&10%
Gong, Barton's.....40&10@50%
Crank, Brooks'.....50&10&2%
Crank, Cone's.....10%
Crank, Connel's.....20&10%
Lever, Sargent's.....60&10%
Lever, Taylor's Bronzed or Plated....net
Lever, Taylor's Japanned.....25&10%
Lever, R. & E. Mfg. Co.'s..50&10&2%
Pull, Brook's.....50&10&2%

Electric—

Wollensak's.....20%
Bigelow & Dowse.....20%

Hand—

Light Brass.....70&10@70&10&5%
Extra Heavy.....70%
White.....70%
Silver Chime.....33⅓&10%
Globe Cone's Patent).....25&10@35%

Miscellaneous—

Call.....45@50%
Farm Bells.....₩ ℔ 3¢&3¼¢
Steel Alloy Church and School Bells..40%

Bellows—

Blacksmiths'.....60&10&5@60&10&10%
Molders'.....40&10@50%
Hand Bellows.....40&10@50%

Belting, Rubber—

Common Standard.....75@75&10%
Standard.....70&5@70&10%
Extra.....60&10@60&10&10%
N.Y.B.&P. Co., Carbon.....60@60&5%
N.Y.B.&P.Co., Diamond.....50@50&5%
N.Y.B.&P.Co., Para.....40@40&5%

Bench Stops—See *Stops, Bench*

Benders and Upsetters, Tire—

Stoddard's Lightning Tire Upsetters..15%
Detroit Perfected Tire Bender.....15%
Green River Tire Benders and Upsetters.....20%

Bits—

Auger, Gimlet, Bit Stock Drills, &c., see *Augers and Bits.*

Bit Holders—See *Holders.*

Blind Adjusters—See *Adjusters, Blind.*

Blind Fasteners—See *Fasteners, Blind.*

Blind Staples—See *Staples, Blind.*

Blocks—

Cleveland Block Co., Mal. Iron.50@50&10%
Moore's Novelty, Mal. Iron.....50%
Sure Grip Steel Tackle Blocks.....25%
See also *Machines, Hoisting.*

Bolts—

Carriage, Machine, &c.—

Com. list June 10, '84.....75&10&5@80%
Genuine Eagle, Norway, list Oct. '84.... 80&5@80&10%
Eagle, Norway, list Oct. '84 80&10@80&15
Phila. pattern, list Oct. 7, '84..... 80%
R.B.&W., old list.....70%
Machine, list Jan. 1, 1890.....80&10%
Bolt Ends, list Jan. 1, 1890.....80&10%

Door and Shutter—

Cast Iron Barrel, Square, &c.....70&10%
Cast Iron Shutter Bolts.....70&10%
Cast Iron Chain (Sargent's list)....65&10%
Ives' Patent Door Bolts..60&10@60&10&5%
Wrought Barrel.....70&10@75%
Wrought Square.....70&10@75%
Wr't Shutter, all Iron, Stanley's..... 60&10@60&10&10%
Wr't Shutter, Brass Knob.....50@50&5%
Wr't Shutter, Sargent's list.....60&10%
Wr't Sunk Flush, Sargent's list....60&10%
Wr't Sunk Flush, Stanley's list.50&10&5%
Wr't B. K. Flush, Common.....55&10%

Stove and Plow—

Stove.....60&10@60&10&5%
Plow.....60&10&50@60&10&10%
R. B. & W., Plow.....55%

Tire—

Common, list Feb. 28, '83.....65@65&5%
Port Chester Bolt and Nut Company:
Empire list Feb. 28, '83.....65%
Keystone, Philadel., list Oct. '84.....80%
Norway, Phila., list Oct. '84.....75%
American Screw Company
Norway, Phila., list Oct. 16, '84.....75%
Eagle, Phila., list Oct. 16, '84.....80%
Philadel., list Oct. 16, '84.....80%
Bay State, list Feb. 28, '83.....65%
R. B. & W., Philadel., list Oct. 16, '84...80%

Borers, Tap—

Common and Ring.....20&10%
Ives' Tap Borers.....33⅓&5%
Enterprise Mfg. Co.....20%
Clark's.....33⅓@35%

Borax—

Per ℔.....9½@10½¢

Boring Machines—See *Machines, Boring.*

Bow Pins—See *Pins, Bow.*

Boxes, Wagon—

Per ℔.....2¾¢

Boxes, Miter.

Spiker's Excelsior, 3 in. $7.50, 4 in $8.50, 5 in. $13.00, 6 in. $15.00.....20%

Braces—

American Bit Brace and Tool Co.,
Nos. 10, 12, 20.....60&10%
Nos. 11, 21, 24, 27.....70&10%
Nos. 22, 23, 25.....60&10&5%
Nos. 13, 26, 36, 37.....70&10&5
Amidon's,
Barker's Imp'd Plain.....75&10@80%
Barker's Imp. Nickeled.....65&10@70%
Ratchet.....75&10@80%
Eclipse Ratchet.....60%
Globe Jawed.....40@40&10%
Corner Brace.....40@40&10%
Universal, 8 in., $2.10; 10 in.....$2.25
Buffalo Ball.....$1.10@$1.15
Barber's.....50&10%
Saxton's,
Barker's Imp. Polished.....75&10@80%
Barker's Imp. Nickeled.....65&10@70%
Ratchet, Polished.....50&10@60%
Ratchet, Nickeled.....40&10@50%
Buffalo Ball.....net, $1.10@$1.15
Bartholomew's,
Nos. 25, 27 and 30.....50&10@60&5%
Nos. 117, 118, 119.....70@70&5%
Common Ball, American.....$1.00@$1.10
Fray's Genuine Spofford's...50&5@50&10%
Fray's Nos. 70 to 120, 81 to 123. 207 to 414 50&10%
Ives' New Haven Novelty.....70@70&5%
New Haven Ratchet.....60&5@60&10%
Barber Ratchet.....60&5@60&10%
Barber's.....60&5%
Spofford.....60&5@60&10%
P. S. & W. Co., Peck's Patent.....60%
Rose & Johnson.....50%
Davis Patent.....50&10%

Brackets—

Shelf, plain,
Regular, list.....65@70%
Sargent's list.....60&10@70&10%
Shelf, fancy,
Sargent's list.....70@70&10%
Other makes at a wide range of prices.
Bradley Shelf Brackets.....70&10%

Bright Wire Goods—See *Wire.*

Broilers—

Henis' Self-Basting.	Inch.....	9	10	9x11
	Per doz...	$4.50	5.50	6.50

New Haven.....50%
Wire Goods Co.....65&10%
Morgan Odorless.....₩ doz. $12, 50%
Queen City.....33⅓%

Buckets, Well—Galvanized—

Hill's.....₩ doz. 12 qt. $4.25; 14 qt. $5.25
Iron Clad.....₩ doz. 14 qt. $4.25@4.50
Helwig's Flat Iron Band.....$3.75
Helwig's Wired Top.....₩ doz $4.00

Bull Rings—See *Rings, Bull.*

Butcher's Cleavers—See *Cleavers Butchers.*

Brass—

Wrought Brass.....80@80&10%
Cast Brass, Tiebout's.....50%
Cast Brass, Fast.....33⅓&10%
Cast Brass, Loose Joint.....33⅓&10%

Cast Iron—

Fast Joint, Narrow.....50&10&5@60%
Fast Joint, Broad.....50&10@60%
Loose Joint, Loose Joint, Japanned, Loose Joint, Jap. with Acorns.., Parliament Butts, Mayer's Hinges, Loose Pin, Acorns, Loose Pin, Acorns, Japanned... Loose Pin, Acorns, Japanned, Plated Tips..... } 75@75 &10%

Wrought Steel—

Fast Joint, Narrow, Fast Joint, Lt. Narrow, Fast Joint, Broad, Loose Joint, Broad, Table Butts, Back Flaps, &c.... Inside Blind, Regular, Indide Blind, Light..... Loose Pin..... } List Jan. 2 1893. 40@40&10%
Bronzed Wrought Butts.....50@50&10%

Calipers—See *Compasses.*

Calks, Toe—

Gautier, One Prong, Blunt.....5½@5¢
Burke's One Prong, Blunt.....6½@6¢
Burke's, Two Prong, Blunt.....7½@7¢
Burke's, One Prong, Sharp.....6½@7¢

Can Openers—See *Openers, Can.*

Cans, Milk—

S. S. & Co.: 5-gal., $3.00; 8-gal., $4.40; 10-gal., $4.75 each.....40&10%

Caps—

Percussion—

Hicks & Goldmark's and Union Metallic Cartridge Co. ₩ 100
F. L. Waterproof, 1-10's.....35@37¢
E. B. Trimmed Edge, 1-10's.....47@50¢
E. B. Grnd. Edge, Cent. Fire, 1-10's, 47@50¢
Musket. Waterproof, 1-10's.....50@58¢
G. D.....27@30¢
S. B. Genuine Imported.....45¢
Eley's E. B.....56@58¢
Eley's D Waterproof, Central Fire..$1.60

Primers—

Berdan Primers, $1.00.....2%
B. L. Caps (Sturtevant Shells) $1.00.....2%
All other Primers, $1.20.....2%

Cards—

Watson's Cotton, Wool, Horse and File, list January 28, 1891.....25%

Carpet Stretchers—See *Stretchers, Carpet.*

Cartridges—

Rim Fire Cartridges.....50&5&2%
Rim Fire Military.....15&2%
Cent. Fire, Pistol and Rifle.....25&5&2%
Cent. Fire, Military and Sporting 15&5&2%
Blank Cartridges, except 22 and 32 cal., additional 10% to above discounts.
Blank Cartridges, 22 cal., $1.75.....2%
Blank Cartridges, 32 cal., $3.50.....2%
Primed Shells and Bullets.....15&5&2%
B. B. Caps, Round Ball, $1.75.....2%
B. B. Caps, Con. Ball, Swgd., $2.00.....2%

Carpet Sweepers—See *Sweepers, Carpet.*

Casters—

Bed, Plate, Shallow Socket... } Brass.....55@55&10% Others....60@60&10%
Deep Socket.....40&10%
Martin's Patent (Phœnix).45&10@50&10%
Tucker's Patent, low list.....45%
Payson's Anti-friction.....70@70&10%
Payson's Truck.....60@60&10%
Yale Casters, low list.....45%
Yale, Gem.....70%
Giant Truck Casters.....35%
Stationary Truck Casters.....50&10%
Socket Truck Casters.....50@50&10%
Gwinner's Common Sense.....45%
Gwinner's Hercules.....45%

Cattle Leaders—See *Leaders, Cattle.*

Cement—

Victor Elastic.....5 ℔ pails ₩ ℔ 5¢

Chain—

Trace, Wagon and Fancy Chains, List revised May, 1893.....60@60&10%
American Coil, in cask lots,

3-16	¼	5-16	⅜	7-16	½	⅝	¾
$7.00	5.30	4.45	3.80	3.65	3.50	3.40	3.35

Less than cask lots, add ½¢@½¢ ₩ ℔
German Coil, list July 12, 1892 60@60&10%
German Halter Chain, list July 12, 1892, 60@60&10%
Covert Halter.....60&2%
Cover tTraces.....35&2%
Cover tHeel Chain.....50&2%
Galvanized Pump Chain.
5 ton lots.....₩ 100 ℔ $5.50
1-ton lots.....₩ 100 ℔ $5.75
500-℔ lots.....₩ 100 ℔ $6.75
Less than 500 ℔.....₩ 100 ℔ $7.00
Oneida Halter Chain.....60@60&5%
Jack Chain, Iron and Brass, list March 10, 1893.....60@60&10%
Barnes' Reinforced Sash.....60&10%
Barnes' Victor Sash.....65%

Chalk—

White, case lots. ₩ gr 50¢; small lots.55¢
Red, case lots....₩ gr 67¢ small lots.75¢
Blue, case lots....₩ gr 75¢; small lots 90¢
See also Crayons

Chalk Lines—See *Lines.*

Checks, Door—
Unity 50%

Chisels—

Socket Framing and Firmer
P. S. & W. ..... 75&10@75&10&10%
New Haven ..... 75&10@75&10&10%
Witherby ..... 75&10@75&10&10%
Mix ..... 75&10@75&10&10%
Ohio Tool Co. ..... 75&10@75&10&10%
Douglass ..... 75@75&5%
Buck Bros. 30%
Merrill ..... 60&10@60&10&5%
L. & I. J. White ..... 30@30&5%

Tanged and Miscellaneous.
Tanged Firmers ..... 50@50&10%
Butchers' ..... $4.75@$5.00
Spear & Jackson's ..... $5 to £
Buck Bros. 30%
Cold Chisels, ₩ lb. ..... 15@16¢

Chucks—
Beach Pat. ..... each, $8.00 ..... 20%
Morse's Adjustable, each, $7.00, 20@20&5%
Danbury ..... each, $6.00, 30@30&5%
Syracuse, Balz Pat. 25%
Graham Patent 33⅓%
Skinner's Patent Chucks.
Combination Lathe Chucks 33⅓%
Universal Lathe Chucks 40%
Independent Lathe Chucks 40%
Drill Chucks 15%
Union Mfg. Co.
Victor $8.50, 25%
Combination 40%
Universal 40%
Independent 40%

Churns—
Tinn Union, each, 5 gal. $3.25; 7 gal., $3.75; 10 gal., $4.25.
McDermaid Star Barrel Churn, each 6 gal., $2.60; 10 gal., $2.75; 15 gal., $3.00; 20 gal., $3.25.

Clamps—
S. I. Tool Co.'s Wrought Iron 25%
Adjustable, Cincinnati ..... 15&10%
Adjustable, Hammers ..... 15@15&5%
Adjustable, Stearn's ..... 30@30&10%
Stearn's Adjustable Cabinet and Corner ..... 30@30&10%
Cabinet, Sargent's ..... 70&10%
Carriage Makers', Sargent's ..... 75@75&5%
Carriage Makers', P., S. & W Co.. 40&10%
Eberhard Mfg. Co. ..... 40&5@40&10%
Warner's ..... 40&10@40&10&5%
Saw Clamps, see Vises, Saw Filers'.
Carpenter's, Cincinnati ..... 25&10%
Barnes' Machinists' Clamps. 33⅓%

Cleavers, Butchers'—
Bradley's ..... 25@30%
L. & I. J. White ..... 20&5%
Beatty's ..... 40@40&5%
New Haven Edge Tool Co.'s 40%
P., S. & W ..... 33⅓&5@33⅓&10%
Foster Bros. 30%
Schulte, Lohoff & Co. ..... 40@40&5%

Clips—
Norway, Axle, ¼ & 5-16 ..... 55&5&5%
2d grade Norway Axle, ¼ & 5-16.... 65&5%
Superior Axle Clips ..... 66⅔&5@70%
Norway Spring Bar Clips, 5-16.. 60&5&5%
Wrought Iron Felloe Clips ..... ₩ lb., 5½¢
Steel Felloe Clips ..... ₩ lb., 5¢
Baker Axle Clips 25%

Cloth and Netting, Wire
—See *Wire, &c.*

Cockeyes 50%

Cocks Brass—
Hardware list ..... 60&2%

Coffee Mills—See *Mills, Coffee.*

Collars, Dog—
Chapman Mfg. Company, new list.... 40%
Medford Fancy Goods Co. .... 40&10@50%
Embossed, Gilt, Pope & Steven's list, 30&10%
Leather, Pope & Steven's list 40%
Brass, Pope & Steven's list 40%

Combs, Curry—
Fitch's ..... 50&10@50&10&10%
Rubber, per doz., $10.00 ..... 25%
American Curry Comb Co. ..... 33⅓@40%
Kohler's Magic Oscillating.. ₩ doz., $2.00
Kohler's Humane ..... ₩ doz., $1.75

Compasses, Dividers, &c.
Compasses, Calipers, Dividers. 70@70&10%
Bemis & Call Co.'s
Dividers 65%
Compasses ..... 50&5%
Calipers, Inside or Outside 65%
Calipers, Wing 60%
Calipers, Double 65%
Calipers, Call's Patent Inside 65%
Excelsior 50%
J. Stevens & Co.'s ..... 25&10%
Starrett's
Spring Calipers and Dividers.... 25&10%
Lock Calipers and Dividers 25%
Combination Dividers 25%

Coolers, Water—
S. S. & Co.: 2-gal., $2.00; 3-gal., $2.50; 4-gal., $2.75; 6-gal., $3.40 each.... 33⅓%

Coopers' Tools—
See *Tools, Coopers'.*

Cord—

Sash—
Common ..... ₩ lb., 9@10¢
Patent, good quality ..... ₩ lb., 11@12¢
White Cotton Braided, fair... ₩ lb., 24@25¢
Common Russia Sash ..... ₩ lb., 12½@13¢
Patent Russia Sash ..... ₩ lb., 13½@ 14¢
Cable Laid Italian Sash ..... ₩ lb., 19@20¢
India Cable Laid Sash ..... ₩ lb., 11½@12¢
Silver Lake—
A quality, White, 50¢ 25%
A quality, Drab, 55¢ 25%
B quality, White, 30¢ 10%
B quality, Drab, 35¢ 10%
Sylvan Spring, Extra Braided, White. 34¢
Sylvan Spring, Extra Braided, Drab.. 30¢
Semper Idem, Braided, White.... 27@28¢
Egyptian, India Hemp, Braided ..... 26¢
Massachusetts, White ..... 29¢
Samson—
Braided, White Cotton ..... ₩ lb., 37¢
Braided, Drab Cotton ..... ₩ lb., 42¢
Braided, Italian Hemp ..... ₩ lb., 40¢
Braided, Linen ..... ₩ lb., 56¢
Tate's Solid Braided—
Hercules, White ..... ₩ lb., 25¢
Hercules, Drab ..... ₩ lb., 30¢
Economy, Drab ..... ₩ lb., 27¢
Economy, White ..... ₩ lb., 22¢
Onawan Mills—
Braided, Giant, Whit ₩ lb., 30¢.... 20%
Braided, Giant, Drab and Fancy, ₩ lb. 35¢ 10%
Braided, Crown White, ₩ lb., 50¢... 50%
Braided, Crown Drab and Fancy, ₩ lb. 5¢ 30%

Wire Picture—
Braided or Twisted ..... 80&5@80&15%

Corkscrews—See *Screws, Cork.*

Corn Knives and Cutters
—See *Knives, Corn.*

Crackers Nut—
Table (H. & B. Mfg. Co) 40%
Blake's Pattern, ₩ doz., $2.00 ..... 10%
Turner & Seymour Mfg. Co. 50%
Acme.
Japanned, ₩ gro., $30 ..... 50%
Nickel Plated, ₩ gro. $30 ..... 10%

Cradles—
Grain ..... 50&2@50&5&2%

Crayons—
White Crayons, ₩ gross ..... 7@8¢
D. M. Stewart Mfg. Co.:
Metal Workers', ₩ gross, $1.75 ..... 25%
Rolling Mill, ₩ gross, 2.50 ..... 25%
Railroad, ₩ gross, 2.00 ..... 25%
Soapstone Pencils, ₩ gross, 1.00 ..... 25%
See also *Chalk.*

Creamery Pails—See *Pails, Creamery.*

Crow Bars—See *Bars, Crow.*

Curry Combs—
See *Combs, Curry.*

Curtain Pins—
See *Pins, Curtain.*

Cutters—

Meat—
Dixon's, ₩ doz. ..... 40@10&5%

Nos.	1	2	3	4
	$14.00	$17.00	$19.00	$30.00

Woodruff's, ₩ doz. ..... 40@10&5%

Nos.	100	150
	$15.00	$18.00

Hale's, ₩ doz. 70%

Nos.	11	12	13
	$27.00	$33.00	$45.00

American 30%

Nos.	1	2	3	4	B	5
Each	$5	$7	$10	$25	$50	$60

Enterprise 25%

Nos.	10	12	22	32	42
Each	$3	$2.50	$4	$6	$15

Little Giant, ₩ doz. ..... 40&10@50%

Nos.	305	310	312	320	322
	$35.00	$18.00	$14.00	$72.00	$68.00

Triumph No. 505, ₩ doz., $21.00.. 25@30%
Miles' Challenge, ₩ doz. ..... 45@40&10%

Nos.	1	2	3
	$22.00	$30.00	$40.00

Home No. 1, ₩ doz., $26.00 ..... 55&10%
Draw Cut, each:

Nos.	5	2	6	8
	$50	$75	$80	$225

..... 20@25%
Beef Shavers (Enterprise) 20%
Chadborn's Smoked Beef Cutter, ₩ doz., $66.00

Slaw and Kraut—
Tucker & Dorsey Mfg. Co.:
Slaw Cutters, 1 Knife. ₩ gross... $21.00
Slaw Cutters, 2 Knife, ₩ gross... 30.00
Kraut Cutters 40%

Tobacco—
Champion ..... 20&10@30%
All Iron ..... ₩ doz., $4.25
Nashua Lock Co.'s.. ₩ doz., $18.00, 50@55%
Wilson's 55%
Sargent's ..... ₩ doz., $24.00, 55&10
Acme ..... ₩ doz., $20.00, 40%

Washer—
Smith's Pat.... ₩ doz., $12.00, 20&10&10%
Johnson's ..... ₩ doz., $11.00, 33⅓%
Penny's.. ₩ doz.,, Pol. $14; Jap'd, $16, 55%
Appleton's ..... ₩ doz., $16.00, 60&10%
Bonney's ..... 30&10%
Cincinnati ..... 25&10%

Diggers, Post Hole, &c.—

Samson, ₩ doz., $34.00 ..... 25@25&10%
Fletcher Post Hole Augers, ₩ doz., $36.00, 20@20&10%
Eureka Diggers ..... ₩ doz. $12.00@$13.00
Vaughan's Post Hole Auger, ₩ doz., $8.50@$9.50
Kohler's Little Giant ..... ₩ doz., $18.00
Kohler's Hercules ..... ₩ doz., $14.00
Kohler's Invincible ..... ₩ doz., $12.00
Kohler's New Champion.... ₩ doz., $8.00
Scheidler ..... ₩ doz., $18.00
Cronk's Post Bars, ₩ doz., $60.00, 50&5@50&10%
Gibb's Post Hole Digger.... ₩ doz., $15.00
Gibbs' National ..... ₩ doz., $12.00
Gibbs' Columbia ..... ₩ doz., $13.00
Gibbs' Imperial ..... ₩ doz., $7.50
Shimer's Hollow Handle.. ₩ doz., $24.00, 50%

Dividers—See *Compasses.*

Dog Collars—See *Collars, Dog.*

Door Checks—
See *Checks, Door.*

Door Springs—
See *Springs, Door.*

Drawers.
Money, ₩ doz. ..... $18@$20
Waddel's Improved, ₩ doz. $15.00

Drawing Knives—
See *Knives, Drawing.*

Drills and Drill Stocks—
Blacksmiths' ..... each $1.75
Blacksmiths' Self-Feeding, each $7.50, 20%
Ereast, P. S. & W ..... 40&10%
Breast, Wilson's ..... 30&5%
Breast, Millers Falls ..... each $3.00, 25%
Breast, Bartholomew's ..... each $2.50 25&10@40%
Ratchet, Merrill's ..... 20@20&5%
Ratchet, Ingersoll's 25%
Ratchet, Parker's ..... 20@20&5%
Ratchet, Whitney's ..... 20&10%
Ratchet, Weston's ..... 20@25%
Ratchet, Moore's Triple Action.... 25@30%
Ratchet, Curtis & Curtis 30%
Whitneys Hand Drill, Plain, $11.00; Adjustable, $12.00 ..... 20&10%
Automatic Boring Tools ..... $1.75@$1.85
Chicopee Automatic Drill ..... 20&10%
Goodell Automatic Drills ..... 40&5%

Twist Drills—
Cleveland ..... 50&10&10%
Diamond, W. & B ..... 50&10&10%
Graham's Pat. Groove Shank. 50&10&10%
Morse ..... 50&10&10%
New Process ..... 50&10&10%
Standard ..... 60&10&10%
Syracuse (Metal list) ..... 50&10%

Drill Bits or Bit Stock Drills—See *Augers and Bits.*

Drill Chucks—See *Chucks.*

Dripping Pans—
See *Pans, Dripping.*

Drivers, Screw—
Douglass Mfg. Co. ..... 20@20&10%
Disston's 50%
Buck Bros. 30%
Stanley R. & L. Co.'s
No. 64, Varnished Handles ..... 65&10%
No. 86 ..... 70&10%
Sargent & Co.'s
No. 1, Forged Blade ..... 60&10&10%
Nos. 20, 40 and 60 ..... 66⅔&10&10%
P. S. & W 70%
Knapp & Cowles
No. 1 ..... 60&20@70%
No. 2 ..... 60&10&10@70&5%
No. 3 ..... 60&5@60&10%
Nos. 4 and 00, Acme and Ideal.. 50&5@50&10&5%
Stearns' ..... 25&10&5%
Gay & Parsons 35%
Champion ..... 25&10%
Clark's Pat ..... 30@33⅓%
Ellrich's Socket and Ratchet.. 25@25&10%
Allard's Spiral, new list 25%
Kolb's Common Sense.. ₩ doz., $6.00, 25&10%
Syracuse Screw-Driver Bits ..... 30&30&5%
Screw Driver Bits ..... ₩ doz., 50@75¢
Screw Driver Bits, Parr's.. ₩ gross, $6.25
Fray's Hol. H dle Sets... No. 3, $12.00, 45% Cincinnati ..... 25&10%
Brace Screw Drivers ..... 25&10%
Buck Bros.' Screw Driver Bits.... 27½&5%
Goodell's Automatic 50%
Mayhew's Black Handle 50%
Mayhew's Monarch ..... 45&10%
C. T. Williamson Wire Novelty Co. 50%

Egg Beaters—See *Beaters, Egg*

Egg Poachers—
See *Poachers, Egg.*

Electric Bell Sets—
See *Bells, Electric.*

Emery—No. 4 to No. 54 to Flour, CF.

	46 gr.	150 gr.	F.FF.
Kegs, ₩ lb.	4½¢	5 ¢	2½¢
½ kegs, ₩ lb...	4¾¢	5¼¢	2¾¢
¼ kegs, ₩ lb...	5 ¢	5¾¢	3 ¢
10-₩ cans, 10 in case	6 ¢	6½¢	5 ¢
10-lb cans, less than 10	10 ¢	10 ¢	7½¢

Enameled and Tinned Ware—See *Ware, Hollow*

Escutcheon Pins—
See *Pins, Escutcheon.*

Escutcheons—
Door Lock.... Same dis. as Door Locks.
Brass Thread ..... 60@60&10%
Wood 25%

Expanded Metal—
List No. 5.
Lathing 10%
Fencing, Painted Sheets 20%
Netting, Painted Sheets 20%
Door Mats, Galvanized 25%
Window Guards, Paneled 15%
Tree Guards, Paneled 15%

Extractors, Lemon Juice
—See *Squeezers, Lemon.*

Fasteners, Blind—

Mackrell's, ₩ doz., $1.00 ..... 20@20&10%
Van Sand's Screw Pat, $15 ₩ gr.. 60&10%
Van Sand's Old Pat., $15 ₩ gr.... 55&10%
Austin & Eddy No. 2008 ..... ₩ gr., $9.00
Security Gravity ..... ₩ gr., $9.00
Zimmerman's ..... 50&10%

Faucets—
Fenn's 40%
Fenn's Cork Stops 33⅓%
Star 60%
Frary's Pat. Petroleum 60%
B. & L. B. Co.
West's Lock, Open and Shut Key.. 50%
Star, Metal Plug, new list 40%
Lockport, Metal Plug, reduced list.. 60%
Metallic Key, Leather Lined... 60&10@60&10%
Cork Lined ..... 70&5@70&10%
Burnside's Red Cedar 50%
Burnside's Red Cedar, bbl. lots.... 50&10%
John Sommers'
Peerless Best Block Tin Key 40%
IXL, 1st quality, Cork Lined 50%
Diamond Lock 40%
Perfection, Fla. Red Cedar (in boxes) 40%
Boss Metallic Key 50%
Reliable Cork Lined 60%
O. K. Western Pattern Cork Lined.. 50%
No Brand, Red Cedar (in bbls.).. 50&10%
Western Pattern Metal Key 40%
No Brand Metal Key 60%
Self Measuring
Enterprise, ₩ doz., $36.00 ..... 20%
Lane's ₩ doz., $36.00 ..... 25&10%

Felloe Plates—
See *Plates, Felloe.*

Fibre Ware—See *Ware, Fibre.*

Fifth Wheels—
Derby and Cincinnati ..... 45&5%
Brewster ..... 50&5%

Files—

Domestic—
Nicholson Files, Rasps, &c. 60&10&5@60&10&10%
Nicholson (X.F.) Files 25%
Nicholson's Royal Files (Seconds).... 75% (extra prices on certain sizes.)
American ..... 66⅔&10@66⅔&10&5%
G. & H. Barnett (Black Diamond) 60&10@60&10&5%
Arcade ..... 60&10&10@70%
Eagle ..... 60&10&10@70%
Other makers, best brands..60&10&5@70%
Fair brands ..... 70&10@70&10&10%
Second quality ..... 80@80&5%
Heller's Horse Rasps ..... 50@75@50&10%
McCaffrey's Horse Rasps ..... 50&10%
Chelsea Horse Rasps, Hand Cut.. 50&10%
Arcade Horse Rasps.... 60&10@60&10&5%
Trojan Horse Rasps ..... 60&10&5%

Imported—
Butcher ..... Butcher's list, 20%
Stubs ..... Stub's list 30%

Fixtures Grindstone—
Sargent's Patent ..... 70&10%
Reading Hardware Co. ..... 30&10%
P., S. & W. Co. ..... 50&10%
Moore's 55%

Fluting Machines—
See *Machines, Fluting.*

Fluting Scissors—
See *Scissors, Fluting.*

Fodder Squeezers—
See *Squeezers, Fodder.*

Forks—
Hay, Manure, &c. Asso. List, 70@70&5&2%
Hay, Manure, &c., Phila. List, 60@60&10&2%
Plated, see Spoons.

Frames—

Saw—
White Vermont ..... ₩ gro., $9.00@$10.00
Red, Polished and Varnished.... ₩ doz., $1.50, 25%

Screen, Window and Door—
Porter's Pat. Window and Door Frame, 33⅓&10%
Warner's Screen Corner Irons... 33⅓@ 33⅓&10%
Stearns' Frames and Corners. 25@25&10%
Cortland ..... 40@40&5
Phillips' Window Screen Frames..... 50@50&5%
Bonanza Window Screens.. 50&5@50&10%
Empire Fancy Screen Doors, ₩ doz .. $12

Freezers Ice Cream—
White Mountain ..... 60@60&5%
Granite State ..... 65@65&5%
Arctic ..... 70@70&5%
American 60%
Buffalo Champion ..... 65@65&5%
Shepard's Lightning ..... 65@65&5%
Gem 65%
Blizzard 70%
Double Action Crown 60%
Crown 60%
Star 60%
Peerless ..... 60&10%
Giant 60%
Zero 70%
Boss and Pet ..... 60&10&10&10%
Keystone, P., D. & Co., each, $1.50.... 20%
Standard ..... 60@60&5%
Standard Double Action ..... 60@60&5%
Expert ..... 65@65&5%
Model ..... 60@60&5%
Confectioners' Machine 50%

Fruit and Jelly Presses—
See *Presses, Fruit and Jelly.*

Fruit Pickers—
See *Pickers, Fruit.*

Fry Pans—See *Pans, Fry.*

Funnels—
Gersdorff's Perfection, Standard and Globe; *Tin*, 1 gro., 10%; 2 to 5 gro., 20%; 5 to 10 gro. 30%
Copper, 1 to 6 doz., 15%; 6 to 12 doz., 20%; over 12 doz. 25%

Furnaces, Soldering—
Burgess No. 3 Gem tin reservoir.... $7.00
Burgess No. 3 Gem, Copper reservoir. $8.50
Clayton & Lambert No. 1 Fire-Pot, complete $6.00

Fuse—Dis. 12½@15%. ₩ 1000 ft.
Common Hemp Fuse, for dry ground. $2.70
Common Cotton Fuse, for dry ground 2.85
Single Taped Fuse, for wet ground.. 3.85
Double Taped Fuse, for very wet gr.. 4.80
Triple Taped Fuse, for very wet gr.. 5.60
Small Gutta Percha Fuse, for water. 7.50
Large Gutta Percha Fuse, for water. 12.00

Gates Molasses—

Stebbin's Pattern ..... 80@80&5%
Stebbin's Genuine ..... 60&10&10%
Stebbin's Tinned Ends ..... 40&10%
Lincoln's Pattern ..... 70@70&10%
Weed's ..... 20&10%
Boss, ₩ doz.:
No. 1, $7; No. 2, $8; No. 3, $9; No. 4, $10 ..... 60&10&10%

Gauges—
Marking, Mortise, &c. ..... 60&10%
Starrett's Surface, Center and Scratch. 25&10%
Stanley R. & L. Co.'s Butt and Rabbet Gauge ..... 20&10%
Barrett's Comb. Roller Gauge ..... ₩ doz $8.00@$8.50
Hoague & Peck's Champion Gauge—
With Scale ..... ₩ doz., $5.00
Without Scale ..... ₩ doz., $4.00
Wire, Wheeler, Madden & Co. 10%
Wire, Morse's 25%
Wire, Brown & Sharpe's ..... 10@20%
Wire, P., S. & W. Co. ..... 10&10%

Gimlets—
Nail and Spike ..... 50&10&5%
Eureka Gimlets ..... 60&10%
Diamond Gimlets ..... ₩ gr $5.00
Double Cut, Shepardson's.... 45@45&5%
Doub e Cut, Ives' ..... 60@60&5%
Double Cut, Douglass' ..... 40&10%

Glue—
Le Page's Liquid ..... 25@25&5%
Upton's Liquid 35%
Improved Process ..... 25@25&5%
Dodd's Liquid Glue ..... 25@25&5%

Glue Pots—See *Pots, Glue.*

Grease, Axle—
Fraser's ..... Keg ₩ lb 4¢, Pail ₩ lb 5¢
Fraser's, in boxes ..... ₩ gr $9.50
Dixon's Everlasting, in bxs.. ₩ doz 1 lb $1.20; 2 lb $2.00
Dixon's Everlasting.... 10-lb pails, ea. 85¢
Lower grades, special brands, ₩ gr $5.50@$7.00
Axleine, tin boxes ..... ₩ gross $12.00
English Coach, wooden boxes ..... ₩ gross $3.50
English Coach, 5-lb tin pails. ₩ doz. $3.50
Tiger, wooden boxes ..... ₩ gross $7.00
Tiger, 5-lb tin pails ..... ₩ doz $2.85

Grindstones—
Family, regular list 60%
Family, Cleveland Stone Co. 30%

Grindstone Fixtures—
See *Fixtures, Grindstone.*

Gun Powder—See *Powder.*

Hack Saws—See *Saws.*

Hafts, Awl—
Sewing, Brass Fer. ₩ gr. $1 75
Pat. Sewing, Short. ₩ doz. ..... 45@50%
Pat. Sewing, Long ..... ₩ doz $1.20
Pat. Peg, Plain Top. ₩ doz. ..... 40@45%
Pat Peg, Leather Top. .. ₩ doz 60@

Halters—

Covert's, Rope, Jute.....60&10&10&2%
Covert's Rope, 7-16-in., Jute.....70&2%
Covert's Rope, ½-in., Hemp.....50&2%
Covert's Adj. Rope Halters.....40&2%
Covert's Hemp Horse and Cattle Tie.....50&10&2%
Covert's Jute Horse Ties.....70&2%
Covert's Jute Cattle Ties.....70&10&2%
Covert's Adj. Web Halters.....35&5&2%
Covert's Saddlery Works Halters...33⅓&%
Covert's Saddlery Works Horse and Cattle Ties.....33⅓&%
Covert's Saddlery Works Handy Web Halters.....33⅓&%

Hammers—

Handled Hammers—

Maydole's, list Dec. 1, '85.....25&10@35%
Buffalo Hammer Co.....
Humason & Beckley.....
Atha Tool Co.....
Verree.....
} ....50&10%
C. Hammond & Son.....40&10@—%
Fayette R. Plumb.
Artisans' Choice, A. E. Nail.....40&10%
Regular Y. & P., A. E. Nail.....50%
Horseshoe Turning Hammers.....50%
Other Hammers.....50&10%
Cheney's Claw.....40&10%
Cheney's Machinist's & Riveting...50&5%
Magnetic Tack, Nos. 1, 2, 3, $1.25, 1.50 & 1.75.....30&10%
Nelson Tool Works.....40&10%
Warner & Nobles, new list.....25&10
Peck, Stow & Wilcox.....35@40%
Sargent's.....40@40&10%

Heavy Hammers and Sledges—

3 ℔ and under...℔ ℔40¢
3 to 5 ℔.....℔ ℔36¢
Over 5 ℔.....℔ ℔30¢
} 75&10@75&10 &5%
Wilkinson's Smiths.....10½¢@11¢℔ ℔

Handcuffs and Leg Irons

—See *Police Goods.*

Handles—

Cross-Cut Saw Handles—

Atkins', new list.....40%
Champion.....15%
Ely's Perfection.....℔ doz., $3.00

Iron, Wrought or Cast—

Door or Thumb.

Nos.	0	1	2	3	4
Per doz.	$0.90	1.00	1.08	1.35	1.50

60&10&10%
Roggin's Latches.....℔ doz 30¢@35¢
Bronze Iron Drop Latches..℔ doz 70¢ net
Jap'd Store Door Handles—Nuts, $1.62; Plate, $1.10; no plate, $0.88.....net
Barn Door, ℔ doz $1.40.....10&10%
Chest and Lifting.....70@70&10%

Wood—

Saw and Plane.....40&10@50%
Hammer, Hatchet, Axe, &c.....40@40&5%
Brad Awl.....℔ gr $2.00
Hickory Firmer Chisel, ass'd.℔ gr 4.50
Hickory Firmer Chisel, large.℔ gr 5.00
Apple Firmer Chisel, ass'd...℔ gr 5.00
Apple Firmer Chisel, large...℔ gr 6.00
Socket Firmer Chisel, ass'd..℔ gr 3.00
Socket Framing Chisel, ass'd.℔ gr 5.00
J. B. Smith & Co.'s Pat File.....50&10%
File, assorted.....℔ gr 2.75
Auger, assorted.....℔ gr 5.00
Auger, large.....℔ gr 7.00
} 50%
Pat. Auger, Ives'.....30&10%
Pat. Auger, Douglass.....℔ set $1.25
Pat. Auger, Swan's.....℔ set $1.00
Hoe, Rake, Shovel, &c.....60@60&5%

Hangers—

Barn Door, old patterns.....70@70&5%
Barn Door, New England.....70@70&5%
Samson Steel Anti-Friction.....55%
Orleans Steel.....55%
Hamilton Wrought Steel Track.....55%
Champion.....60&10%
Climax Anti-Friction.....55%
Zenith for Wood Track.....55%
Sterling.....50&10@60%
Victor, No. 1, $15.00; No. 2, $16.50; No. 3, $18.00.....50&2%
Kidder's.....50@50&10%
Boss.....60&10@60&10&5%
Best Anti-Friction.....60&10@60&10&5%
Duplex (Wood Track).....60&10&5%
Terry's Modern.....50&10@50&10&5%
Terry's Ideal.....50&10@50&10&5%
Terry's Solid.....50&10@60%
Terry's Shield.....50&10@60%
Terry's Wrought Single Strap.....50&10%
Cronk's Patent, Steel Covered.....50&10%
Carrier Steel Anti-Friction.....50&10%
Richards'.....30@30&10%
Lane's New Standard.....50@50&5%
Lane's Standard.....50&5@50&10%
Lane's Parlor.....40%
Warner's Pat.....20&10&10%
Stearns' Anti-Friction.....20&10&10%
Stearns' Challenge.....25&10&10%
Cincinnati Nos. 1, $2.25; 3, $2.50; 4, $2.50.
Paragon, Nos. 5, 5¼, 7 and 8.....20&10%
Crescent.....60@60&10%
Nickel, Steel, Nos. 0, $25; 1, $20; 2, $15.....40&10@50%
Chicago Anti-Friction.....30&10%
Star.....40&10@40&10&5%
Barry.....50%
Interstate.....50&10@60%
Pendulum, Payson's.....40@40&10%
Moody.....45%
Economy, $6.00.....50&10%
Perfection.....50&10@50&10&5%
Lundy, Steel Parlor.....40%
Matchless.....50&10%
Magic.....45&10%
Wild West.....45&10%
Moore's Elevator.....33⅓%
Moore's Baggage Car Door.....33⅓%
Moore's Railroad.....55%

Harness Snaps—See *Snaps.*

Hatchets—

American Axe and Tool Co.
Blood's.....
Hunt's.....
Hurd's.....
Mann's.....
Peck's.....
Underhill's.....
Buffalo Hammer Co.....
Fayette R. Plumb.....
C. Hammond & Son.....
Kelly's.....
Sargent's & Co.....
P., S. & W. Co.....
Ten Eyck Edge Tool Co.....
} 40 & 10 @ 50&5%
Collins.....10%
Schulte, Lohoff & Co.....50&5@5%

Hay and Straw Knives—

See *Knives.*

Hinges—

Blind Hinges—

Parker.....75&2%
Huffer.....50%
Clark's, Nos. 1, 3, 5, 40 and 50..80@80&5%
Clark's Mortise Gravity.....50%
Sargent's, Nos. 1, 3, 5, 11, 12, 13.75@75&10%
Reading's Gravity.....75&10@75&10&5%
Shepard's.
Noiseless.....75&10%
Niagara.....80%
Buffalo.....80%
Clark's Genuine Pattern.....80%
O. S., Lull & Porter.....75&10%
Acme, Lull & Porter.....75%
Queen City Reversible...70&10&5@75%
Clark's, Lull & Porter, Nos. 0, 1, 1½, 2, 2½, 3.....75&10&2½%
North's Automatic Blind Fixtures, No. 2, for Wood, $9.00; No. 3, for Brick, $11.50.....10%

Gate Hinges—

Western.....℔ doz $4.20, 60@60&10%
N. E.....℔ doz $7.80, 60@60&10%
N. E. Reversible ℔ doz..$5.60, 60@60&10%
Clark's, Nos. 1, 2, 3.....60&10&5%
N. Y. State.....℔ doz $4.90,60@60&10%
Automatic.....℔ doz $12.50, 50%
Shepard's.....60&10&5%

Spring Hinges—

Geer's Spring and Blank Butts....40%
Union Spring Hinge Co.'s list, March, 1886.....20%
Barker's Double Acting.....25%
Union Mfg. Co.....25%
Bommer's.....30%
Buckman's.....15@20%
Chicago.....30%
Bardsley's Patent Checking.....15%
Acme.....30%
U. S.....25&10%
Empire and Crown.....20%
Hero and Monarch.....55%
American, Gem and Star.....20%
Oxford.....20%
Royal.....66⅔%
Reliable.....60%
Champion.....60%
} Extra 5@10% often given.
No. 10 Matchless.....60%
No. 25 Unbreakable.....60%
J. G. C. Covered, ℔ gro., $50.....50&5%
Samson.....60@60&7½%
Wiles', No. 1, ℔ gro., $16; No. 2.....$13
Devore, No. 1.....℔ gro., $13.00
Rex.....℔ gro., $13.00
Freeport.....℔ gro., $12.00
New Idea Nos. 1 and 10....℔ gross $13.00
New Idea Dbl. Acting.....45%
Ideal No. 3.....℔ gross $10.00
Stearns' Noiseless Floor Hinge, ℔ set, $5.00.....20&10@30%

Wrought Iron Hinges—

List February 14, 1891.
Strap and T.....50&10@50&10&5%
Corrugated Strap and T.....50&10&5%
Screw Hook and Strap.....
6 to 12 in., ℔ ℔.. 4¢
14 to 20 in., ℔ ℔..3½¢
22 to 36 in., ℔ ℔.. 3¢
Screw Hook and Eye....
½ in., ℔ ℔ 7½¢
⅝ in., ℔ ℔ 5½¢
¾ in., ℔ ℔ 4½¢
Rolled Blind Hinges, Nos. 32 and 34 50&10%
Rolled Blind Hinges, No. 232 and 234 55&10%
Rolled Plate.....70&10%
Rolled Raised.....70&10¢
Plate Hinges "Providence"
8, 10 & 12 in., ℔ ℔.....5¢
over 12 in. ℔ ℔.....4¢

Hoes—

Eye—

D. & H. Scovil.....20%
Lane's Crescent, Planters' Pattern.45&5%
Lane's Razor Blade, Scovil Pattern...30%
Maynard, S. & O. Pat.....45&5%
Sandusky Tool Co., S. & O. Pat
Am. Axe and Tool Co., S. & O. Pat.....
} 60&5 @60&10%
Chattanooga Tool Co., S. & O. Pat..60& 5@60&10%
Grub.....60&10%

Handled—

Garden, Mortar, &c.....70@70&5&2%
Planter's, Cotton, &c.....70@70&5&2%
Warren Hoe.....60@60&5%
Magic.....℔ doz $4.00

Hog Rings and Ringers—

See *Rings and Ringers—*

Hoisting Apparatus—

See *Machines, Hoisting.*

Hollow-Ware—

See *Ware, Hollow.*

Holders—

Bag—

Sprengle's Pat.....℔ doz $18....60%

Bit—

Extension.
Barber's, ℔ doz $15.00.....40@40&10%
Ives, ℔ doz $20.00.....60&5@60&10%
Diagonal.....℔ doz $24.00, 40%
Angular.....℔ doz $24.00, 40&5%

File and Tool—

Balz Pat.....℔ doz $4.00, 25%
Nicholson File Holders.....20%

Sash—

Motley's Adj. Sash, Medium Size.....℔ doz $1.20, 40%

Hooks—

Cast Iron—

Bird Cage, Sargent's List....
Bird Cage, Reading.....
Clothes Line, Sargent's list.
} 60&10&10%
Clothes Line' Moore's.....70%
Clothes Line, Reading list. 60&10@60&10&10%
Ceiling, Sargent's list.....55&10&10%
Harness, Reading list..55&10@55&10&10%
Coat and Hat, Sargent's list. 55&10@,60&10%
Coat and Hat, Reading. 50&10@50&10&10%
Coat and Hat, Moore's.....70%

Wrought Iron—

Cotton.....℔ doz $1.25
Cotton Pat. (N. Y. Mallet and Handle W'ks.....30%
Tassel and Picture, T. & S. Mfg. Co....50%
Wrought Staples Hooks, &c. See Wrought Goods

Wire—

Wire Coat and Hat, Gem, list April, 1886.....60@60&10
Wire Coat and Hat, Miles, list April, 1886.....50@50&10%
Indestructible Coat and Hat...45@45&5%
Wire Coat and Hat, Standard.60@60&10%
Handy Hat and Coat.....50&10@60%
Steady Ceiling Hooks.....50&10@60%
Belt.....80&10@80&20%
Atlas, Coat and Hat.....65%
Williamson's Bird Cage Hooks, List April, 1892.....40%
Bright Wire Goods—See Wire.

Miscellaneous—

Grass, No. 2, $2.00; No. 3, $2.10; No. 4, $2.25
Nolin's Grass.....℔ doz $2.25
Bush.....65@60%
Whiffletree—Patent.....65%
Hooks and Eyes—Malleable Iron. 70@70&10%
Hooks and Eyes—Brass.....60&10&10%
Fish Hooks, American.....50%
Bench Hooks—See Bench Stops.

Horse Nails—See *Nails, Horse*

Horse Shoes—

See *Shoes, Horse.*

Hose, Rubber—

Competition, Fair quality.....75@75&10%
Competition, Low Grade.....80@80&10
Standard.....70&10&70@10&5%
Extra.....60&10@60&10&10%
N. Y. B. & P. Co., Para.....25&5%
N. Y. B. & P. Co., Extra.....40&5@50%
N. Y. B. & P. Co., Dundee.....60@60&5%
Cotton Garden, ¾ in., coupled:
Fair Quality, ℔ ℔.....7¢
Good Quality, ℔ ℔.....8½¢

Huskers—

Blair's Adjustable.....℔ gr $8.00
Blair's Adjustable Clipper.....℔ gr 7.00
Hubbard's Solid Steel.....℔ gr 4.50

Indurated Fiber Ware—

See *Ware, Indurated Fiber.*

Irons.

Sad—

From 4 to 10, at factory....℔ 100 ℔, $2.30@$2.40
Self-Heating.....℔ doz $8.00
Self-Heating Tailors'.....℔ doz $18.00
Mrs. Potts' Sad Irons, per set:

No.	50	55	60	65
Small lots	.90	.85	1.05	.95

Crown.....60&10@60&10&5%
Ideal Irons, new list...50&10@50&10&10%
Salamander Irons.....25%
B. B. Sad Irons, ℔ ℔.....3@3¼¢
Chinese Laundry (N.E.Butt Co.).8¾¢, 15%
New England.....5¢, 20@20&5%
Mahony's Troy Pol. Irons.....25%
Sensible, list Jan. 91.....60&10&5%
Sensible Tailor's Irons.....33⅓%
National Self-Heating.....30%

Soldering—

Soldering Coppers.....℔ ℔ 19@21¢
Covert's Adjustable, list Jan. 1, 1886, 35&2%
Tinker's Dread..℔ doz $1.75; ℔ gro. $18

Pinking—

Pinking Irons, ℔ doz., 55@60¢.

Jack Screws—See *Screws.*

Jacks, Wagon—

Daisy.....33⅓%
Victor.....33⅓%
Lockport.....40%

Kettles—

Brass, Spun, Plain, list Jan. 1, '91..25&5%
Brass, Spun, Pld.W.M.list Jan. 1, '91..20%
Stamped Brass Kettles.....℔ ℔ 21¢
Enameled and Tea—See *Ware, Hollow.*

Keys—

Lock, Ass'n list Dec. 30, 1886..65&10@70%
Eagle, Cabinet, &c.....33⅓&2%
Hotchkiss' Brass Blanks.....40%
Hotchkiss' Copper and Tinned.....40%
Hotchkiss' Pad. and Cab.....35%
Wollensak Tinned.....50&10%

Knife Sharpeners—

See *Sharpeners, Knife.*

Knives—

Butcher, Shoe, &c.

Wilson's Butcher Knives, List Dec 8, 1890.....25%
Ames' Butcher Knives.....25%
Foster Bros.' Butcher, &c.....40%
Jordan's AA A1 Butchers', list.....net
Nichols' Butcher Knives.....40&10%
W. W. Wilson, Butcher, 6 in., $2.00; 7 in., $2.70; 8 in., $3.80, &c.
Ames' Shoe Knives.....20@25%
Ames' Bread Knives, ℔ doz $1.50, 15@20%
Moran's Shoe and Bread.....20@20&10%
Hay and Straw—See Hay Knives.
Table and Pocket—See Cutlery.

Corn—

Bradley's.....10%
Wadsworth's.....25@25&10%

Drawing—

Witherby.....
P., S. & W.....
Mix.....
New Haven.....
} ...75@75&10&5%
Merrill.....60&10@60&10&5%
Douglass.....75&75@5
Watrous.....15&10@25%
L. & I. J. White.....20&5%
Bradley's.....85%
Adjustable Handle.....25@33⅓%
Wilkinson's Folding.....25@25&5%

Hay and Straw—

Lightning, from jobbers....$8.00@$9.00
Wadsworth's.....40&7½@40&10%
Carter's Needle...℔ doz. $11.00@$11.50
Heath's.....℔ doz. $13.00@$13.50
Nolin's Hay.....℔ doz. $7.00@$8.00

Mincing—

Am. (2d quality), ℔ gr., 1 blade, $7
2 blades, $12; 3 blades, $18.....net
Lothrop's.....20&10%
Smith's, ℔ doz., Single, $2; Double $3 45@50%
Knapp & Cowles.....50&10@60%
Buffalo Adjustable....℔ doz. $3.00, 33⅓%

Knobs—

Door, Mineral.....60@65%
Door, Por. Jap'd.....70@75%
Door, Por. Nickel.....$2.00@$2.25
Door, Por. Plated Nicke..l....$2.00@$2.25
Drawer, Porcelain.....60&10@60&10&10%
Hemacite Door Knobs.....40&10&60%
Yale & Towne Wood, list Dec., 1885...40%
Base, Rubber Tip.....70&10&5%
Picture, Judd's.....60&10&10@70%
Picture, Sargent's.....70&10%
Picture, Hemacite.....35&5%
Shutter, Porcelain.....65&10%
Carriage, Jap.....℔ gro 80¢, 60&10%
Bardsley's Wood Door, Shutter, &c...15%

Ladders.

Davies Extension and Single.....20&5%

Ladies—

Melting, Sargents'.....60@60&5%
Melting, Reading.....35&10%
Melting, P., S. & W.....35&10@40%
Melting, Warner's.....80%

Lanterns—

Tubular—

Regular, with Guard.....℔ doz $3.50
O. K., with Guard.....℔ doz $3.75
Side Lift, with Guard.....℔ doz $4.00
Square Lift, with Guard.....℔ doz $4.25
Anti-Friction, with Guard...℔ doz $4.50
Brass Plated, Sq. Lift, Guard.℔ doz $5.50
Cop. Plated, Sq. Lift, Guard..℔ doz $5.50

Bull's Eye Police—

2¾-inch regular.....℔ doz $3.00
3-inch regular.....℔ doz $3.50
2¾-inch flash light.....℔ doz $4.00
3-inch flash light.....℔ doz $4.50

Lawn Mowers—

See *Mowers, Lawn.*

Leaders, Cattle—

Humason, Beckley & Co.'s.....70%
Sargent's.....70&10@70&10&10%
Hotchkiss.....30%
Peck, Stow & W. Co.....60&10%

Lemon Squeezers—

See *Squeezers, Lemon.*

Lifters, Transom—

Wollensak's:
Class 3 and 4, Bronzed Iron.....60%
Class 3 and 4, Bronze Metal.....50%
Class 3 and 4, Brass.....50%
Skylight Lifters.....35%
Reiher's, list Feb. 20, 1891
Bronzed Iron Rods.....60@60&10%
Brass, Real Bronze or Nickel Plate..30%
Excelsior.....50&10&2%
Shaw's.....50&10%
Payson's:
Universal.....60%
Solid Grip.....60&10@60&10&10%
Imperial.....50&10%

Lines—

Cotton and Linen Fish.....50%
Chalk.....60%
Masons' Linen, 84 ft., No. 1, $1.25; No. 2, $1.75; No. 3, $2.25; No. 4, $2.75; No. 5, $3.25.....25%
Cotton Chalk.....55%
Samson Cotton, No. 4, $2; No. 4½, $2.50; 10%
Silver Lake, Braided No. 0, $6.00; No. 1, $6.50; No. 2, $7.00; No. 3, $7.50 ℔ gro.....25%
Mason's Linen, No. 3½, $1.50; No. 4, $2.00; No 4½, $2.50.
Mason's Colored Cotton.....45%

Wire Clothes..	No. 18	19	20
100 ft.	$3.50	$3.00	$2.50

Ventilator Cord, Samson Braided, White or Drab Cotton..℔ doz $7.50..20%
Ossawan Mills, Chalk, Twisted, 60%; Chalk, Soft Braided, 50% Chalk, Braided, 25%.

Links, Open—

Terry's—per gro.:

Nos.	1	2	3	4
	$6.00	8.00	12.00	16.00

Locks, &c.—

Cabinet—

Eagle, Gaylord Parker and Corbin...
} List March, '84, rev. Jan. 1, '85.33⅓&2%
Deitz, Nos. 36 to 39.....40%
Deitz, Nos. 51 to 63.....40&10%
Deitz, Nos. 87 to 96.....40%
Champion Night Latches.....40%
Barnes Mfg. Co.....40@40&10%
Eagle and Corbin Trunk.....25&10
Champion Cab. and Combin.....33⅓%
Yale.....net prices
Romer's.....25

Door, Locks, Latches, &c.—

R. & E. Mfg. Co., list Mar.30, 1889.....
Mallory, Wheeler & Co., list July, '88.....
Sargent & Co., List Aug.1,'88
Branford Lock Works
} 65&10@70% Much lower net prices often made

Brittan, Graham & Mathes, list Jan. 1890.....60&10&10%
Plate.....33⅓&2%
Barnes Mfg. Co.....40@40&10%
Yale.....net prices
Delta Flat Key.....30%
Bomer's Night Latches.....15%
Brooklyn Latches.....50&10%
Warner's Burglar Proof, ₱ doz. $8.00, 50%

Elevator—

Moore's.....33⅓%

Padlocks—

List June 10, 1891.....50&2%
Norwich Lock Mfg. Co., old list.....50&2%
Yale Lock Mfg. Co.'s.....net prices
Eagle.....40%
Eureka, Eagle Lock Co.....40&2%
Bomer's Nos. 0 to 91.....30%
Bomer's Scandinavian, &c., Nos. 100 to 505.....15%
A. E. Deitz.....40%
Champion Padlocks.....40%
Hotchkiss.....30%
Star.....60%
Horseshoe.....₱ doz $9, 50@50&10%
Barnes Mfg. Co.....40@40&10%
Nock's.....30%
Scandinavian.....90&40%
E. T. Fraim's Keystone Scandinavian, Nos. 119, 120, 130 and 140.....90&10%
Other Nos.....65%
Ames Sword Co. up to No. 150.....40%
Ames Sword Co. above No. 150.....50%
Slaymaker, Barry & Co.
No. 1010 line.....90&5%
No. 41 line.....50%
No. 61 line.....60%
No. 21 line.....80%

Sash, &c.—

Clark's No. 1, $10; No. 2, $8 ₱ gr.....33⅓%
Ferguson's.....33⅓%
Victor.....60&10&2%
Walker's.....10%
Attwell Mfg. Co.....25&33⅓%
Reading.....66⅔&10@66⅔&10&10%
Hammond's Window Springs.....40%
Common Sense, Jap'd, Cop'd and Br'zed.....₱ gr $4.00
Common Sense, Nickel Plated. ₱ gr $10.00
Universal.....30%
Kempshall's Gravity.....60%
Kempshall's Model.....60@60&10%
Corbin's Daisy, list Feb. 15, 1886.....70%
Payson's Perfect.....60&10&10%
Hugunin's Sash Balances.....25&5&2%
Hugunin's New Sash Locks.....25&5&2%
Ives Patent.....60&10&5@60&10&10%
Fish (Liesche's pat.), No. 100, ₱ gr., $8; No. 105, ₱ gr., $10.....50%
Davis, Bronze, Barnes Mfg. Co.....60%
Champion Safety list January, 1893.70&5%
Security.....70%
Giant, list Jan., 1892.....70&5%
Wolcott's.....60&10&5%
Monarch.....50%

Lumber Tools—

See *Tools, Lumber.*

Lustro—

Four-ounce bottles.....₱ doz, $1.75; ₱ gross.....$17.00

Machines.

Boring—

	Without Augers.	Upright.	Angular.
Douglas	$5.50	$6.75	50%
Snell's, Rice's Pat.	5.50	6.75	40&10&10%
Jennings'	5.50	6.75	45&10%
Other Machines	2.35	2.75	
Phillips' Patent with Augur	7.00	7.50	
Miller's Falls	7.50		25%

Fluting—

Knox, 4¼-inch Rolls.....$3.25 each } 35%
Knox, 6-inch Rolls.....$3.60 each }
Eagle, 3½-inch Rolls, $2.15.....35%
Eagle, 6½-inch Rolls, $2.85.....35%
Crown, 4½ in., $3.50; 6 in., $4.00; 8 in., $6.50 each.....35%
Crown Jewel, 6 in.....$3.50 each, 35%
American, 5 in., $3.00; 6 in., $3.40; 7 in., $4.50 each.....35%
Domestic Fluter.....each, $1.50
Geneva Hand Fluter, White Metal, ₱ doz $12, 25%
Crown Hand Fluter, Nos. 1, $15.00; 2, $12.50; 3, $10.00; 4, $8.25.....30%
Shepard Hand Fluter, No. 85, per doz. $15.50.....40%
Shepard Hand Fluter, No. 110, ₱ doz $11.00.....40%
Shepard Hand Fluter No. 95, ₱ doz $8.00.....40%
Combined Fluter and Sad Iron. ₱ doz $15.00.....30%

Hoisting—

Moore's Hand Hoist, with Lock Brake.20%
Moore's Anti-Friction Differential Pulley Block.....20%
Moore's Rope Differential Pulley Block.....60%
Energy Mfg. Co.'s.....25%
See also *Blocks.*

Washing—

Anthony Wayne, ₱ dos, No. 1, $42; No. 2, $36; No. 3, $42.
Wayne American.....₱ doz $36.00
Western Star ₱ dos, No. 2, $36; No. 3 $39.
Weisell.....₱ doz $54.00
Fair and Square.....₱ doz $42.00

Mallets—

Hickory.....20&10@20&10&10%
Lignumvitæ.....20&10@20&10&10%
E. & L. Block Co., Hickory & L. V. 30@30&10

Mattocks—Regular list. 60&10@60&10&5%

Measures—

Standard Fiberware, No. 1, peck ₱ dozen, $3.50; ½-peck, $3.00

Meat Cutters—

See *Cutters, Meat.*

Menders, Harness—

Per doz.....$2.00

Milk Cans—See *Cans, Milk.*

Mills—

Coffee—

Box and Side, List, Jan. 1, 1888..60@60&5%
Net prices are often made which are lower than above discount.
American, Enterprise Mfg. Co., list Jan. 17, 1893.....20%
The Swift, Lane Bros.....30%
Waddell's New Box Mills, Ideal Brand, New List.....60%

Mincing Knives—

See *Knives, Mincing.*

Molasses Gates—

See *Gates, Molasses.*

Money Drawers—

See *Drawers, Money.*

Mowers, Lawn—

Best Machines: 10-in., $4; 12-in., $4.50; 14-in., $5; 16 in., $5.50; 18-in., $6.
Low-Grade Machines: 10-in. $3; 12-in., $3.25 14-in., $3.50 each

Muzzles—

Safety.....₱ doz, $3.00, 25%

Nails.—

Cut and Wire. See Trade Report.
Wire Nails, Papered.
Association list, May 1, '92.80&10&10&5%
Tack Mfrs.' list.....70&5@70&10%
Hungarian, Finishing, Upholsterers', &c. See *Tacks.*

Horse—

	Nos. 6	7	8	9	10	
American	9½	9½	9½	9½	9½	net
Ausable	28¢	26¢	25¢	24¢	23¢	40&5&2%
Clinton, Fin.	19¢	17¢	16¢	15¢	14¢	30&5%
Essex	28¢	26¢	25¢	24¢	23¢	40&10@50%
Lyra	19¢	17¢	16¢	15¢	14¢	40&5%
Snowden	19¢	17¢	16¢	15¢	14¢	40&5%
Vulcan	23¢	21¢	20¢	19¢	18¢	25%
Northwest'n.	25¢	23¢	22¢	21¢	20¢	25@25&5%
A. C.	25¢	23¢	22¢	21¢	21¢	25&10@33⅓&5%
C. B. K.	25¢	23¢	22¢	21¢	21¢	33⅓@33⅓&10%
Maud S.	25¢	23¢	22¢	21¢	21¢	40&10&5%
Champlain	28¢	26¢	25¢	24¢	23¢	40&5&5&2%
Saranac	23¢	21¢	20¢	19¢	18¢	40%
Champion	25¢	23¢	22¢	21¢	20¢	10&10&10%
Capewell	19¢	18¢	17¢	16¢	16¢	10&5%
Anchor	23¢	21¢	20¢	19¢	18¢	35%
Western	23¢	21¢	20¢	19¢	18¢	50%
Empire Bronzed					13@14	₱ D

Picture—

Brass Head, Sargent's list.....60@60&10%
Brass Head, Combination list.....50&10%
Porcelain Head, Sargent's list.50&10&10%
Porcelain Head, Combination list.40&10%
Niles' Patent.....40%

Nail Pullers—See *Pullers, Nail.*

Nail Sets—See *Sets, Nail.*

Nut Crackers—

See *Crackers, Nut.*

Nuts—List Dec. 18, 1889.

	Square.	Hex.
Hot Pressed	5.80¢	6.50¢ off list
Cold Punched	5.00¢	5.10¢ off list

In packages of 100 D, add 1-10¢ ₱ D, net; in packages less than 100 D, add ⅛¢ ₱ D, net.

Oakum—

Best or Government.....₱ D 6¾@7¼¢
U. S. Navy.....₱ D 5¾@6¢
Navy.....₱ D 5¢@5¼¢

Oil Tanks—See *Tanks, Oil.*

Oilers—

Zinc and Tin.....65&10@70&5%
Brass and Copper.....50&10@50&10&5%
Malleable, Hammers' Improved, No. 1, $3.60; No. 2, $4.00; No. 3, $4.40 ₱ doz. 10@10&5%
Malleable, Hammers' Old Pattern, same list.....45%
Prior's Pat. or "Paragon" Zinc. 60&10&10%
Prior's Pat. or "Paragon" Brass.....50%
Olmstead's Tin and Zinc.....60%
Olmstead's Brass and Copper.....50%
Broughton's Zinc.....60%
Broughton's Brass.....50%
Steel, Draper & Williams.....50%

Openers, Can—

Messenger's Comet.....₱ doz $3.00, 25%
American.....₱ gross $2.75@$3.00
Duplex.....₱ doz 25¢, 15@20%
Lyman's.....₱ doz $3.75, 20%
No. 4, French.....₱ doz $2.25, 55@60%
No. 5, Iron Handle.....₱ gr $6.00, 45@50%
Eureka.....₱ doz $2.50, 10%
Sardine Scissors.....₱ doz $2.75@3.00
Star.....₱ doz $2.75
Sprague, No. 1, $2.00; 2, $2.25; 3, $2.50; 66⅔@70%
Excelsior, No. 1 $2.50; No. 2, $1.50.....40%
World's Best ₱ gross, No. 1, $12.00; No. 2, $24.00; No. 3, $36.00.....50&10%
Universal, ₱ doz $3.00.....55&5%
Domestic, ₱ doz $2.00.....45%
Champion, ₱ doz $2.00.....50%
Moore's.....70%

Packing, Steam—

Rubber—

Standard.....70@70&10%
Extra.....60@60&5%
N. Y. B. & P. Co., Standard.....50%
N. Y. B. & P. Co., Empire.....60%
N. Y. B. & P. Co., Salamander.....25%
Jenkins' Standard, ₱ D 80¢.....25@25&5%

Miscellaneous—

American Packing.....10¢@11¢ ₱ D
Russia Packing.....14¢ ₱ D
Italian Packing.....13¢@14¢ ₱ D
Cotton Packing.....15¢@17¢ ₱ D
Tape.....7¢@8¢ ₱ D

Pails—

Creamery—

S. S. & C.: 18-qt., $7.00; 20-qt., $7.25 per doz.....5%

Galvanized—

	Quarts	10	12	14
Hill's Light Weight, ₱ doz.	$2.75	3.00	3.25	
Hill's Heavy Weight, ₱ dz.	3.00	3.25	3.75	
Helwig's	2.50	2.75	3.00	
Sidney Shepard & Co.	2.50	2.75	3.00	
Iron Clad	2.50	2.75	3.00	
Fire Buckets	2.75	3.25	3.50	

Buckets—See Well Buckets.

Indurated Fiber Ware—25%

Star Pails, 12 qt.....₱ doz $4.20
Milk, 14 qt.....₱ doz $5.40
Stable, 14 qu.....₱ doz $6.00
Fire Pails, deep.....₱ doz $4.80
Fire Pails, round bottom.....₱ doz $5.40

Standard Fiber Ware—

	Plain.	Decr'd
Water Pails, 12 qt., ₱ doz.	$3.60	$4.00
Dairy Pails, 14 qt., ₱ doz.	4.00	4.50
Fire Pails, No. 1, 12 qt., ₱ doz	4.00	
Fire Pails, No. 2, 14 qt., ₱ doz	4.50	
Sugar Pails	5.50	6.00
Horse Pails	4.50	
Buggy Pails	3.50	
Slop Jars (bal. trap)	7.50	8.50
Chamber Pails, 14 qt.	6.00	7.00

Pans—

Dripping—

Small sizes.....₱ D 5½¢
Large sizes.....₱ D 5¢
Silver & Co. (Covered).....40%

Fry—

Standard List:

No.	0	1	2	3	4
₱ doz.	$3.00	$3.75	$4.25	4.75	$5.25
No.	5	6	7	8	
₱ doz.	$6.00	$7.00	$8.00	$9.00	

Polished, regular goods.....75@75&10%
Acme Fry Pans.....66⅔%

Dust—

Steel Edge, No. 1.....₱ doz $1.75

Roasting and Baking—

Columbian, S. S. & Co.: Nos. 10, $2; 20, $2.25; 30, $2.50 each.....60&10%

Paper and Cloth—

Sand and Emery—

List April 19, 1886.... 50&10@50&10&10%
Sibley's Emery and Crocus Cloth.....30%

Parers—

Apple—

Advance.....₱ doz $4.75
Baldwin.....₱ doz 5.25
Bonanza.....each 5.00
Daisy.....₱ doz 4.00
Dandy.....each 7.50
Eclipse.....₱ doz 4.25
Eureka, 1888.....each 16.00
Family Bay State.....₱ doz 12.00
Favorite.....₱ doz 5.00
Gold Medal.....₱ doz 4.00
Ideal.....₱ doz 4.00
Improved Bay State....₱ doz 27.00@30.00
Little Star.....₱ doz 4.50
Monarch.....₱ doz 13.50
New Lightning.....₱ doz 5.50
Oriole.....₱ doz 4.00
Penn.....₱ doz 4.00
Perfection.....₱ doz 4.00
Pomona.....₱ doz 4.00
Rocking Table.....₱ doz 6.00
Turn Table.....₱ doz 4.50
Victor.....₱ doz 13.50
Waverly.....₱ doz 4.00
White Mountain.....₱ doz 4.00
72.....₱ doz 4.25
78.....₱ doz 7.00

Potato—

White Mountain.....₱ doz $4.50
Antrim Combination.....₱ doz $5.50
Hoosier.....₱ doz $13.50
Saratoga.....₱ doz $5.50

Pencils—

Faber's Carpenters'.....high list 50%
Faber's Round Gilt.....₱ gro $5.25
Dixon's Lead.....₱ gro $4.50
Dixon's Lumber.....₱ gro $6.75
Dixon's Carpenters'.....10%

Pencils, Soapstone—

See *Crayons.*

Pickers, Fruit—

Prize Fruit Pickers.....50%

Picks—

Railroad or Adze Eye, 5 to 6, $12.00; 6 to 7, $13.00.....60&10@60&10&10%

Picture Nails—

See *Nails, Picture.*

Pinking Irons—

See *Irons, Pinking.*

Pins—

Bow—

Humason, Beckley & Co.'s.....60&10%
Sargent & Co.'s, $17 and $18.....60&10%
Peck, Stow & W. Co....50&10&50&10&5%

Curtain—

Silvered Glass.....net
White Enamel.....net

Escutcheon—

Iron, list Nov. 11, 1885..50&10&50&10&5%
Brass.....60@60&5%

Pipe, Wrought Iron—

List April 13, 1893.

1¼ and under, Plain.....57½&10%
1¼ and under, Galv.....50&10%
1½ and over, Plain.....67½&10%
1½ and over, Galv.....57½&10%
Boiler Tubes, list Oct. 24, 1892.....65&10%
Casing, list Nov. 16, 1892.....52½&10%
Inserted Joints Casing, list Nov. 16, 1892.....47½&5%
Steel Boiler Tubes.....27½&5%
Cold Drawn Seamless Steel Tubing..50%

Planes and Plane Irons—

Wood Planes—

Molding.....40@40&10%
Bench, First quality.....45@45&10%
Bench, Second quality.....50@50&10%
Bailey's (Stanley R. & L. Co.) ..50&10%

Iron Planes—

Bailey's (Stanley R. & L. Co.).....50&10%
Miscellaneous Planes (Stanley R. & L. Co.).....25&10%
Steers' Iron Planes.....50@50&5%
Meriden Mal. Iron Co.'s.....50@50&5%
Davis' Iron Planes.....66@50&5%
Birmingham Plane Co.....60@60&5%
Gage Tool Co.'s Self-Setting...20&10&10%
Chaplin's Iron Planes.....50@50&5%
Sargent's.....60@60&10%
Standard Tool Co.....50@50&5%

Plane Irons—

Butcher's.....$5.00@$5.25 to
Buck Bros.....80,

Auburn Thistle, Ohio, Sandusky.....30&10%
L. & I. J. White.....25%
Stanley R. & L. Co.....50&10%

Plates—

Felloe.....₱ D 6¢@6¾¢

Pliers and Nippers—

Button's Patent.....60%
Hall's No. 2, 5 in., $13.50; No. 4, 7 in., $21.00 ₱ doz.....40%
Humason & Beckley Mfg. Co..50@50&10%
Lindsay's Giant.....33⅓%
Gas Pliers.....60%
Gas Pliers, Custar's Nickel Plated..60&5%
Eureka Pliers and Nippers.....40%
Russell's Parallel.....25%
P., S. & W. Cast Steel.....50%
P., S. & W. Tinners' Cutting Nippers, add 6%.....10%
Carew's Pat. Wire Cutters.....20%
Morrill's Parallel, ₱ doz, $12.00....30&5%
Cronk's 8 in., $15.00; 10 in.....$20
Cronk's Button Pattern.....50&10@60%
Cronk's Carrier Pliers.....60@60&5%

Plumbs and Levels—

Regular List.....75&10@75&10&5%
Stanley's Duplex.....20&10%
Stanley's Handy.....20&10%
Disston's.....50%
Cook's.....40&10%
Pocket Levels.....70&10@70&10&10%
Davis Iron Levels.....30%
Davis Inclinometers.....10&10%

Poachers, Egg—

Buffalo Steam Egg Poachers, ₱ dos, No. 1, $6.00; No. 2, $9.00.....33⅓%
Silver & Co., 6-Ring, ₱ dos, $4.00; 8-Ring.....$2.00

Pokes, Animal—

Bishop s I. X. L.....₱ doz $6.00
Bishop's Monarch.....₱ doz $4.50
Bishop's Pioneer.....₱ doz $4.00
Bishop's American.....₱ doz $3.00
Eagle, Double Stale.....₱ doz $5.75
Eagle, Single Stale.....₱ doz $3.75
Buckeye, Single Stale.....₱ doz $2.75
Bolding.....₱ doz $6.00
Metallic Horse Poke.....₱ doz., $6.00

Police Goods—

R. I. Tool Co., Handcuffs, $15.00 ₱ dos 10%
R. I. Tool Co., Leg Irons, $25.00 ₱ dos 10%
Tower's.....35%
Daley's Improved Handcuffs; 2 Hands, Polished, ₱ doz, $48.00; Nickeled, $57.00: 3 hands, Polished, ₱ dos, $72.00; Nickeled, $84.00.....25%
J. P. Lovell's Police Goods.....25%

Polish—

Metal—

Prestoline.....30%
Prestoline Paste.....33⅓%
Gaston's Silver Compound.....33⅓%

Stove—

Joseph Dixon's.....₱ gro, $6.00, 10%
Gem.....₱ gro, $4.50, 10%
Gold Medal.....₱ gro, $6.00, 25%
Lustro.....₱ gro, $4.75
Ruby.....₱ gro, $3.75
Rising Sun, 5 gro lots.....₱ gro $5.50
Dixon's Plumbago.....₱ D 8¢
Boynton's Noon Day.....₱ gro $13.00
Parlor Pride Stove Enamel, ₱ gro
Yates' Liquid, 2 gal ₱ gal...$0.80 3 gal .70 5 gal .60 10 gal .50
Yates Standard Paste Polish, 10 D cans, ₱ D 12½¢
Jet Black.....₱ gro $3.50
Japanese.....₱ gro $3.50
Fireside.....₱ gro $2.50
Diamond O. K. Enamel.....₱ gro $19.00
Bonnell's Liquid Stove Polish, ₱ gro $9.00
Bonnell's Paste Stove Polish, ₱ gro $6.00
Black Eagle Benzine Paste, 5 and 10 D cans.....12½¢
Black Jack Water Paste, 5 and 10 D cans.....12½¢
Nickel Plate Paste.....₱ gro $6.00
Crown Paste.....₱ gro $7.20
Crown Paste in 5 and 10 D pails, ₱ D 12¢
Black Flag.....₱ gro $7.20
Black Flag, 5 and 10 D pails.....₱ D 12¢
Black Flag, liquid, in bottles, ₱ gro $8.00
Diamond Rock Nickel Cleaner.....₱ gro $10.80
Raven Liquid, 6 oz. bottles.....₱ gro $8.00
Raven Liquid, 8 oz. bottles..₱ gro $9.00
Raven Water Polish, large boxes..₱ gro $7.20
Raven Paste (6 pails), ₱ D.....10¢

Poppers, Corn—

Round or Square,
1 qt.....₱ doz $1.00; ₱ gr $8.00
1½ qt.....₱ doz $1.00; ₱ gr $9.00
2 qt.....₱ doz $1.50; ₱ gr $14.00

Post Hole and Tree Augers and Diggers—

See *Diggers, Post Hole, &c.*

Potato Parers—

See *Parers, Potato.*

Pots—

Glue—

Tinned.....40&10@40&10&5%
Enameled.....40&10@40&10&5%
Family, Howe's "Eureka".....40%
Family, L. F. C.'s "Handy".....60%

Powder—

In Canisters—

Fine Sporting, 1 D each	0.90
Duck, 1 D each	.60
Rifle, 1 D each	.30
Rifle, ½ D each	.18

In Kegs—

Rifle, 25-D kegs	$3.50
Rifle, 12½-D kegs	2.00
Rifle, 6¼-D kegs	1.15
Duck, 25-D kegs	11.00
Duck, 12½-D kegs	5.75
Duck 6¼ D kegs	3.00

Presses—

Fruit and Jelly—

Enterprise Mfg. Co.....25%
Lenis.....₱ doz $3.50
Shepard's Queen City.....40%
Silver & Co.....₱ doz $2.75

Pruning Hooks and Shears—See *Shears.*

Pullers, Nail—
Scranton.. ....₩ doz., $18.00, 33⅓%
Giant, No. 1.....₩ doz., $18.00, 10%
Giant, No. 2.....₩ doz., $15.00, 10%
Pelican.....₩ doz., $9.00, 25%
Eclipse.....Each, $2.00, net
Economy.....₩ doz., $6.00

Pulleys—
Hot House, Awning, &c.....66⅔@70%
Japanned Screw.....60&10%10%
Brass Screw.....70%
Japanned Side.....60&10%10%
Moore's Side, Anti Friction.....50%
Moore's Ceiling or End, Anti-Friction 40%
Moore's Dumb Waiter, Anti-Friction 50%
Moore's Electric Light ... .33⅓%
Japanned Clothes Line.....60&10%
Hay Fork, Solid Eye, $4.00; Swivel, $4.50.....50&10@50&10&5%
Hay Fork, "Anti-Friction," 5 in. solid, $6.70.....50%
Hay Fork, "F" Common and Patent Bushed.....20%
Hay Fork, Tarbox Pat. Iron.....20%
Hay Fork, Reed's Self-Lubricating....60%
Hay Fork, Moore's Anti-Friction 5 in. Wheel, ₩ doz., $12.00.....40%
Shade Rack.....45%
Tackle Blocks—See Blocks.
Shepard's Niagara, No. 25..₩ doz 23¢ net
Dash (Auger Mortise).
Common Sense.....60%
Empire.....60%
Ideal, Nos. 2, 4, 10 & 15 } 30% less 1¢ ₩ doz net.
Acme.....
Star.....
On bbl. lots extra 5%.
Ideal, Nos. 25 and 55. ..₩ doz. 22¢ net.

Pumps—
Cistern, Best Makers..... .60@60&10%
Pitcher Spout, Best Makers.....67½@70%
Pitcher Spout, Cheaper G'ds..75@75&10%

Punches—
Saddler's or Drive, good..₩ doz., 60@65%
Bemis & Call Co.'s Cast Steel Drive.50&5%
Bemis & Call Co.'s Springfield Socket..65%
Spring, good quality..₩ doz., $2.50@$2.60
Spring, Leach's Pat 15%
Bemis & Call Co.'s Spring.....50&5%
Bemis & Call Co.'s Check.....55%
Solid Tinners', P., S. & W. Co., ₩ doz., $1.44.....55%
Tinners' Hollow Punches, P., S. & W. Co.....20&2%
Rice Hand Punches.....15%
Avery's Revolving.....40%
Avery's Sawset and Punch—See Sawsets
Niagara Hollow Punches.....20&2%
Niagara Solid Punches.....55%

Rail—
Sliding Door, Wr't Brass....₩ ℔, 35¢, 40%
Sliding Door, Bronzed Wr't Iron..₩ ft., 7¢
Sliding Door, Iron, Painted..₩ ft., 4¢, 40%
Barn Door, Light..In. ½ ⅝ ¾
Per 100 feet.....$2.00 2.50 3.10, 10%
B. D. for N. E. Hangers—
Small. Med. Large.
Per 100 feet.....$3.15 2.70 3.25 Net
Terry's Steel Rail.....₩ ft., 4½¢
Victor Track Rail, 7¢ ₩ foot.....50&2%
Carrier, double braced, Steel Rail, ₩ foot.....3½@4¢
Lundy Parlor Door, Planed Edge, ₩ ft.7¢
Moore's Steel Rail.....25&10%
Moody Steel Rail ₩ ft., 5¢..... .....45%

Rakes—
Cast Steel, Association g'ds..70@70&5&2%
Cast Steel, outside g'ds,.....70@70&5&2%
Malleable.....70@70&5%
Gibbs' Lawn Rake.....₩ doz., $4.90
Gibbs' Canton Lawn Rake...₩ doz., $3.75
Gibbs' Acme Lawn Rake....₩ doz., $4.75
Gibbs' Favorite Lawn Rake.₩ doz., $3.90
Gibbs' Crown Lawn Rake, No. 1..... ₩ doz., $4.90; No. 2, $5.40
Oneida Lawn Rake.....₩ doz., $6.00
Fort Madison Prize Bow Brace and Peerless.....65%
Fort Madison Steel Tooth Lawn Rake, $6.00.....25%

Razors—
J. R. Torrey Razor Co.....20%
Wostenholm and Butcher, $10 to £....10%
Jordan's AAA1, new list.....Net
Jordan's Old Faithful, new list.....Net
Galvanic.....₩ doz., $15.00
Electric Cutlery Co.....Net
Campbell Cutlery Co.....50%

Razor Strops—
See *Strops, Razor.*

Registers —
Moore's Japanned.....75%
Moore's Electroplated.....75%
Moore's Bronze Finishes.....70%
Moore's Solid Bronze.....65%
Moore's Stove Pipe... .....33⅓

Rings and Ringers—
Bull Rings—
Union Nut Co.....55%
Sargent's.....75&10%
Hotchkiss' low list.....30%
Humason, Beckley & Co.'s.....70&10%
Peck, Stow & W. Co.'s..50&10@50&10&10%
Ellrich Hdw. Co., White Metal, low list. 50@50&10%

Hog—
Top of the Hill Ringers.....₩ doz $2.00
Top of the Hill Rings.....₩ doz $1.25
Hill's Improved Ringers.....₩ doz $1.25
Hill's Old Style Ringers.....₩ doz $1.12½
Hill's Tongs.....₩ doz $3.00
Hill's Rings.....₩ doz bxs $1.00
Perfect Rings.....₩ doz bxs $1.50
Perfect Ringers.....₩ doz $2.15@$2.25
Blair's Hog Ringers.....₩ doz $2.00
Blair's Hog Rings.....₩ doz 90¢@$1.00
Champion Ringers.....₩ doz $2.00
Champion Rings, Double.....₩ doz $2.25
Brown's Ringers.....₩ doz $2.00
Brown's Rings.....₩ doz $1.15@$1.25
Electric Hog Rings.....₩ doz boxes $1.50
Electric Hog Ringers.....₩ doz $2.00
Major Rings.....₩ doz $1.25
Major Ringers.....₩ doz $2.00

Rivets and Burrs—
Norway Iron list Nov. 17, '87....60&10%
Second quality.....70%
Copper .....60@60&10%
Coppered Iron, Bettina Brand.....50&5%

Rivet Sets—See *Sets.*

Roasting and Baking Pans—See *Pans, Roasting and Baking.*

Rods—
Stair, Brass.....25@30%
Stair, Black Walnut.....₩ doz 40¢

Rollers—
Barn Door, Sargent's list. ....60&10&10%
Acme Moore's Anti-Friction.....55%
Union Barn Door Roller.... . .....70%
Moore's Barn Door Stay 50%
Thompson Mfg. Co.'s Lawn Rollers ..30%

Rope—The following prices are f.o.b., New York or factory, and are shaded ½¢@¾¢ on large lots; terms, 1½% for cash.
Manila, 7-16 in. diam. and larger ₩ ℔ 9 ¢
Manila.....⅜ in. ₩ ℔ 9½¢
Manila.....½ and 5-16 in. ₩ ℔ 10 ¢
Manila, Tarred Rope..... ₩ ℔ 8½¢
Manila, Hay Rope..... ₩ ℔ 8½¢
Sisal.....7-16 inch and larger ₩ ℔ 7½¢
Sisal.....⅜ in. ₩ ℔ 8 ¢
Sisal.....½ and 5-16 in. ₩ ℔ 8½¢
Sisal, Hay Rope..... ₩ ℔ 7½¢
Sisal, Tarred Rope..... ₩ ℔ 7 ¢
Sisal, Medium Lath Yarn..... ₩ ℔ 7 ¢
New Zealand..7-16 in. & larger ₩ ℔ 7 ¢
New Zealand.....⅜ inch, ₩ ℔ 7¾¢
New Zealand..½ and 5-16 inch, ₩ ℔ 8¾¢
New Zealand, Hay Rope..... ₩ ℔ 6¾¢
New Zealand, Tarred Rope.... ₩ ℔ 6¼¢
Cotton Rope.....₩ ℔ 13½@16¢
Jute Rope..... ....₩ ℔ 6¾@7¢

Wire—
List February, 1892. All kinds.....45%

Rules—
Boxwood.. .....80&10&10@80&10&10&10%
Ivory.....50&10%
Starrett's Steel Rules and Straight Edges.....25&10%

Sad Irons—See *Irons, Sad.*

Sand and Emery Paper and Cloth—
See *Paper and Cloth.*

Sash Cord—See *Cord, Sash.*

Sash Locks—*See Locks, Sash.*

Sash Weights—
See *Weights, Sash.*

Sausage Stuffers or Fillers—See *Stuffers or Fillers, Sausage.*

Saws—
Disston's Circular.....45@45&5%
Disston's Cross Cut, list Jan. 1,'93.40&10%
Disston's Hand.....25%
Woodrough & McParlin.
Hand, Panel and Rip.....25&10%
Cross Cuts, list Jan. 1, 1893.....45&10%
Wheeler, Madden & Clemson Mfg. Co.
Hand, Panel and Rip.....30&10%
Cross Cut, list Jan. 1, 1893.....45&10%
Atkins' Circular..... .....50&10%
Atkins' Cross Cuts, new list. 40%
Atkins' Mulay, Mill and Drag.....50&10%
Atkins' One-Man Saw.....40%
Atkins' Wood Saws.....40%
Peace Circular and Mill.....45@45&5%
Peace Hand Panel and Rip.....25@25&5%
Peace Cross Cuts, list Jan. 1,'93...45&10%
Richardson's Circular and Mill.45@45&5%
Richardson's X Cuts, list Jan. 1, '93.45&10%
Richardson's Hand, &c . .. .25@25&5%
C E. Jennings & Co.'s brand... . ....25%

Hack Saws—
Griffin's, complete.....40&10@50
Griffin's Hack Saw Blades.....40&10@50
Star Hack Saws and Blades.....25%
Eureka and Crescent.....25%

Scroll—
Lester, complete, $10.00.....25%
Rogers, complete, $4.00.....25%
Barnes' Builders' and Cab Makers'$15,25%
Barnes' Scroll Saw Blades.....35%

Saw Frames—
See *Frames, Saw.*

Saw Sets—See *Sets, Saw.*

Saw Tools—See *Tools, Saw.*

Scales—
Hatch, Counter, No. 171, good quality, ₩ doz $18.00@$19.00
Hatch, Tea, No. 161....₩ doz $6.50@$7.00
Union Platform, Plain.....$2.10@2.20
Union Platform, Striped.....$2.40@2.50
Chatillon's Grocers' Trip Scales.....50%
Chatillon's Eureka.....25%
Chatillon's Favorite.....40%
Family, Turnbulls.....30@30&10
Riehle Bros.' Platform.....40%

Scale Beams—
See *Beams, Scale.*

Scissors, Fluting.....45%

Scrapers—
Adjustable Box Scraper (S. R. & L. Co.) $6.00.....30&10%
Box, 1 Handle.....₩ doz $2.25@$2.50
Box, 2 Handle.....₩ doz $3.00@$3.25
Defiance Box and Ship.....20&10%
Foot.....50&10&60%
Ship, Common..... ....₩ doz $3.50 net
Ship, R. I. Tool Co.....10%

Screen Window and Door Frames—See *Frames*

Screw Drivers—
See *Drivers, Screw*

Screws—
Bench and Hand—
Bench, Iron..... ....55&10@55&10&10%
Bench, Wood, Beech.... .....₩ doz $2.25
Bench, Wood, Hickory.....20&10%
Hand, Wood..... .....25&10@25&10&5%
Hand, Grand Rapids, list.....35%

Coach, Lag and Hand-Rail—
Lag, Blunt Point, list Jan. 1, 1890..... 80@80&10%
Coach and Lag, Gimlet Point, list Jan. 1, 1890..... .....80@80&5%
Hand Rail, Sargent's..... .....70&10%
Hand Rail, H. & B. Mfg. Co....70&10@75%
Hand Rail, Am. Screw Co.....75%

Jack Screws—
Jack Screws, Millers Falls list.50@50&10%
Jack Screws, P., S. & W.....35%
Jack Screws, Sargent.....70%
Jack Screws, Stearns'.....40@40&10%

Cork—
Humason & Beckley Mfg. Co..40&10@50%
Williamson's.....33⅓@33⅓&5%
Detroit Cork Screw Co.....33⅓%

Machine—
Flat Head Iron.....65%
Round Head Iron.....60%

Wood—
List January 1, 1891.
Flat Head Iron.....70%
Round Head Iron.....65% } Extra 10 or 10& 10%often given.
Flat Head Brass..... ....70%
Round Head Brass.....65%
Flat Head Bronze.....70%
Round Head, Bronze: ...65%
Rogers' Drive Screws.....82½%

Scroll Saws—See *Saws, Scroll.*

Scythes—
Grain.....40&5@40&10%
Grass.....40&10&50%

Scythe Snaths—
See *Snaths, Scythe.*

Sets—
Awl and Tool—
Aiken's Sets, Awls and Tools, No. 20, ₩ doz$10.00.... .....60@60&5%
Fray's Adj. Tool Hdls., Nos. 1, $12; 2, $18; 3, $12; 4, $9.....45%
Millers Falls Adj. Tool Hdls., Nos. 1, $12; 2, $18.....25%
Henry's Combination Haft...₩ doz $6.50
Stanley's Excelsior: No. 1, $7.50; No. 2, $4.00; No. 3, $5.50.....30&10%
Common Brad Sets, No. 42, $10.50; No. 43, $12.50...70&10&5%

Nail—
Square.....₩ gr. $4.00@$4.25
Round .....₩ gr. $3.25
Buck Bros.....27½%
Cannon's Diamond Point...₩ gr. $12, 20%

Rivet—
Regular list..... .....70%

Saw—
Stillman's Genuine...₩ doz $5.00@7.75, 40&5%
Stillman's Pattern, Hand, ₩ doz $3.25; Cross Cut, $6.50..... 55@55&10%
Common Lever.....₩ doz $2.00, 45@50%
Morrill's No. 1, $15.00.....40&20%
No. 11, $16.00.....40&20%
Nos. 3 and 4, Cross Cut, $23.00..40&20%
No. 5, Mill, $31.00.....40&20%
No. 10, $15.50.....40&20%
Leach's..No. 0, $8.00; No. 1, $15...15@20%
Nash's.....20&10@20&10&10
Hammer, Hotchkiss.....$5.50, 10%
Hammer, Bemis & Call Co.'s new Pat.45%
Bemis & Call Spring Hammer..... 30&5%
Bemis & Call Co.'s Plate.....20%
Bemis & Call Co.'s Cross Cut..... ..30&5%
Aiken's Genuine.....$18.00, 55@55&10%
Aiken's Imitation.....$9.00, 55@55&10%
Hart's Pat. Lever.....20%
Disston's Star..... .....25%
Leopold.....40&10@50%
Atkin's Lever.....₩ doz No. 1, $6.00
Atkin's Criterion.....₩ doz No. 1, $6.00
Croissant (Keller), No. 1, $15.00; No. 2, $24.00.....40&10@50%
Avery's Saw Set and Punch.....50%
Kohler's Royal.....₩ doz $7.00
Kohler's Giant Royal.....₩ doz $12.00
Crescent.....₩ doz $3.00
Lloyd's Acme.....₩ doz $15, 40&10%
Taintor Positive.....₩ doz $18, 50%

Sharpeners, Knife—
Larkins'.
Applewood Handles...₩ doz. $6.00, 40%
Rosewood or Cocobola. ₩ doz. $9.00 40%

Shaves, Spoke—
Iron.....45%
Wood.....30%
Bailey's (Stanley R. & L. Co.)....40&10%
Stearns'.....30&10%
Cincinnati.....25&10%
Goodell's ₩ doz. $9.00.....25%

Shears—
American (Cast) Iron..75&10@75&10&5%
Barnard's Lamp Trimmers..₩ doz. $3.75
Seymour's, List Dec. 1881. 60&10&10@60&10&10&5%
Heinisch's, List Dec. 1881. 60&10&10@60&10&10&5
Heinisch's Tailor's Shears.....33⅓&5
Cast Steel Trimmers:
First quality..... 80@80&10%
Second quality.....80&10@80&10&10%
Acme Cast Shears.....10&10%
Diamond Cast Shears.....10%
Clipper.....10&10%
Victor Cast Shears.....75&10@75&10&5%
Howe Bros. & Hulbert, Solid Forged Steel.....40%
Hatch Cutlery Co., Solid Steel Forged.60%
Davenport Cutlery Co..... .60@60&10%
Clauss brand, Japanned.....70%
Clauss brand, Nickeled, same list.....60%
Galvanic 3½ to 9 in., ₩ doz. $1.00 ₩ inch
Electric Cutlery Co .....Net
Campbell Cutlery Co., Jap'd.....75%
Nickel Plated.....65%

Tinners' Snips—
Wrt. Handles, Steel Blades. ..20@20&10%
Niagara Snips and Shears. ...20&10%
Cast Handles, Laid with Steel 40%

Pruning Shears and Hook
Disston's Combined Pruning Hook and Saw.....₩ doz. $18.00, 20&10%
Disston's Pruning Hook, ₩ doz. $12.00 20&10%
E.S.Lee & Co.'s Pruning Tools.50&10@70%
Pruning Shears, Henry's Pat., ₩ doz. $3.75@$4.00
Henry's Pruning Shears, ₩ doz. $4.25 @$4.5
Wheeler, M. & C. Co., Combination, ₩ doz $12.00
Dunlap's Saw and Chisel, ₩ doz $8.50,30%
J. Mallinson & Co., No. 1, $5.25; No. 2, $7.25
P., S. & W. Co.....60%
Levin Pruner No. 1, $15.00 ₩ doz..40&3%
Levin Pruner No. 2, $21.00 ₩ doz...40&3%

Tinners', &c.—
Shears and Snips (P. S. & W.).....20@33⅓
Snips, J. Mallinson & Co.....33⅓%

Sheaves—
Sliding Door—
M. W. Co., list July, 1888....50&10@60&5%
R. & E., list Dec. 18, 1885.....55&20%
Corbin's list.....60&10&2%
Patent Roller.....60&10&2%
Patent Roller, Hatfield's.....75%
Russell's Anti-Friction, list Dec. 18, 1885.....60&3%
Moore's Anti-Friction.....50%

Sliding Shutter—
R. & E., list Dec. 18, 1885.....60&10&2%
Sargent's list.....70%
Reading list.....60&10&10%

Shells—
First quality 4, 8, 10 and 12 gauge 25&10&3%
First quality Rival, Club and Climax brands, 14, 16 and 20 gauge ($7.50 list).....20&10&2%
Prize.....40&3%
Star, Club, Rival and Climax Brands... 33⅓&10&2%
Smokeless brand, 12, 10, 16 gauge. 33⅓&10&2%
Trap brand, 12 and 10 gauge..33⅓&10&2%
Seibold's Comb. Shot Shells.....15&2%
Brass Shot Shells, 1st quality.....60&2%
Brass Shot Shells, Club, Rival, Climax. 65&2%

Shells, Loaded—
Standard List, July 19, 1890..... 40&10&10@40&10&10&1 &
Ship Tools—
L. & I. J. White.....30&10

Shoes, Horse, Mule, &c.—
Horse—
Burden's, Perkins', Phœnix, Standard, Diamond State, Bryden's Boss and Crescent, at factory.....$4.00
Bryden's Frog Pressure, at factory..$5.00
Mule—
Add $1 ₩ keg to above prices.
Ox Wrought—
Ton lots.....₩ ℔ 9¢
1000 ℔ lots.....₩ ℔ 9½¢
500 ℔ lots.....₩ ℔ 10¢

Shot—
	Small lots.	
Drop, up to B, 25-℔ bag	$1.45	In ton lots ½¢ dis. count of 5¢ ₩ bag (25 ℔) is made.
Drop, up to B, 5-℔ bag	.35	
Drop, B and larger, 25-℔ bag	1.70	
Drop, B and larger, 5-℔ bag	.40	
Buck and Chilled, 25-℔ bag	1.70	
Buck and Chilled, 5-℔ bag	.40	
Dust Shot, 25-℔ bag	2.00	
Dust Shot, 5-℔ bag	.45	

Shovels and Spades—
Ames' Shovels, Spades, &c., list Nov. 1, 1886.....50%
NOTE.—Jobbers frequently give 5@7½% extra on above.
Griffith's Black Iron.....50&10%
Griffith's C. S. .....60@60&5%
Griffith's Solid C. S. R. R. Goods.....20%
St. Louis Shovel Co.....20@20&7½%
Hussey, Binns & Co.....15@25%
Hubbard & Co.... .....20@20&7½%
Lehigh Mfg. Co.....60&10%
H. M. Myers Co.....50%
Payne Pettebone & Son.....33⅓&5%
Remington's (Lowman's Pat.)40&10@50%
Rowland's Black Iron..60&10@50&10&5%
Rowland's Steel.....60&5@60&10%
Terra Haute Shovel & 25%

Shovels and Tongs—
Iron Head.....60&10@60&10&5%
Brass Head..... .....60&10&10%

Sieves and Sifters—
Mann's Tin Rim..... 50&25%
Buffalo Metallic, S. S. & Co....50&25&20%
Shaker (Barler's Pat.) Flour Sifters ₩ gr $21.0
Electric Light..₩ doz $1.50; ₩ gr $15.00
A. & W. Sifters .₩ gr $15.0
Hunter's Genuine. ₩ doz $1 75, ₩ gr $16.50
Hunter's Imitation..... ₩ doz $1.75; ₩ gr $15.00

Sieves, Wooden Rim—
	Iron	Plated
Mesh 18, Nested, ₩ doz.	$0.80	$1.00
Mesh 20, Nested, ₩ doz.	.95	1.10
Mesh 24, Nested, ₩ doz.	1.15	1.35

Sinks, Wrought Steel—
Columbus, Painted or Unpainted..... 30@30&10%
Columbus, Galvanized and Enameled. 50@50&10%
New Era, Painted.....40&10@50&5%
New Era, Galvanized and Enameled... 60&10&10@70&5%

Skeins, Thimble—
Western list.....75&5@75&10%
Columbus Wrt. Steel..Special net prices
Coldbrookdale Iron Co..... .....60%
Seneca Falls Pattern.....60%
Utica P. S. T. Skeins..... ....60%
Utica Turned and Fitted..... .....35%

Slates—
School, by case.....50&10@50&10&10%

Slaw Cutters—See *Cutters.*

Sleds Hand—
Tubular Steel..... .₩ doz $24.00 40&50
Lots of 6 doz 50%)

Snaps, Harness, &c.—

Anchor (T. & S. Mfg. Co.).....65%
Fitch's (Bristol).....50&10%
Hotchkiss.....10%
Andrews.....50%
Sargent's Patent Guarded.....70&10&10%
German, new list.....40&10%
Covert.....50&10&5&2%
Covert, New Patent.....50&10&5&2%
Covert, New R. E.....60&10&5&2%
Covered Spring.....60&10&10%
Covert's Saddlery Works' Triumph 33⅓%
John Proctor Snaps.....75@75&5%
Kelley & Woolworth's Steel Harness...50&10@60%

Snaths—

Scythe.....50&2@50&5&2%

Soldering Irons—

See *Irons, Soldering.*

Spittoons, Cuspidors, &c.

Standard Fiberware—

Cuspidors, 8½-inch, ₩ doz., No. 5, $8; No. 5X, $9.
Spittoons, Daisy, 8-inch, No. 1, 4; 10 and 11 inch, $6.

Spoke Shaves—

See *Shaves, Spoke.*

Spoke Trimmers—

See *Trimmers, Spoke.*

Spoons and Forks—

Tinned Iron—

Basting, Cen. Stamp. Co.'s list.....70&10%
Solid Table and Tea, Cen. Stamp. Co.'s list.....70&10%
Buffalo, S. S. & Co.....33⅓&2%

Silver Plated—

4 months or 5% cash 30 days:
Meriden Brit. Co., Rogers.....40&15%
C. Rogers & Bros.....40&15%
Rogers & Bros.....40&15%
Reed & Barton.....40@40&5%
Wm. Rogers Mfg. Co.....40, 15&5%
Simpson, Hall, Miller & Co.....40, 15&5%
Holmes & Edwards Silver Co....40, 15&5%
L. Boardman & Son.....50&12½%

Miscellaneous—

Holmes & Edwards Silver Co.:
No. 67 Mexican Silver.....50&10&5%
No. 30 Silver Metal.....50&10&5%
No. 24 German Silver.....50&10&5%
No. 50 Nickel Silver.....50&5%
No. 49 Nickel Silver.....50&10&5%
Wm. Rogers Mfg. Co.:
Rogers' Silver Metal.....50&10&6%
18% Rogers' German Silver.....60&6%
28% Rogers' Nickel Silver.....50&6%
German Silver.....50@50&5%
German Silver, Hall & Elton..50&5% cash
Nickel Silver.....50&5@50&10&5% cash
Brittannia.....60@60&5%
Boardman's Nickel Silver, list July 1, 1891.....60&7½&5%
Boardman's Brittannia Spoons, case lots.....60&5% cash

Springs—

Door—

Torrey's Rod, 39 in.....₩ doz $1.20@1.2
Warner's No. 1, ₩ doz $1.50; No. 2, $3.40.....55@55&10%
Gem (Coil), list April 19, 1886.....20%
Star (Coil), list April 19, 1886.....20&10%
Victor (Coil).....60&10@60&10&5%
Champion (Coil).....60&10@60&10&10%
Cowell's, No. 1, ₩ doz $18.00; No. 2, $16.00.....50@50&10%
Rubber, complete, ₩ doz $4.50.....55&10%
Hercules.....50@50&10%
Phœnix.....33⅓%

Carriage, Wagon, &c.—

Elliptic, Concord, Platform and Half Scroll.....60&10@60&10&10&10 or net prices
Cliff's Bolster Springs.....25%

Squares—

Steel and Iron.....
Nickel-Plated.....} ..80&10&10@80&25%
Try Square and T Bevels. ..60&10&10%
Disston's Try Square and T Bevels. . 50%
Winterbottom's Try and Miter....30&10%
Starrett's Micrometer Caliper Squares. 25%
Avery's Flush Bevel Squares.....40%
Avery's Bevel Protractor.....50%

Squeezers—

Fodder—

Blair's.....₩ doz $2.00
Blair's "Climax".....₩ doz $1.25

Lemon—

Corcelain Lined, No. 1....₩ doz $6.00 25&30%
Wood, No. 2.....₩ doz $3.00, 35%
Wood, Common.....₩ doz $1.70@1.75
Dunlap's Improved.....₩ doz $3.75, 20%
Sammis....No. 1, $5.00; No. 2, $9; 12, $18 ₩ doz.....25&10%
Jennings' Star.....₩ doz $2.50
The Boss.....₩ doz $2.50
Dean's..Nos. 1, ₩ doz $6.50; 2, $3.35; 3, $1.90; Queen, $2.50
Little Giant.....50@50&5%
King.....40&5%
Hotchkiss Straight Flash....₩ doz $12.00
Silver & Co., Glass.....₩ gro. $9.00

Standard Fiber Ware—

See *Ware, Standard Fiber.*

Staples—

Barbed Blind, ¼ in. and larger.₩ ₺ 7@7½@
Barbed Blind, ¾ in.....₩ ₺ 8@8½@
Fence Staples, Galvanized. } Same price as B'rb Wire
Fence Staples Plain..... } See Trd. Rep
Grand Crossing Tack Co.'s list....75&10%

Steelyards—

.....40&10@50%

Stocks and Dies—

Blacksmith's:
Waterford Goods.....35%
Butterfield's Goods.....35%
Lightning Screw Plate.....25@30%
Reece's New Screw Plates.....25@30%
Reversible Ratchet.....30%
Gardner.....25%
Green River.....25@30%

Stops, Bench—

Morrill's, ₩ doz, No. 1, $10.00; No. 2, $11.00 40&20%
Hotchkiss's.....₩ doz $5, 10@10&10%
Weston's, No. 1 0 No. 2, $9, 25&10&5%
McGill's, ₩ doz $3.....10%
Cincinnati.....25&10%
Terrell's Nos. 1 and 2, ₩ doz., $3; No. 3, $3.60.....30%
Millers Falls.....25%
Stearns'.....20&10%

Stone—

Stones, Grind—See *Grindstones.*

Scythe Stones—

Pike Mfg. Co., list April, 1892.....33⅓%
Cleveland Stone Co., list Nov. 1892..33⅓%

Oil Stones, &c.—

Pike Mfg. Co:
Hindostan No. 1, ₩ ₺....8¢
Sand Stone.....5¢
Turkey Oil Stone, 4 to 8 in.....80¢
Turkey Slips.....$2.00
} 40 @ 40& 10%
Lily White Washita.....60¢
Rosy Red Washita.....60¢
Washita Stone, Extra.....50¢
Washita Stone, No. 1.....40¢
Washita Stone, No. 2.....30¢
Lily White Slips.....90¢
Rosy Red Slips.....90¢
Washita Slips, Extra.....80¢
Washita Slips, No. 1.....70¢
Arkansas Stone, No. 1, 3 to 5½ in., $2.80
Arkansas Stone, No. 1 5½ to 8 in., $3.50
} 33⅓@33⅓&10%
Lake Superior.....₩ ₺ 13¢
Lake Superior Slips.....₩ ₺ 20¢

Stove Polish—

See *Polish, Stove.*

Stretchers Carpet—

Cast Steel, Polished.....₩ doz $2.2
Cast Iron, Steel Points.....₩ doz 75@80¢
Socket.....₩ doz $1.75
Bullard's.....25@25&10%

Strops, Razor—

Genuine Emerson.....60@60&5%
Imitation "..₩ doz $2.00, 20&10&5%
Torrey's.....20%
Badger's Belt and Com.....₩ doz $2.00
Lamont Combination.....₩ doz $4.00
Jordan's Pat. Padded, list Nov. 1, '89, 50%
Electric Cutlery Co.....Net
Campbell Cutlery Co.....Net

Stuffer, Sausage—

Miles' Challenge, ₩ doz $20.....50@50&5%
Perry....₩ doz, No. 1, $15.00; No. 0, $21.00.....50&5@50&10%
Draw Cut No. 4, each $30.00.....20%
Enterprise Mfg. Co., list Jan 17, '93..25%
Silver's.....40&10%

Sweepers, Carpet and Lawn—

Carpet—

Bissell No. 5.....₩ doz $17.00
Bissell No. 8.....₩ doz $20.00
Bissell, Grand.....₩ doz $36.00
Standard.....₩ doz $24.00
Domestic.....₩ doz $21.00
Domestic, No. 2.....₩ doz $22.00
Grand Rapids.....₩ doz $24.00
Crown Jewel, No. 1, $18.00; No. 2, $19.00; No. 3, $20.00
Magic.....₩ doz $15.00
Improved Parlor Queen, Nickeled.....₩ doz $27.00
Japanned.....₩ doz $24.00
Excelsior.....₩ doz $22.00
Garland.....₩ doz $18.00
Parlor Queen.....₩ doz $24.00
Housewife's Delight.....₩ doz $15.00
Ladies' Friend.....₩ doz $15.00
Ladies' Friend No. 2.....₩ doz $16.00
Advance.....₩ doz $18.00
Our Leader.....₩ doz $19.00
Triumph.....₩ doz $20.00
Goshen.....₩ doz $21.00
Supreme.....₩ doz $22.00
Easy.....₩ doz $22.00
Gilt Edge.....₩ doz $24.00
Acme.....₩ doz $26.00
Imperial.....₩ doz $26.00
Grand Republic.....₩ doz $30.00
Banner.....₩ doz $22.00
The Star.....₩ doz $21.00
Reliable.....₩ doz $22.00
The Rapid.....₩ doz $22.00
Our Own.....₩ doz $27.00
Model.....₩ doz $27.00

Goshen Sweeper Company, Grand Rapids, Mich., make the following rebates:
5 dozen in 6 months.....₩ doz $1.00
10 dozen in 6 months.....₩ doz $2.00
25 dozen in 6 months.....₩ doz $3.00
Except on L.F., when 10 dozen price is $13.50, and 25 dozen $13.00.

Lawn—

Thompson Mfg. Co.....30%

Swings—

Davies Lawn.....25%

Tacks, Brads &c.—

List October 19, 1889. Old established straight Weights. Short Weight goods are sold at lower prices.

Carpet Tacks—
American, Blued.....66⅔&5%
American, Tin'd and Cop'd.....70%
Steel, Bright and Blued.....66⅔&5%
Steel, Tinned and Coppered.....70%
Swedes Iron, Blued.....72½&5%
Swedes Iron, Tinned.....75%
American Iron Tacks, Domestic.66⅔&5%
Swedes Iron Tacks—
S. S., Blued.....66⅔&5%
S. S., Tinned.....70%
Lanc., Blued.....55%
Lanc., Tinned.....60%
Gimp and Lace Tacks—
S. S., Blued.....62½&5%
S. S., Tinned.....66⅔&5%
Lanc., Blued.....55%
Lanc., Tinned.....60%
Basket and Trimmers' Tacks—
Lanc.....52½&5%
S. S.....55%
Hungarian Nails.....60%
Common and Patent Brads.....55%
Leathered Tacks.....10%
Brush Tacks, S. S.....60%
Looking Glass Tacks, S. S.....35%
Picture-Frame Points, S. S.....35%
Finishing Nails.....60%
Trunk and Clout Nails—
Black.....65%
Tinned or Coppered.....67½&5%
Basket Nails.....60%
Chair Nails.....52½&5%
Cigar Box Nails.....45%
Tin Capped Nails.....50%

Extra discount 25&2½%

Miscellaneous—

Double Point.....90@90&10%
Wire Carpet Nails.....50&10%
Claw Handle Carpet.....₩ gross $4.00
Bonnie Blue.....₩ box 1.50
Bill Nye Brad Box.....4 00
Parisian Gilt Nails, cartoon.....50
Home Tacks, No. 50 ₩ case (12 cartons), $36.00; No. 100, ₩ case (12 cartons), $72.00
Home Nails, No. 200, ₩ case (12 cartons), $30.00; No. 400, ₩ case (12 cartons), $60.00.
} 50&2½%
Upholsterers' Nails.....50&10%

Wire Brads and Nails

Steel-Wire Brads, R. & E. Mfg. Co.'s list 50&10%

See also *Nails, Wire.*

Tanks, Oil—

Emerald, S. S. & Co.: 30-gal. $8.75; 60-gal., $11 each.....50&10&5%

Tapes, Measuring—

American.....40@40&5%
Spring.....40%
Chesterman's, Regular list.....25@30%

Thermometers—

Tin Case.....80@80&10%

Thimble Skeins—See *Skeins.*

Ties, Bale—Steel.

Standard Wire, list.....50&10&5%

Tinners' Shears, &c —

See *Shears, Tinners' &c.*

Tinware—

Stamped, Japanned and Pieced, list Jan 20, 1887.....70&10@70&25%

Tire Benders, Upsetters, &c.—See *Benders and Upsetters, Tire.*

Tobacco Cutters—

See *Cutters, Tobacco.*

Tools—

Coopers'—

Bradley's.....20%
Barton's.....20@20&5%
L. & I. J. White.....20&5%
Albertson Mfg. Co.....25%
Beatty's.....30%
Sandusky Tool Co.....30@30&5%
Shaves Cincinnati Tool Co.....20%

Lumber—

Ring Peavies, "Blue Line"..₩ doz $20.00
Ring Peavies, Common.....₩ doz $18.00
Steel Socket Peavies.....₩ doz $21.00
Mall, Iron Socket Peavies...₩ doz $19.00
Cant Hooks, "blue Line"....₩ doz $16.00
Cant Hooks, Common Finish..₩ doz $14.00
Cant Hooks, Mall. Socket Clasp, "Blue Line" Finish.....$16.00
Cant Hooks, Mall. Socket Clasp, Common Finish.....₩ doz $14.50
Cant Hooks, Clip Clasp, "Blue Line" Finish.....₩ doz $14.00
Cant Hooks, Clip Clasp, Common Finish.....₩ doz $12.00
Hand Spikes....₩ doz 6 ft., $15.00; 8 ft., $20.00
Pike Poles, Pike & Hook, ₩ doz, 12 ft., $11.50; 14 ft., $12.50; 16 ft., $14.50; 18 ft., $17.50; 20 ft., $21.50.
Pike Poles, Pike only, ₩ doz, 12 ft., $10.00; 14 ft., $11.00; 16 ft., $13.00; 18 ft., $16.00; 20 ft., $20.00.
Pike Poles, not ironed, ₩ doz, 12 ft., $6.00; 14 ft., $7.00; 16 ft., $9.00; 18 ft., $12.00; 20 ft., $16.00.
Setting Poles, ₩ doz, 12 ft., $14.00; 14 ft., $15.00; 16 ft., $17.00.
Swamp Hooks.....₩ doz $18.00

Saw—

Atkins', new list.....40%

Transom Lifters—

See *Lifters, Transom.*

Traps—

Game—

Newhouse.....40@40&5%
Oneida Pattern.....70&10%
Game, Blake's Patent.....40&10&5%

Mouse and Rat—

Mouse Wood, Choker, ₩ doz holes, 9@10¢
Mouse, Round Wire.....₩ doz $1.50 10%
Mouse, Cage, Wire.....₩ doz $2.50 10%
Mouse, Catch-'em-alive..₩ doz $2.50 15%
Mouse, Bonanza.....₩ doz 0.90@$1.00
Rat, Decoy.....₩ gr $10.00, 10%
Ideal.....₩ gr $10.00
Cyclone.....₩ gr $5.25
Hotchkiss Metallic Mouse, 5-hole traps, ₩ doz., 75¢; in full cases, ₩ doz. 60@65¢
Hotchkiss Imp. Rat Killer...₩ gro $18.50
Hotchkiss New Rat Killer...₩ gro $16.50
Schuyler's Rat Killer.....₩ gro $15.00
Dandy.....₩ doz.. $1.75
Waddel's Go Bang, ₩ gro.....$12.50

Fly—

Harper, Champion or Paragon ₩ doz. $1.75, ₩ gro. $16.50
Balloon, Globe or Acme ₩ doz. $1.50, ₩ gro. $13.50

Triers—

Butter and Cheese.....25%

Trimmers, Spoke—

Bonney's.....₩ doz $10.00, 50%
Stearns'.....20&10%
Ives', No. 1, $15.00; No. 2, $12.00 ₩ doz. 55&10%
Douglas'.....₩ doz $9.00, 20%
Cincinnati.....25%

Trowels—

Lothrop's Brick and Plastering, 20&10&5@35%
Reed's Brick and Plastering.....15%
Disston's Br'k and Plastering.25@25&10%
Peace's Plastering.....25@25&5%
Clement & Maynard's.....20@20&5%
Rose's Brick.....15@20%
Brade's Brick.....25%
Worrall's Brick and Plastering.....20%
Garden.....70%
Cleves' Angle Trowel, ₩ gro, No. 1, $36; No. 2, $30; No. 3, $15. net @ 10%

Trucks, Warehouse, &c.—

B. & L. Block Co.'s list.....40%
Thompson Mfg. Co.....40%
Barnes' Barrel Trucks.....40%

Tubes Boiler—

See Pipe

Twine—

Flax Twine—

	BC.	B.
No. 9, ¼ and ⅛ ₺ Balls	35¢	31¢
No. 12, ¼ and ⅛ ₺ Balls	22¢	30¢
No. 18, ¼ and ⅛ ₺ Balls	20¢	29¢
No. 24, ¼ and ⅛ ₺ Balls	20¢	29¢
No. 36, ¼ and ⅛ ₺ Balls	18¢	28¢
No. 264 Mattrass, ¼ and ⅛ ₺ Balls,	52@54¢	
Chalk Line, Cotton, ⅛ ₺ Balls	.25¢	
Mason Line, Linen, ⅛ ₺ Balls	.55¢	
2 Ply Hemp, ¼ and ⅛ ₺ Balls (Spring Twine)	15½¢	
3-Ply Hemp, 1 ₺ Balls	16¢@16½¢	
3-Ply Hemp, 1½ ₺ Balls	15¢@15½¢	
Cotton Wrapping, 5 Balls to ₺	..15¢@16¢	
2, 3, 4 and 5 Ply Jute, ⅛ ₺ Balls	.10¢	
Wool	6½¢@6¾¢	
Paper	13¢@14¢	
Cotton Mops, 6, 9, 12 and 15 ₩ to doz.	..18¢	

Vises—

Solid Box.....50&10@60%

Parallel—

Fisher & Norris Double Screw.....15&10%
Stephens'.....25@30%
Parker's.....20@25%
Wilson's.....55%
Howard's.....40%
Bonney's.....50%
Millers' Falls.....40@40&10%
Trenton.....40&5@40&10%
Merrill's.....15@20%
Hollands'.....35@40%
Sargent's.....70&10%
Backus and Union.....40%
Double Screw Leg.....15&10%
Prentiss.....20@25%
Simpson's Adjustable.....40%
Moore's.....20%
Massey Quick Action.....20@25%

Saw Filers—

Bonney's, Nos. 2 & 3, $15.00.....40&10@50
Stearn's.....33⅓&10@33⅓&10&10%
Stearn's Silent Saw Vises.....33⅓@35%
Hopkins'.....₩ doz $17.50, 10%
Reading.....40&10%
Wentworth.....20&10%
Economy, ₩ doz., Nos. 110, $10.00; 120, $15.00.....50&10&10&5%

Miscellaneous—

Phœnix Vises.....33⅓%
Phœnix Hand Vises....₩ doz $3.60, 33⅓%
Cowell Hand Vises.....20%
Bauer's Pipe Vises.....10%
Cincinnati.....25&10%
Enterprise Pipe Vises.....each $3.00, 40%
Massey Combination Pipe Vise.....40%

Wads—Price Per M.

U.M.C.&W.R.A.—B. E., 11 up..	68¢
U.M.C.&W.R.A.—B. E., 9&10..	82¢
U.M.C.&W.R.A.—B. E., 8.....	96¢
U.M.C.&W.R.A.—B. E., 7.....	$1.10
U.M.C.&W.R.A.—P. E., 11 up.	1.15
U.M.C.&W.R.A.—P. E., 9&10..	1.50
U.M.C.&W.R.A.—P. E., 8.....	1.70
U.M.C.&W.R.A.—P. E., 7.....	1.80
Eley's B. E., 11 and larger....	$1.70@$1.75
Eley's P. E., 12 to 20.....	3.00@ 3.25

Dis. 30&2½%

Wagon Boxes—

See *Boxes, Wagon.*

Wagon Jacks—

See *Jacks, Wagon.*

Ware, Hollow—

Cast Iron, Hollow—

Stove Hollow-Ware—
Ground.....60&10@60&10&10%
Unground.....65&10@70&5%
White Enameled Ware—
Maslin Kettles.....70&10@7[illegible]
Boilers and Saucepans.....60@60&5%
Tinned Boilers and S'pans.....60@60&5%
Rustless Hollow Ware.....50@50&5%
Gray Enameled Ware—
Stove.....50%
Maslin Kettles.....60&60&10%
Boilers and Saucepans.....40&5%

Enameled—

Agate and Granite Ware, list Jan. 1 1889..33⅓&c
Ironclad Enameled Ware.....dis 33⅓&10%
} Extra 10% on some leading articles.

Kettles—

Galvanized Tea-Kettles—

Inch	6	7	8	9
Each	55¢	60¢	65¢	75¢

Standard Fiber—

	Per Doz. Plain.	Decorated.
Wash-Basins, 10½ in.	$1.30	2 00
Wash-Basins, 12 in.	2.00	2.50
Keelers, 11½ in.		3.50
Cuspidors		7.50
Spittoons, "Daisy," 8 in.	3.50	4.00
Peck Measure	3.50	
Half-peck Measure	3.00	

See also Pails.

Indurated Fiber.—

Spittoons No. 2, ₩ doz.....$6.00
Basins, Ringed, ₩ doz., No. 2.....2.80
Washtubs, Nested, Nos. 0, 1, 2 and 3 (4 pieces), ₩ nest.....$5.75
Keelers Nested, Nos. 1, 2, 3 and 4 (4 pieces), ₩ nest.....$2.55
Butter Bowls 15, 17 and 19-inch (3 pieces), ₩ nest.....$1.50
Liquid Measures, pt., qt., 2 qt. and funnel (4 pieces), ₩ set.....$1.20

} 25%

See also Pails.

Silver Plated, Hollow—

4 mo. or 5 % cash in 30 days.
Reed & Barton.....
Meriden Britannia Co.....
Simpson, Hall, Miller & Co.....
Rogers & Brother.....
} 40&5%
Hartford Silver Plate Co.....
William Rogers Mfg. Co.....
} 40&5&5%

Washers—

Size hole	5-16	⅜	½	⅝ to 1¼
Washers	5½	4½	3½	2¾

In lots less than 200 ₺, ₩ ₺, add ½¢, 5-B boxes 1¢ to list.

Washer Cutters—

See *Cutters, Washers.*

Water Coolers—

See *Coolers, Water.*

Wedges—

Iron.....₩ ₺ 3½¢
Steel.....₩ ₺ 3½¢

Weights, Sash—

Solid Eyes.....₩ ton $18.00@$19.00

Well Buckets Galvanized—See *Buckets, Well, Galvanized.*

Wheels Well—

8 in., $3.00 10 in. $3.50 12 in $4.7

Whips

American Whip Co.: Length.	4½	5	5½	6	6½	7	7½	8 ft.
X. L. Whalebone Driving	$18.00	20.00	22.00	24.00	27.00	30.00	33.00	36.00
Eureka, Two-thirds Whalebone.	....	....	15.00	16.50	18.00	20.00	....	....
Bull Bone, Half length Whalebone.	....	....	11.00	12.00	13.00	15.00	....	....
American Standard	8.00	8.50	9.50	10.50	12.00	13.50	15.00	16.50
True Grip, Raw Hide Center	6.00	6.00	6.50	7.00	7.50	9.00	....	....
New Name, Stocked Java, Black and Wine Colors	....	....	....	6.00	...	....	....	....
Americus, 93 Pen Whip	....	....	....	6.00	....	....	....	....
Gents' Light Driving No. 111	....	....	....	6.00	....	....	....	....
Gents' Light Driving No. 106	....	....	....	5.00	....	....	....	....
Hand-made Stocked Java No. 103	....	....	3.75	4.00	....	....	....	....

Per dozen.

A large variety of cheaper grades.....50¢@$3.00
Team Whips.....$2.00@$7.50
Toy Whips.....₩ gro. $2.50@$12.00
Hardware Assortment, 10/American, 75 Whips for $50.00.

Wire and Wire Goods—

Iron—

Market,

Br. & Ann., Nos. 0 to 18, 75&10@75&10&5%
Cop'd, Nos. 0 to 18..75&5%
Galv., Nos. 0 to 18..... 70&5@70&10%
Tin'd, Tin'd list, Nos. 0 to 18.....70@70&10%

Extra 5@10% often given and net prices often made on large lots.

Stone,
Br. and Ann'd, Nos. 16 to 18.....80%
Bright and Ann'd, Nos. 19 to 26.....80&5%
Br. and Ann'd, Nos. 27 to 36 .....82½&5%
Tinned.....65&10%

Extra 10% often given.

Tinned Broom Wire, 18 to 21, ₩ ℔....4¾¢
Galvanized Fence .....75&10%
Brass, list Jan. 18, 1884.....40&5%
Copper, list Jan. 18, 1884.....40@5%
Annealed Wire on Spools.....60%
Malin's An'aled & Tin'd on Spools..60&5%
Malin's Brass and Cop. on Spools...50&5%
Ossawan Mills, An'ld and Tinned on Spools.....60&10%
Ossawan Mills, Brass and Copper on Spools.....50&10%
Tate's Spooled, Tin'd & Annealed..60&5%
Tate's Spooled Cop. and Brass 50%
Cast Steel Wire 50%
Stubs' Steel Wire.....$6.00 to £, 30%
Steel Music Wire, 12 to 30, imported.... 60@70¢ ₩ ℔
Wire Clothes Line, see Lines.
Wire Picture Cord, see Cord.

Bright Wire Goods—

Standard list.....85@85&10%

Wire Cloth and Netting—

Painted Screen Cloth ₩ 100 ft. $1.75@$2.00
Galvanized Wire Netting.....75@75&10%

Wire Barb—

See Trade Report.

Wire Rope—See *Rope, Wire.*

Wrenches—

American Adjustable 40%
Baxter's Adjustable "S".....40&10@50%
Baxter's Diagonal.....60%
Coes' Genuine.....50@50&10%
Coes' "Mechanics".....50&10&3%
Girard Standard.....65&10@70%
Lamson & Sessions' Engineers'....60&10%
Lamson & Sessions' Standard.....70&10%
P. S. & W. Agricultural.....
Girard Agricultural.....
Lamson & Sessions' Agric'l..
W. & B. Diamond.....
75&10@80%

Bemis & Call's:
Pat. Combination Bright .....40&5%
Pat. Combination Black.....40 & 10%
Merrick's Pattern.....45%
Brigg's Pattern.....30&10%
Cylinder or Gas Pipe.....45&5%
No. 3 Pipe 55%
Aiken's Pocket (Bright).....$6.00, 50&10%
The Favorite Pocket.....₩ dos., $4.00, 40%
Webster's Pat. Combination.....25%
Boardman's.....30%
Always Ready.....25&5%
Alligator.....50%
Donohue's Engineer.....20&10%
Eagle.....50&10%
Acme, Bright.....50&5%
Acme, Nickeled.....40&5%
Hercules.....70@70&5%
Walker's.....55&5%
Diamond Steel.....65&5%
Cincinnati Brace Wrenches.....25&10%
Tafts Vise Wrench.....65&10&5%

Wringers, Clothes—

Am. Wringer Co.'s list, Jan. 2, '93..2% cash
Colby Wringer Co., list Sept. 1, '91..2% cash
Lovell Mfg. Co., list Jan. 1, 1892..2% cash
Peerless Mfg. Co., list Feb., 1892..2% cash
National Wringer & Mfg. Co., list June 1, 1892.....2% Cash

Wrought Goods—

Staples, Hooks, &c., list March 17, 1892 85&10@85&10%

News and Notes.

The receivers of the Reading road have obtained authority to issue $3,743,150 of certificates, the protests of some representatives of bond holders being overruled by the court.

A royal commission has been appointed to inquire into the causes of the present agricultural depression in England and to report to the House of Commons what means should be adopted to improve the condition of the industry.

Rumors have been given currency to the effect that a Maltese stoker off duty closed the watertight compartments of the "Camperdown" of his own accord and thus saved the ship.

The New York *World* claims to have made an exhaustive investigation into the condition of the cotton crop, having collected information from 300 centers by telegraph. The reports as summarized show: 1, That the acreage in cotton is somewhat greater than last year, and, 2, that except in a few favored localities, the condition of the crop is not promising. There has been too much rain and too much cool weather since planting time, so that the crop is backward by ten days or two weeks, and in some points of the South insects are working a good deal of harm. The reduction will possibly amount to one-fourth, as compared with last year.

Under stress of circumstances a somewhat exceptional building has been put up by W. D. F. Manice, at the corner of William and Pine streets, New York. The frontage is only 16 feet 3 inches and the depth 57 feet 5 inches, and upon this narrow strip has been built a ten-story structure 135 feet high. The owners of the adjoining properties had declined to purchase the real estate on the ground that no building could be put up on it which would justify a large purchase sum.

It is stated in the daily press that the French Government has authorized the construction of a new and powerful cruiser, to be nearly a duplicate of the United States cruiser "New York." The information has been received in United States naval circles with marked satisfaction. It is the first acknowledgment by a first-class foreign power of the superiority of United States naval construction. It will be noted, naval officers say, that the building of the new navy of the United States began in earnest as late as 1885. In less than ten years the naval constructors of the United States Navy have succeeded in developing a type of war ship which is deemed worthy of copying by France, and France possesses her own schools of naval architecture.

The contractor's trial of the new protected cruiser "Columbia" will take place on Wednesday, July 26. The "Columbia," which is still at Cramp's shipyard, is the first triple-screw vessel built by the Government. She will be docked at League Island, and while there will be examined by the Inspection Board, of which Admiral Belknap is president, her port and starboard screws will be placed in position, and she will be cleaned and painted preparatory to her preliminary trial. She is required to make 21 knots an hour.

The Maryland Steel Company are building a police patrol boat for New York.

The Bureau of American Republics is informed that the Chilian Congress has passed the act for reorganizing the currency, and that having received the sanction of the Council of State, the act has now become law. The act provides that the paper money shall be redeemed from December 31, 1899, in the new money to be coined under the act of November 26, 1892, at the equivalent value of a silver dollar of 25 grams in weight and nine-tenths fine. The paper money may, however, be redeemed from July 1, 1896, in the money to be coined under the act of November 26, 1892, or, in other words, at the rate of 24 pence per dollar. The holders of paper money, therefore, will have the option of redeeming their notes at 24 pence, or in the silver dollar of 25 grams and nine-tenths fine. The paper money will cease to be legal tender after July 1, 1896. To prepare for the new coinage provided for by the act of November 26, 1892, the silver acquired by the State under the act of March 14, 1877, the gold received in the payment of duty and storage, and up to £1,500,000 of the proceeds of the trade of Government nitrate properties, are to be maintained on deposit in the Treasury. From December 31, 1895, until July 1, 1896, the banks must maintain in gold specie or bullion a reserve fund of 20 per cent. of their authorized issue. The paper money redeemed by the State is to be burned. Half of the 50 per cent. of the duties payable in gold under the act of November 26, 1892, in the years 1894 and 1895, shall be paid in the equivalent value of paper money, and the portion of import duties and storage required to be paid in gold may be paid in good bills on London up to December 31, 1894. "Whatever diversity of opinion may exist with respect to the new act," says the *Chilian Times*, "it must be admitted that it is an improvement on the one that preceded it. In one respect, however, both acts are alike. They aim in the first line at the redemption of the paper money and the resumption of specie payments. They differ only in the means of accomplishing these ends." The *Chilian Times* adds that the Government and the country are too far committed to this policy for it to be possible for them to turn back.

Two of the ten great turbine wheels, of 5000 horse-power each, which will constitute part of the immense power plant at Niagara Falls, are now nearing completion at the I. P. Morris Works, Philadelphia. The main sluice gates, which are to admit the water from the inlet canals to each wheel, are also being manufactured in Philadelphia, at William Sellers & Co.'s, Incorporated, which firm are also building the 50 ton traveling crane to be used in the erection and management of the ten wheels. The main building, the power house of steel, which is being constructed by the Pennsylvania Steel Company, near Harrisburg, is also ready for erection.

Judge Lacombe of the United States Circuit Court, on July 1, granted injunctions to the Edison Electric Illuminating Company of New York against the Holland House and the Hotel Imperial, prohibiting them from using incandescent lamps infringing the Edison patent, under which the Edison Electric Illuminating Company are sole licenses in the city of New York. The injunction is suspended in its operation for ten days to enable the hotels in question to obtain other means of illumination. These cases were the first that have been brought against users of the Edison lamp patent as distinguished from manufacturers, and the decision is far-reaching in its effects. It is of great importance, especially in view of the recent refusal of an injunction by Judge Hallett in St. Louis against a Western manufacturer. The decision will be regarded as a rule for all users of other than Edison lamps in the States constituting the second circuit, and other suits will be immediately brought against other users similarly situated. The decision will doubtless secure to the Edison Electric Illuminating Company the incandescent lighting business in New York City, and go a long way toward securing to similar licensees the same privilege in other cities.

LABOR EXCHANGE.

Notices under this heading of reasonable length are inserted free of charge. Only those relating to employment are admitted. Write distinctly on one side of paper only, and do not use postal cards.

HELP WANTED.

At once a good STEAM and HOT WATER FITTER; state wages expected. Wm. W. Myrick, Kingston, Mass. July 15

A reliable, temperate TINSMITH who understands general jobbing, assortment work, and has some knowledge of plumbing and iron-pipe work; state wages, experience and reference. C. M. Hildreth & Son, Lebanon, N. H. July 15

At once, a good TINNER for both inside and outside work; a young man preferred. "S. B. M.," 123 Pittsburgh street, New Castle, Pa. July 15

At once, a sober and reliable TINSMITH, one who can do iron piping and some plumbing, steady employment to good man. Address John G. Hunt, Warrensburgh, Warren County, N. Y. July 15

SUPERINTENDENT for a gasoline and gas stove factory, must be a thorough mechanic, well acquainted with the line of business and capable of handling men. Address, with reference, experience and salary expected, "C. A. P.," office of *The Metal Worker*, 96-102 Reade street, New York City. July 15

A good reliable TINSMITH; to a good, sober, industrious man a steady job and good wages will be given. Apply by letter, stating age, married or single and experience, Burbank, Studd & Metze, Berlin, N. H. July 15

STOVE SALESMAN that is acquainted with the trade in Missouri to represent a good line of goods that is made near that territory and known in that State; give reference and state salary wanted. "R.," office of *The Metal Worker*, 22-24 Pickering Building, Cincinnati, Ohio. June 15

A first-class TINNER and assortment work, also some experience in furnice work; married man preferred; must be steady and sober. S. S. Fox & Co., Marion, Ohio. July 15

At once, a good CORNICE MAKER; one who can estimate from plans and make himself generally useful. "H., S. & M.," office of *The Metal Worker*, 96-102 Reade street, New York City. July 8

A good all round PLUMBER who understands and can do steam and hot-water fitting; must have first-class reference; a permanent place for a reliable man; state wages expected. Harry C. Worrell, Riverton, N. J. July 8

A first-class PLUMBER can obtain steady employment if sober and reliable; one that understands steam and gas-fitting preferred. J. V. Vrooman's Sons, Schenectady, N. Y. July 8

First-class HOT-AIR FURNACE MAN to take charge of our furnace department; must be competent in handling help, a good mechanic and a pusher. A. J. Lindemann & Hoverson Company, 223 Reed street, Milwaukee, Wis. July 8

STOVE SALESMEN for Iowa, Illinois and Wisconsin; Commission. "Stoves," office of *The Metal Worker*, 59 Dearborn street, Chicago, Ill. July 8

Young man to assist in the heating department of an established firm; must be accustomed to hot air furnace, range and tin shop work, and be experienced in estimating, especially from plans and in getting work ready for shipment; one previously employed in this capacity preferred; give explicit particulars. "Thoroughly Reliable," care of *The Metal Worker*, 96-102 Reade street, New York City. July 8

SITUATIONS WANTED.

As a FOREMAN in a mounting shop; has had ten years' experience at same; has worked 18 years in the foundry on stoves and patterns; sober, steady and industrious. H. M. Gwyer, 399 Central Ave., Albany, N. Y. July 15

By a first-class TINNER and IRON SPINNER; 17 years' experience. Chas. Seider, 263 Floyd street, Brooklyn, N. Y. July 15

Young man with three years' experience as TINSMITH desires situation under instruction for 12 months, town or country. "Tinsmith," 187 East Main street, Bridgeport, Conn. July 15

By a PLAIN and ORNAMENTAL JAPANNER as foreman; understands japanning all kinds of tin, iron and woodwork; can furnish the very best of references. "G.," Box 710, office of *The Metal Worker*, 96-102 Reade street, New York City. July 15

PLUMBER and LEAD BURNER would like steady situation; six years' experience; strictly temperate and reliable. "A. B. C.," office of *The Metal Worker*, 96-102 Reade street, New York City. July 15

By an experienced TINNER, an all-around man for in and out door work; married and don't drink; reference if desired. J. C. Scherff, 202 East Seventieth street, New York City. July 15

PATTERN MAKER wants position by September 1; have seven years' experience; two years' steady experience at furnace pattern work; can furnish good reference. Box 200, Webster City, Iowa. July 15

As FOREMAN or SUPERINTENDENT in cornice shop; a first-class draftsman and cutter; also understands estimating on all kinds sheet-iron work; have 16 years' experience; seven years as foreman and cutter; can give best of references. "Cutter," office of *The Metal Worker*, 220 South Fourth street, Philadelphia, Pa. July 15

By married man with 12 years' experience in the PLUMBING, STEAM and HOT WATER HEATING TRADES; can do tin work and can take charge of work; strictly temperate. "J.," Box 395, Middletown, Pa. July 15

As TRAVELING SALESMAN for a furnace or stove foundry; three years' experience in tin shop and retail hardware; can furnish A1 reference as to character and ability. L. F. Grover, Norway, Maine. July 15

A HARDWARE or STOVE SALESMAN, with 15 years' experience—four years on the road—wishes a position with a good firm; in the house or to travel; A1 references given. "Salesman," Box 53, Middletown, Ohio. July 15

By a PRACTICAL TINSMITH; understands all kinds of jobbing; city or country; 18 years' experience. Harris Gold, 92 Essex street, New York City. July15

By an experienced TINSMITH; capable of doing refrigerator work as well as anything in the stove line. Philip Polatscher, 229 Second street, city. July15

TINSMITH, single, in and outside worker, wants a job, city or country. Littmann, 1575 Avenue A, New York. July15

A young PLUMBER and HOT WATER FITTER desires a position; has worked at roofing, spouting, &c.; city or country. "Plumber," 17 Rogers street, Dover, N. H. July 15

TINSMITH, single, 24 years of age, general jobber; has some knowledge of plumbing, wants a steady job; city or country. I. Loewe, 234 Washington street, Hoboken, N. J. July 15

By a practical and experienced STOVE and TINWARE SALESMAN; speaks German and can furnish good references. "K.," 411 Inter-Ocean Building, Chicago, Ill. July 15

By a strictly sober young man; CORNICE and ROOFER; has a good knowledge of drafting, cutting and putting up; also eight years' experience, wishes a steady position. Louis Retman, 111 Delancey street, New York City. July15

ELECTRO PLATER, one who understands plating and oxydizing of all metals, desires situation with firm where the work will be steady; good reference. John Weiler, 940 Lovain street, Cleveland, Ohio. July15

By a PRACTICAL METAL PATTERN MAKER, well up on experimental work; competent to design and make cutting, stamping and combination dies, small tools, jigs, &c., to manufacturing specialties at the lowest cost; nine years as foreman; best of reference; location in or near Chicago preferred. "Mechanic," office of *The Metal Worker*, 59 Dearborn street, Chicago. July 15

By a thoroughly PRACTICAL MECHANIC; understands house heating by steam, hot water and hot-air furnaces; can draft patterns for all kinds of sheet metal work and do work from plans. J. P. Lisk, Box 391, Bridgeport, Conn. July 8

A young man wishes a position in city or country as first-class tinsmith, roofer, tin and sheet-iron worker, general jobber; knows how to repair stoves, ranges and heaters, also a little plumbing. S. Richmond, 31 Monroe street, New York City. July 8

TRAVELING SALESMAN who has been with a tin-plate stamping house for the past 13 years and has taken in all the principal cities in the United States and Canada, desires a situation, either on salary or commission. H. H. Witte, 84 North Washington avenue, Columbus, Ohio. July 8

By an all-round SHEET METAL WORKER, CORNICE and FURNACE MAN of 18 years' experience; can take charge of shop and act as foreman, and works from planes; would be pleased to engage with some firm west of Missouri River by July 10. James Thomas, Denver, Col. July 8

By a TINSMITH and ROOFER, city or country. Geo. McGinis, 197 Mulberry street, New York. July 8

By a TINSMITH, steady job at low wages. H. Marcus, care of Mr. Shipman, 47 Lewis street, New York July 8

SUPERINTENDENT of stove foundry desires position; 11 years' experience with first-class concern; West preferred; first-class reference. "Superintendent," Box 78, office of *The Metal Worker*, 96-102 Reade street, New York City. July 8

By a good TINSMITH with 12 years' experience—three years in this country—at a salary of $2 a day. S. Hyman, 201 Forsyth street, New York. July 8

As FOREMAN by practical tinner of 16 years' experience at roofing, slating, cornice and furnace work; best of reference; small city in Indiana or Illinois preferred. "O. L. R.," 303½ North Thirteenth street, Terre Haute, Ind. July 8

By a TINNER and CORNICE MAKER who can cut patterns and work at hammering and stove work. Chas. J. Lindel, Tuscumbia, Ala. July 8

By a first-class PLUMBER, in city or country; best of references given. Robert Smith, 964 Third avenue, New York City. July 8

A young man, age 26, with 12 years' experience in tin, sheet-iron and cornice work and roofing, understands plumbing and gas fitting and does all kinds of general jobbing, speaks English and German, desires a steady position. H. Altman, 83 Sheriff street, New York City. July 8

By a young man, a steady situation as PLUMBER, to work under instruction; graduate of New York Trades School; has had considerable experience at trade; good reference. P. O. Box 39, Moundsville, W. Va. July 8

TINSMITH and ROOFER, and for other general jobbing. Jacob Samuals, care of Mr. Dzalka, 110 Clinton street, New York City July 8

By a STOVE IRON PATTERN FITTER; several years' experience. "J. L.," office of *The Metal Worker*, 96-102 Reade street, New York City. July 8

CORNICE and SKYLIGHT MAKER, CUTTER and DRAFTSMAN; a thorough mechanic in all branches; capable of taking charge of shop; has experience as foreman; understands handling help to best advantage and work; would like a steady position. "C. D. F.," office of *The Metal Worker*, 96-102 Reade street, New York City. July 8

As PLUMBER by a sober and industrious young man; city or country. Henry J. Schlag, 420 East Fifty-ninth street, New York City. July 8

Position in good cornice shop to assist in cutting and work under instruction; state wages to a steady man. Chapman & Chapman, Hutchinson, Kas. July 8

By a TIN and SHEET-IRON WORKER with ten years' experience; city or country; New York preferred; sober and industrious. "A. G.," care of B. Abel, 189 Christie street, New York. July 8

SHEET METAL PATTERN CUTTER desires position in a first-class cornice shop; thoroughly competent to take entire charge, New York or vicinity preferred. "Pattern Cutter," office of *The Metal Worker*, 96-102 Reade street, New York City. July 8

BRASS FINISHER, soft and hard solderer; city or country. Louis Fried, 124 Lewis street, New York. July 8

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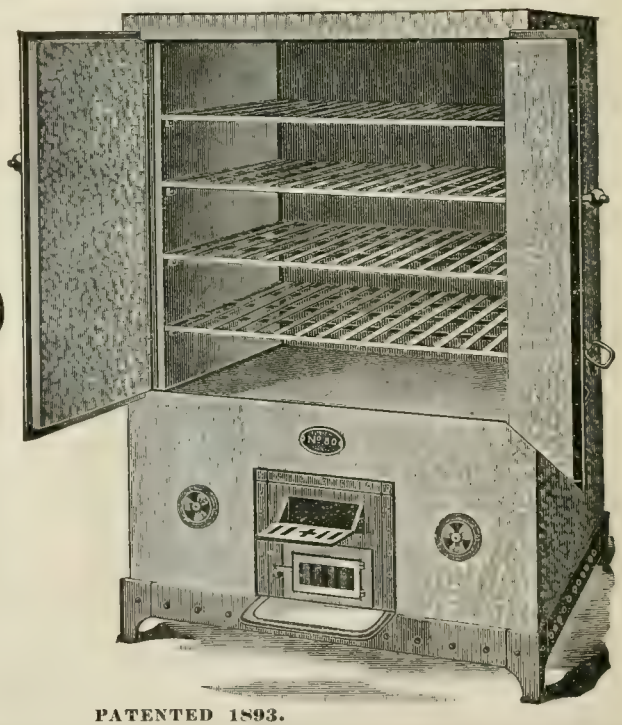

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THE METAL WORKER.

NEW YORK AND CHICAGO.

Saturday, July 22, 1893.

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Col. R. T. Auchmuty.

The news of Colonel Auchmuty's death, given in another column, will come as a shock to many who knew and loved the man. It is, however, some consolation to feel that he passed away leaving the great work of his latter life complete. He had the satisfaction of seeing the enterprise which he founded single-handed, and engineered to a successful issue, flourishing and standing on the firm basis now held by the New York Trade School. The importance of Colonel Auchmuty's work and the untiring zeal and labor expended by him in its accomplishment cannot well be overestimated. Possessed with a passionate enthusiasm for promoting the welfare of young men and a clear idea of the best means for insuring their welfare—namely, to help them to help themselves, the Colonel set himself to work to carry out his conceptions with an earnest purpose and determination which brought success with it. The influence of his personality, too, was far-reaching. Hundreds of students who have passed through his school are now witnesses in every quarter of this country and in Canada to the wisdom and efficiency of Colonel Auchmuty's methods of training, and many feel the beneficial effects of their personal contact with this best type of Christian gentleman at a time of their life when good influences were most needed. In the New York Trade School a lasting memorial will stand, always linked with his name, and in it, "he being dead, yet speaketh."

A Novel Profession.

The host of labor disputes which have marked the past few years in England, and the great loss and inconvenience attendant upon strikes, have caused the evolution of a new profession in that country. There has arisen a class of leaders of men, termed "strike defeaters," whose business is that of breaking down strikes, not by physical or military force, but by the more peaceful method of doing the work of the strikers until they come to terms. One of the most prominent of these individuals, whose name is Graeme Hunter, is described as a powerful, energetic man in mind and body, who lives with his men, but rules them with strict discipline. His methods are in some respects peculiar, and appear slightly arbitrary to an American mind. As described by English journals, Mr. Hunter's system is as follows: He has the reputation of never interfering in a strike until all means of settling it have been exhausted and he believes the strikers to be in the wrong. Then he simply puts his men to work and keeps them at it. He tells his hands how much he gets to do the job, and the way he makes his own remuneration is by simply dividing the whole amount among them according to their labor, less 1 penny out of every 5 shillings they earn, over and above the expenses incurred. He has under his control some 3200 men, whose average wages are about $6 a week, besides board and lodging. They are all obliged to live together near to where they may be working, and Mr. Hunter insists on every married man sending home at least £1 a week to his wife, paying them this amount in postal orders, collectable at the home of the wife. Fines are exacted for the absence from work, &c., and no recognition of union rules is had. It is said that eight of his gangs were recently employed at eight ports, including Liverpool, Glasgow, Greenock, Dublin and Bristol, by which it would seem that these men are all-round laborers and not skilled workers.

The World's Fair.

Every returning visitor to the World's Fair is becoming an active missionary in his home in behalf of that grand undertaking. The influence of this labor of love can hardly be overrated. The enthusiasm of a friend or an acquaintance is catching. It is far more convincing than columns of cold type. Doubts are dispelled, objections are quickly overcome and the conviction is reached that ways and means must be carefully studied to settle the question whether a visit is feasible. Questioning concerning some special interests put to the returning traveler often fails to bring satisfactory information and stregthens the belief in the necessity for personal inspection. We may confess that we have been taken by surprise by the unanimity of the enthusiasm aroused with persons differing widely in temperament and in tastes. A good deal of downright wicked work on the part of some of the daily newspapers, notably in the East, is being undone now by those who come home to relate their experience. Whatever may have been the shortcomings during the early days following the opening of the fair, they are now completely removed. The exhibition is a harmonious whole, beautiful beyond anything yet created by man in this country, and in grandeur surpassing any similar attempts at home or abroad. Architecturally and artistically the structures of the White City will prove a revelation and are likely to cause a reaction to a purer and chaster taste in our public buildings and private dwellings. We look forward to as decisive an influence upon the taste of the people as was that created by the Centennial Exhibition. Gaudy frills will not sell as well as they have done, and it will be a wise course on the part of manufacturers of goods ornamented in any way to closely watch developments in this direction.

Increasing Attendance.

Until now the visitors to the fair appear to have been drawn from a moderate distance of Chicago, while the majority of those who have traveled further than 200 miles are well-to-do people. From a study of those in attendance and talks with many people we are convinced that the rush has really not begun yet. That it is coming we have little doubt. Lower rates of fare, the steadily growing interest, and the fact that the vacation season is at hand, will all contribute to swelling the attendance. It is beginning to be understood, too, by the financially timid, that the tales of extortion rest on a very slim foundation. Experts who expect to be overwhelmed with novelties in their own special branch will be doomed to disappointment. Our technical press is too vigilant and too enterprising to permit of many startling revelations. But in these days of specializing, the manufacturer, the business man and the engineer can spend many hours profitably in an inspection of exhibits illustrating recent progress in cognate industries. But after all the main object and the principal achievement, from an educational point of view, of this like every exhibition, is the enlightenment which it brings to the masses, whose range of vision it expands, whose mental activity it stimulates and whose tastes it elevates. The World's Fair, which is Chicago's glory, is becoming the pride of every American, and is bound to have a wonderfully invigorating effect upon the people.

Will Not Give Notes.

A correspondent states a rather novel experience, which, he says, is proving quite a serious matter in some lines of trade. Large manufacturing establishments owe him for supplies. The accounts are overdue, yet he can neither collect the money nor obtain notes, which he might be able to have discounted. He is simply told that he cannot be paid just now and he will have to wait. They never have given any paper out and do not propose to begin now. This is not a solitary case, but has plenty of company. It is a suspension of payments brought about by the scarcity of money and the inability to obtain assistance from banks. These large concerns know they are perfectly solvent, but, as they do not have ready money, they cannot pay their bills and they will not put out evidences of indebtedness which must be promptly met when due. It is a bad condition of affairs, but what can be done to make it better?

Taking Foolish Risks.

The cold storage warehouse at the World's Fair was burned last week, and nearly two score lives were lost merely because a metal thimble had not been put on the smoke stack to prevent it from coming in direct contact with wood. Here was $250,000 worth of property constantly in jeopardy because none of the managers of the warehouse took enough interest in the protection of the property from fire to look after the due completion of the smoke stack. The architect says it was not his fault, because he merely made the plans. The owners say they thought it would do as it was. And yet insurance companies had refused to write policies on the building, because their agents condemned it as too great a risk. One of them said: "It is not even a risk, because it is sure to burn down some time." Under such circumstances it seems almost incredible that owners would themselves take risks refused by insurance companies. The owners were willing to risk all they were worth that a spark would not some time set fire to the surrounding wood work. And yet are not such risks being taken continually by manufacturers and others? They may not be quite so glaring as this seems to have been. We hope that not another case can be found in which sparks are permitted to play directly against wood work. But there are other risks, dangerous to persons and property, which manufacturers are too apt to take. After a serious mishap, when the cause is laid bare, every one will wonder how it could have been overlooked. Yet he himself may be overlooking some very serious risk he is taking at that time. An excess of caution is better than foolish confidence, which is often nothing more than insane recklessness.

Where Is the Point?

BEN BURNT.

The lodge meeting was in session, but as our cigars were not smoked up we were puffing in the anteroom. Bill said things was pretty "middlin'" tough, for bid where you would some "skin" would cut you out. Tom agreed with him, and the whole gang was a "sympathizin'" as though their clothes were sackcloth, and to "mourn with them that mourn" was the fluid extract of earthly joy, when Ephraim Smooth spoke.

"Boys," said he, "let me put a golden stripe on that streak of blue you have been showing, by giving you a pointer. Once there was a fellow who was rich, gosh! but he had the stuff. Well, he had two big jobs to do, and there were lots of fellows who could do them, but only two were asked to bid. They both wanted both jobs, but didn't have sense enough to know that if they got both they would be stuck to get the work done in time, and, consequently, it wasn't likely that either of them would get both. They knew that a certain sum of money had been calculated as about the proper size, but they both bid, and one of them got it at 33⅓ per cent. below the estimated cost. The other fellow howled that it couldn't be done without losing 10 per cent. on what it would cost; and so it went. Well, when the other job was ready, they both bid again, and this time the other fellow got the work at 20 per cent. below the figure the 'stuffed purse' had set. Now, the first fellow said nothing and sawed wood. The other fellow went along with his work according to the patterns sent, and one day he called in his men and told them he was behind time with the job and was about to lose 10 per cent. on the whole job, which was enough to make any one of them rich."

Right there Eph. stopped talkin', and some of the fellows said they didn't see no point. Eph. says:

"You don't, eh! Well, let me illustrate by a further figure of speech. This same Crœsus wanted a lot of other stuff, and three wise men in that land were told about it, but they didn't rush around before day to see what it was. They arrived, however, in due season, and found out what was wanted, and each figured the cost, added on a fair live-well-and-lay-something-by profit, and met the others. John said, 'Boys, I am busy with orders for three months, and this work is wanted now, but I can look sweet and promise nice if necessary.'

"Samuel said: 'I shall be busy longer than that with part of my hands, but not all, though they can help the others out, so I shall be all right.'

"Elias said: 'I am quite busy right now finishing up some orders, but in a month I will be ready for it all.' John and Samuel said 'Git thar, Eli,' and they agreed that Elias should have the job, but he was to pay them a small commission and get what he needed at the start from them at regular rates.

"They knew what 'Gold Grower' had calculated the cost to be, which was $5. So John was to bid $5.30, Sam was to bid $5.15 and Elias just even $5, and all of their bids were sealed and sent in. In a few days 'Amasa Cash' sent for Samuel and said: 'Samuel, I know your reputation and like your goods, but will have to give this work to a lower bidder, unless you are willing to do it at his price.' Samuel looked grave and asked how much too high he was, and he was told just 50 cents. So Samuel said he would consider the matter, but Amasa Cash told him that he had the letter written, to be mailed that day and he could not wait longer than afternoon. Samuel returned in the afternoon, saying that he was very much obliged for the chance to figure again, but he could not take the work any lower, so Elias got the job."

Eph. then asked 'em again, "Do you see the point?" Well, some of them seemed dazed, so he said: "If them first fellows had acted like brothers, as they have good Scripture for doing and had taken what the rich fellow was willing to pay, which you can bet was low enough, they would feel less like you fellows. If you fellows profit by what I have suggested rather than what I have said, there ought to be enough in that profit for a small commission for me." Well the lodge adjourned about then and some of them fellers couldn't sleep that night for thinking.

Effects of Temperature on Canned Foods.

Concerning the keeping qualities of canned foods when exposed to extremes of heat and cold Adjutant-General Williams, in a recent army circular, publishes the following information:

"Apples, peaches, pears, rhubarb, green peas, green corn, onions, potatoes and tomatoes were all subject (at Lady Franklin Bay) to extreme temperatures (over 60 degrees below zero), and were solid for months at a time. The second summer they thawed, the following winter froze solid again. All the articles named presented the same appearance as though freshly canned, and their flavor was as good when the last can was eaten as in the first month. It should be understood that these were first-class canned goods and from dealers of standing and reliability. Cranberry sauce, preserved damsons, preserved peaches, and fruit butters suffered certain changes from candying, &c., which detracted somewhat from their flavor, though not materially so. Dealers in such preserves predicted that such conditions and changes would occur. I had also canned turnips, squash, beets and carrots, as well as pineapples, cherries, grapes, clams, shrimps, and crabs, which, although not subjected to such extreme temperatures as the foregoing, yet froze and thawed repeatedly without injury. No can of any kind except a few, say half a dozen of fruit butters, was ever burst by action of cold or heat."

Dr. Simson Pratt of the British army says:

"Taking my experience in India and the late Nile expedition, in which the test of tinned provisions was exceptionally severe from continued exposure to the powerful direct rays of the sun, I have found that tinned provisions, meat and vegetables put up separately, or combined in the form of soups, are practically undamageable by any climatic heat.

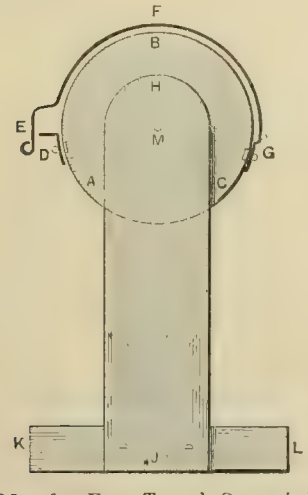
"The only class of provisions that, in my experience, suffers from great heat is that of uncooked articles, such as butter, cheese and some forms of potted meats."

The Trunk Line Association has reduced the fare from New York to Chicago to the price of one limited fare for the round trip. The ticket is good for ten days. Two excursions will be run on Mondays, Tuesdays, Wednesdays and Saturdays of each week, to be alternated by the several lines. On the Pennsylvania and Central the fare will be about $20 for the round trip. On the West Shore and Erie it will be about $18, and on the Ontario & Western, $17.

THE LETTER BOX.

Holder for Eave Trough.

From J. T. S., *Jackson, Ga.*—In answer to the Ohio correspondent who wishes a trough for soldering eave trough in, if he will make a holder as described below there will be no trough required. Make a sheet-iron cylinder, A B C, the diameter of gutter and 4 feet long, or longer if desired. Form a strip of iron the length of cylinder and rivet to same, as shown at D. This forms a straight edge for the bead on trough to rest against. Then form two or more wire springs, as shown by E F G, for holding the trough in position while soldering. These springs are to be hinged to the cylinder as at G, and bent so as to go over the bead and lock over D, as shown at E. The springs are hinged at G, so they can be turned back to release the trough after it has been



Holder for Eave Trough Suggested by "J. T. S" Jackson, Ga.

soldered. Then cut two disks from 1-inch board to fit in the ends of cylinder and which can be secured in place by nailing. In the center of each disk, as at M, drive a wire for the cylider to revolve on. A 6-inch board, K L, for stand, and two 8-inch uprights, similar to H J, complete the machine.

Flat Seams on Large Tin Roofs.

From E. F. B., *Greenville, Pa.*—I would like to have some practical tin roofer tell me through the columns of *The Metal Worker* why large tin roofs with flat seams are, as a general rule, laid with the long seams running crosswise of the roof. Would it not be better to lay the roof with the long seams lengthwise of the building? It seems to me it would give a better opportunity for soaking the solder in the seams if this plan were followed, and the water would run off better.

Protection for Planished Iron.

From R. R., *Coldwater, Mich.*—I would like to be informed through the columns of *The Metal Worker* of some composition for preventing planished iron from rusting.

Answer.—Vaselene is said to be a rust preventive when applied to the surface of iron. If the iron is covered with a thin coating of boiled linseed oil the oil will soon dry and form a coating impervious to moisture, and can be removed with turpentine when required. A cheap varnish can be made by adding 6 ounces of rosin to 1 gallon of gasoline and scraping in a small quantity of paraffine. The following recipe has been recommended for the purpose :

Pulverized alum	4 ounces
Pulverized borax	4 ounces
Pulverized stove polish	4 ounces
Pulverized rosin	6 ounces
Lampblack	2 ounces
Gasoline	1 gallon

In case the above is to be used only for a varnish, the stove polish can be omitted. One ounce of beeswax to 1 pint of gasoline is said to make a good protection for planished iron. We should be pleased to have our readers give any further information on the subject.

Soldering Galvanized-Iron Trough.

From C. B. G., *Bridgeton, N. J.*—In answer to "H. B.," Lebanon, Mo., who inquires in *The Metal Worker* of June 17 regarding a proper way of soldering the perpendicular seams in an old ogee hanging gutter, would say that I have repaired broken seams in deep gutters where it would be difficult to solder with a copper by the following method: The seams are to be well tinned, then take a half tube of galvanized iron, about ⅜ inch in diameter and as long as the gutter is deep. Place this half tube over the seam, holding it close against the trough by means of a cloth of sufficient size. Then take a hot soldering copper and melt the solder into the tube, which will hold the solder against the trough until it cools. The half tube can be left in position or taken off and used for another seam, as may be desired.

Trouble With a Well Cooler.

From E. A. W., *Chester, Vt.*—In reply to the inquiry of "P. R. F.," which appeared in a recent issus of the paper, I would say that if the correspondent will extend his inlet pipe across the boiler to within 2 inches of the opposite end, and do the same thing with the outlet pipe, so that the openings of the two are as far apart as possible, satisfactory results will be obtained.

From R. M. B., *Spencer, Mass.*—I would like to offer a suggestion for remedying the fault in the water cooler referred to on page 33 of *The Metal Worker* of July 8. My suggestion is that if the inlet pipe came in at the bottom and the outlet pipe went out at the top the results would be better for two reasons. In the first place, there must, necessarily, be an air space above the line of the two pipes as the tank now stands, which would lessen the volume of water which the boiler would contain. Thus the 18-gallon boiler would be reduced to, perhaps, 10 gallons. In the second place, where the inlet and outlet pipes are directly opposite, a flow is induced between them, and the water will not circulate throughout the whole boiler.

Barker's Chimney Top.

From Frank Hagerman, *Hanover, Kansas.*—Will some reader of *The Metal Worker* please inform me where I can obtain information about Barker's Chimney Top?

Retinning a Bathtub.

From E. W., *Orange, N. J.*—Please inform me through the columns of *The Metal Worker* how to retin a bathtub.

Answer.—It is supposed that the bathtub in question is lined with tinned copper, and the tin coating has been worn away by use. Under such circumstances it would be necessary to remove the lining before it could be retinned. Such tin as adheres to the copper can be removed by washing with commercial muriatic (hydrochloric) acid, using for the purpose a swab of tow twisted about a stick, to prevent the acid from coming in contact with the hands. The surface is then to be scoured with sharp sand, salt and water, when it can be rinsed with water to see that it is clean. Another method for removing the tin is to take some clay, pound it up fine, and then sprinkle on salt and powdered sal-ammoniac. The above compound is then to be well mixed and moistened with water so as to form a thin paste. The mixture is then spread over the partly-tinned surface of the copper, and then held over a charcoal fire until the copper becomes red hot. If a sufficient amount of salt and sal-ammoniac has been used, the clay will curl up, taking the tin with it. If desired, the strength of the mixture can be first tried on a small piece of tinned copper, if not strong enough to remove the tin, add more salt and sal-ammoniac. The copper is then to be scoured with sand, salt and water. Having cleaned the copper by either of the above methods, it is ready for tinning. A bunch of tow, soldering acid, tin and powdered sal-ammoniac are then to be procured. Brush the surface of the copper over with soldering acid and drop on some pieces of tin. Then place the sheet of copper over a charcoal fire, gas or kerosene stove, until the tin begins to melt. Then dip the bunch of tow into the powdered sal-ammoniac and spread the tin over the surface of the copper. This operation is to be continued until the surface of the copper has been covered with tin. Care is to be taken in the meanwhile that the copper is not overheated, which will cause the tin to look yellow. While the various operations may be performed with skill, it will be difficult to produce results as satisfactory as would be secured by putting in a new bathtub.

PLUMBING and GAS FITTING.

Experiments with Water Traps.

In the *Sanitary Journal* of Glasgow, Scotland, appears an able and interesting paper by Dr. Neil Carmichael, examiner in public health to the faculty of physicians and surgeons of Glasgow, entitled "Plumbing and House Drainage in Relation to Public Health." In this paper Dr. Carmichael gives the account reprinted herewith of some experiments conducted by him to determine the reliability of water traps for preventing the passage of sewer gases and germs from the soil pipe into the house.

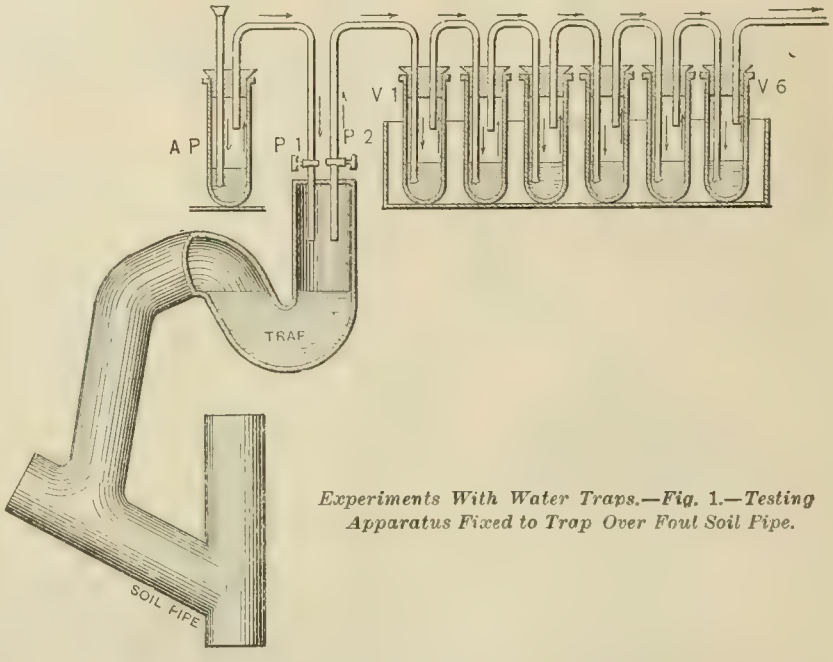
Premising that one of the main objects of good plumbing is to secure the rigid exclusion from our houses of the processes of putrefaction and the products of putrefaction, the author asks: How do the gases and germs contained in soil pipes and drains gain entrance to our houses? Not through solid lead or iron pipes. Gases do pass through these metals, but in quantities so infinitesimal as to be absolutely harmless. Do the gases pass through the seal of the water trap? The late Dr. Andrew Fergus of Glasgow, performed some very interesting experiments with glass tubes formed to represent traps. He found that carbonic acid, sulphureted hydrogen, and ammonia, placed in one limb of the tube, passed through the water in the bend of the tube, and could be detected in the air above the trap on the free side in from 15 minutes to three or four hours. When the tubes were ventilated, the time of transmission was slightly increased. These experiments determined the fact that gases could be dissolved by the water in the trap, and be passed out on the other side. In these experiments, the gases employed were presented to the surface of the water in a very concentrated condition. To what extent do the gases and germs of an ordinary soil pipe pass through the water seal of a sound trap?

GASES DO NOT PASS SOUND TRAP.

To determine this point, says Dr. Carmichael, I performed a series of experiments. The experiments were performed with an ordinary lead trap connected to a soil-pipe. The soil pipe was old; its internal surface was foul; into it there discharged three water closets; it was ventilated above by a 2-inch pipe, and it discharged untrapped into the drain. The lead pipe on the house side of this trap was closed by soldering on to it a plate of zinc, through which passed two small lead pipes into the air cavity above the trap. Air of the room, purified from the gases to be tested for, was, by passing it through an absorbing solution, A P, Fig. 1, drawn continuously by an aspirator through this cavity, and then made to bubble through testing solutions, V1-V6. This was continued for several days at a time, and the experiments were frequently repeated.

It was found that in 24 hours about 7 grains of carbonic acid passed through the trap, when the ventilator on the roof was open, and that when this was closed about 32 grains passed through. Ammonia passed through from the ventilated pipe to the amount of about the two-hundredth of a grain, and, when the ventilator was closed, to the extent of about the hundredth of a grain. The amount of sulphureted hydrogen passing through the trap when ventilated was about the hundredth of a grain, when unventilated it was about one-eightieth of a grain, in 24 hours. Putrid organic vapors, if they passed through, were included in the ammonia, and were never found to come through the trap in such an amount as to be detectable by smell. As the largest amount of ammonia found to pass through was about the one-hundredth of a grain, the putrid organic vapor included in this amount must have been very small indeed.

The quantities of injurious gases and vapors, therefore, which pass through the trap from the soil pipe—even a foul unventilated one, directly connected with the drain—are exceedingly minute, and from a health point of view must be considered absolutely harmless. The foul gases of the soil pipe and drain therefore do not gain entrance to our houses through a sound water trap.



Experiments With Water Traps.—Fig. 1.—Testing Apparatus Fixed to Trap Over Foul Soil Pipe.

PASSAGE OF GERMS FROM SOIL PIPE.

Do the germs of putrefaction or other germs contained in the soil pipe pass through the trap into the house? To determine this point I performed a large number of experiments, a few of which may be briefly described. The lead trap, already mentioned, connected with the soil pipe, and closed on the house side by a plate of zinc

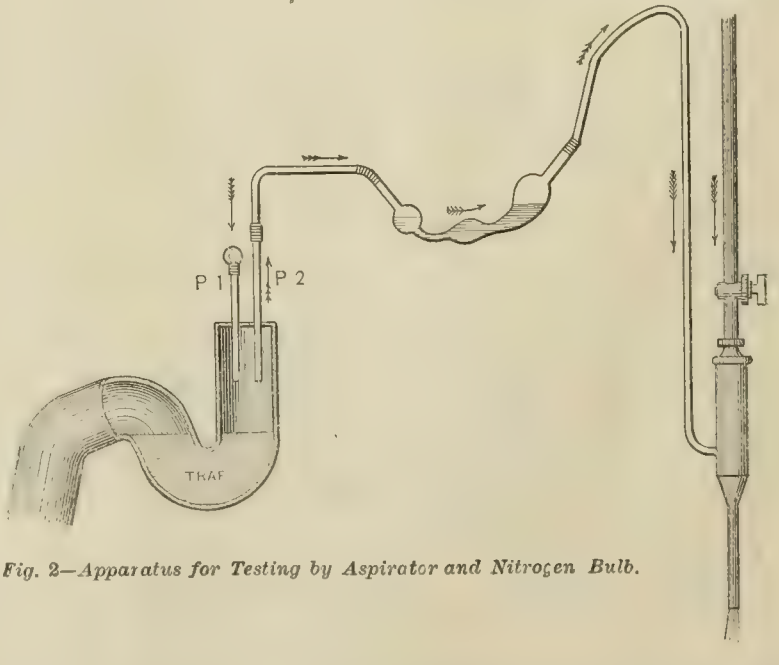


Fig. 2—Apparatus for Testing by Aspirator and Nitrogen Bulb.

having two pipes passing through it into the cavity above the water, was connected, as shown in Fig. 2, by one of the pipes—P 2—with a nitrogen bulb, that is, a glass tube—with alternate contractions and expansions. In this bulb was placed a cultivating solution, that is, an organic solution in which microbes can readily grow when they have been introduced. The bulb was connected with an aspirator, which, when the water was turned on, drew the air through the bulb. The other tube, P 1, leading into the cavity above the traps was at first left open. A pot containing melted paraffin wax was placed under the lead trap, so as to immerse the trap in the wax. This was heated until the water in the trap boiled freely and steam was blowing out freely through the open pipe, P 1. The liquid in the bulb also was boiled. This boiling killed all germs which were contained in the trap and in the bulb—it sterilized the apparatus. A large pad of sterilized cotton wool was placed over the mouth of the pipe, P 1, from which the steam was escaping, and the heat was then removed.

When the trap had cooled the aspirator was started in action by turning

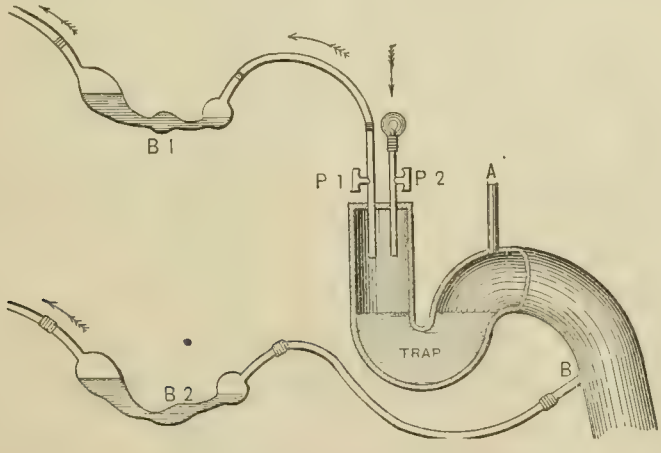


Fig. 3.—Tests of Air Direct from Soil Pipe.

on the water. The air of the room, filtered of its germs by passing through the cotton wool, entered the cavity above the trap, mixed there with the gases and air contained in it, and was then drawn in a series of bubbles through the liquid in the bulb. If any germs pass through the water trap from the soil pipe they must have been carried into the bulb.

The aspiration was usually continued for from 24 to 36 hours. The bulb was hermetically sealed before removal and was placed in a room heated to cultivating temperature. The liquids in those bulbs, though kept for several months in some instances and at cultivation temperature, remained perfectly clear, and exhibited, on careful microscopical examination, no trace of life; that is to say, no germs had passed through the water trap. For comparison, the air of the soil pipe was made to bubble directly through a similar bulb, B 2, Fig. 3. The liquid in this case, became hazy from particles, and developed fungi and bacteria in abundance.

GERMS FROM PUTRID LIQUID IN TRAP.

It might be objected, to the experiment with the trap just described, that the water contained in this trap was sterilized, and that the water ordinarily found in a trap is more or less putrid. Would putrid liquid give off its germs to the air above it? To determine this I poured into the trap already mentioned, through a pipe, A, Fig. 3, on the soil-pipe side of it, about a pint of urine. A portion of this remained in the trap, mixed with the water previously contained. This speedily putrefied. Aspiration of the air above this trap through the cultivating liquid in the bulb was continued for a week. The liquid in the bulb did not putrefy nor develop life—that is, the putrid water in the trap did not give off its germs to the air above it.

These results are in entire consonance with the results obtained by many other modes of experiment. Sound water traps, properly placed and having a proper seal or water lock, are therefore, for the exclusion from houses of injurious substances contained in the soil pipe, perfectly trustworthy. They exclude the soil-pipe atmosphere to such an extent that what escapes through the water is so little in amount and so purified by filtration as to be perfectly harmless, and they exclude entirely all germs and particles, including, without doubt, the specific germs or *contagia* of disease.

DESTRUCTION OF SEAL BY SYPHONAGE.

Yet there are conditions under which traps may fail to protect. They may be so placed that the water seal is destroyed. The water in the trap may be syphoned or aspirated out till the seal is destroyed. Expansion of the atmosphere in an unventilated soil pipe may cause the soil-pipe air to bubble through the trap. To determine the condition of the air which bubbled through the trap the following experiment was performed: With the apparatus arranged as before, except that the pipe, P 2, Fig. 3, through which the air had previously entered was now closed, the aspiration was started, and air not being obtained through the small pipe, the soil-pipe air bubbled through the trap. The liquid in the bulb in this case became hazy and developed bacteria and mold. Soil-pipe air bubbling through the trap carries with it the germs, and if this soil-pipe air contained the germs of specific diseases, these would doubtless be conveyed to the atmosphere of the house.

These experiments establish the reliability of the water trap, if sound and well placed, and emphasize the importance of ventilation of the soil pipe, and of so arranging the pipes that pressure and syphoning may be avoided.

THE MOSELY FOLDING BATH TUB COMPANY, 181 South Canal street, Chicago, have the past week shipped 50 of their outfits to the Union Nut Company, one of the largest export houses in New York, as a result of their critical and expert examination into the merits of these goods, which are fast growing in public favor. The Union Nut Company propose to push the sale of the Mosely outfits with their extended South American connections, and predict large developments. The Mosely Folding Bath Tub Company have made application for patents in many foreign countries, some of which have been granted, and they believe that all applied for will in due time be obtained. The company have every reason to be pleased with the condition of business, considering the unsatisfactory state of the country generally, their trade being good, with orders waiting to be filled.

Colonel Richard T Auchmuty.

Many readers of *The Metal Worker* will learn with unfeigned sorrow of the unexpected death of Colonel Richard T. Auchmuty, the founder of the New York Trade School, which took place at his summer home in Lenox, Mass., on Tuesday, July 18. The immediate cause of death was œdema, or dropsy of the lungs. The Colonel sustained a severe injury to one of his legs during the war, from which he suffered more or less for many years. Last March the limb was amputated, and Col. Auchmuty was believed to be regaining strength after the operation. He was able to be moved about in his chair until last week, when a collapse set in and he sank rapidly.

Richard Tylden Auchmuty was born in New York City in 1831, and was a member of an old New York family that emigrated to this country from Scotland early in the last century. His great-grandfather, the Rev. Dr. Samuel Auchmuty, became rector of Trinity Church in 1763. After graduating from college, Colonel Auchmuty studied architecture with James Renwick, whose partner he subsequently became. He was appointed Assistant Adjutant-General of Volunteers at the outbreak of the war, and served during the years 1862 and 1863 in the Army of the Potomac. Ill-health compelled him to apply for relief from active duty in the field, and he received orders in 1864 to report for duty in Washington. He remained in the War Department until the close of the war, with the added rank of Major. While still quite young Colonel Auchmuty married Miss Ellen Schermerhorn of the well-known New York family. Miss Schermerhorn was the daughter of the late P. A. Schermerhorn, and she survives her husband. The fortune brought him by his wife, added to his own, enabled him to retire from active business life and devote his time and energies to philanthropic pursuits. Colonel and Mrs. Auchmuty had no children, and spent large sums in unostentatious charity.

Colonel Auchmuty will be best remembered as the founder and promoter of the New York Trade School, to the interests of which he devoted the best energies of his life for the past twelve years. This institution was established by him in 1881, after considerable study of the subject of manual training as conducted in Europe. About $50,000 were originally laid out in land and buildings. Although meeting with many discouragements and obstacles at first, the Colonel labored indomitably with tongue, pen and purse for years until success came, and his project and the system of manual training devised by him blossomed into the widely known and successful establishment which now serves as a model for all similar enterprises throughout the country. Last year the school was incorporated and Colonel Auchmuty and his wife, in addition to the previous gifts, presented the sum of $100,000, J. Pierpont Morgan at the same time donating $500,000; so that the institution now stands on a firm basis, and will endure as a noble memorial of its founder and benefactor. "The Colonel," as he was

always called by the students, worked hard in the management of the school, which he was accustomed to visit almost daily, talking to his "boys," imparting kindly advice, and receiving their confidence and affection in exchange. Singularly winning in manner, with a kindly tact and generous, broad mind, all who came in contact with him formed a respect and admiration for the man; and many a youth has testified to the benefit which the colonel's personal influence worked on his life. Colonel Auchmuty also assisted materially in founding the mechanical trade schools of the Builders' Exchange in Philadelphia, to which he contributed $3000 a year for the first three years of its existence. Often urged by his friends to stand for public office, he always declined on the plea that his time was too fully occupied in the management of his beloved trade school. Colonel Auchmuty was a vestryman of Trinity Church, New York, and a trustee of the Cathedral of St. John the Divine, and was active in many good works in this city and in his summer home at Lenox. Always modest and retiring, he was little seen in fashionable gatherings, but among "his boys" he found his truest happiness.

The following editorial notice of the late Colonel Auchmuty appeared in the New York *Evening Post* of July 19:

In the death of Col. Richard T. Auchmuty this city loses a model citizen and the nation a benefactor. He was of such unfailing modesty, his work was performed always with such studied avoidance of all ostentation, that few persons except those within the immediate circle of its influence had much knowledge of its vast importance. Yet he was one of the most potent agencies for good in his time, and he has left behind him, thoroughly established on a strong and lasting foundation, a system of instruction for American youth which is destined as the years go by to spread over the whole country and to become of incalculable benefit to all the people. This is not the extravagant language of unrestrained eulogy, but the simple statement of the truth.

Soon after the close of the war, in which Colonel Auchmuty had performed meritorious service, he began as an architect to consider the question of technical or trade education in this country. He saw that the labor field in the United States was coming every year more completely into the possession of foreign laborers, who were getting control of all the trade unions and were using their power to exclude American-born boys from the labor field. Year by year the trade union regulations in regard to apprentices became more and more stringent, until they practically excluded American boys from the trades. At the same time, foreign workmen were admitted freely to all the trade unions, without much regard to their proficiency and with no regard to their character. The more Colonel Auchmuty studied this situation, the more profoundly was he impressed with the grave peril which it involved for the American people. He saw American boys growing up in idleness, their lives ending in crime and pauperism. At the same time he saw our labor field passing into the control of turbulent foreign elements, some of them even anarchistic in their tendencies, and the great majority of them without either knowledge of or sympathy for American institutions or social laws. Sooner than any other man of his time, perhaps, Colonel Auchmuty saw the peril which lay in this condition of affairs. We were neglecting to train citizens of the most desirable class in any nation—that is, self-respecting, honest, industrious workingmen, and in their places were admitting hordes of foreigners, all of whom were from the nature of the case destitute of the instinct of patriotism, and many of whom scorned the idea of cultivating it by adoption.

His intimate friends alone know how deeply a sense of the dangers lurking in these conditions sunk into Colonel Auchmuty's mind. He studied into the trade question in other countries, and saw that in all the nations of Europe there had been a somewhat similar problem presented and solved. There, as in the United States, the old apprentice system had passed away, the cause being the same everywhere. These were mainly the subdivision of labor brought about by the introduction of machinery, and changed social conditions under which a taint of servility had come to be attached to the apprentice relation. A boy could no longer be taken in a trade and taught the whole of it, for the foreman or master mechanic in most cases had supervision of only a single branch of it. European nations met the new situation by establishing technical or trade schools. They began to do this early in the present century, Germany, Russia, Belgium and Switzerland leading the way. France came early into the field, and England soon after her. To-day every nation of Europe has a system of trade schools. In Germany and France some other technical education is compulsory and a child is put through a regular system of technical instruction which culminates in the perfect trade school, whose graduates command journeymen's wages immediately upon graduation.

Colonel Auchmuty saw that we must, like Europe, find our remedy through education, but that we could not do this, as most European nations had done it, by means of State aid. We must do it with private funds, and he was always confident that by doing it in this way we should command the best results. He accordingly set the example, but without a particle of noise, by establishing his New York Trade Schools in 1881. He did this with his own money. From small beginnings they grew until he had invested $70,000 in them, and he and his wife had given in addition $160,000 as an endowment fund. During the first year he had 30 pupils, during the second 98, during the third 207, and so on by steady increase till at present the graduates number over 600 a year. The boys come to the schools from all parts of the United States and Canada. Practical instruction in various trades, such as plumbing, plastering, stone cutting, painting, bricklaying, carpentering and printing, is given by master mechanics and other competent teachers, and the instruction is accompanied when necessary by the study of technical books and trade papers. The end sought is "to enable young men to learn the science and practice of certain trades thoroughly, expeditiously and economically, leaving speed of execution to be acquired at real work after leaving the school."

From the outset Colonel Auchmuty met with the opposition and ill will of the trade unions. They would not admit his graduates, and they boycotted them when they tried to work without union cards. Then he, as an architect, put up blocks of houses to give the boys a chance to show what they could do, and some of the finest specimens of good workmanship in the way of building are to be seen in apartment houses and other structures which he had built in this way. After a time some of the trades unions treated his graduates better, but the great bulk of them remain hostile to this day. The Colonel was never weary of talking of his "lads," of showing the photographs of the members of his graduating classes, who, he said, with entire truth, compared favorably in appearance with the graduates of our colleges. They are a broad-browed, manly-looking set of young men, who are the kind of citizens every country ought to develop by every means in its power.

About a year ago, Colonel Auchmuty's schools were put forever beyond the experimental stage by a munificent endowment fund of $500,000, presented to them by Mr. Pierpont Morgan. The colonel felt then that the success of his work was assured. He had been laboring quietly with his voice and pen, and the good example he had set here had begun to find imitators in other cities. Soon after this his last and most painful illness fell upon him, and though he was hopeful till the end, he was not sanguine of recovery. He said frequently during the weary months in which he was shut up at home and unable to go to his beloved schools, that he was in one sense grateful for his affliction, for it had shown him that his schools would go on perfectly well without him, and consequently would continue after his course was run.

So they will, and so will the noble and inspiring lesson in civic duty, in what Mr. Bryce calls "home patriotism," continue for many years to come. Colonel Auchmuty has sown the seed for a new generation of American workingmen, who are proud of their calling because masters of its technique, and who go abroad in the world as living exponents of the dignity of labor. These are the citizens the country needs in many ways, but in none more than in their ability to undermine and destroy the pestiferous and degrading domination of the latter-day labor apostles who are a libel upon honest workingmen everywhere. It is because Colonel Auchmuty has, as we firmly believe, laid the foundation for this great reform that we hail him as a national benefactor.

Peck Bros. & Co.

The house of Peck Bros & Co., with general office and factory at 125–137 Chestnut street, New Haven, Conn., and with showrooms in New York, Boston and Chicago, have issued a catalogue of plumbing and sanitary work which will take a high rank among the trade publications of the day. The volume, which was compiled by W. E. Hinsdale, consists of nearly 600 pages, 9½ x 12 inches in size, and is bound in stiff board covers with a gilt side title upon a black ground. The latter includes the name of the company, the date and an indication of the business in which the company are engaged. A feature of the publication which will be appreciated by the trade is a back title in plain gilt letters, consisting of the firm name. The opening pages are devoted to views of the works at New Haven and of the sales and showrooms at New York and Chicago. In compiling the volume it has been the aim to illustrate a line of sanitary fixtures adapted to meet the needs of advanced plumbing and the requirements of the plumbing ordinances enforced in many cities, as well as the varying tastes of the public, in the ornamental fixtures shown. In offering it to the trade

Messrs. Peck Bros. & Co. request architects specifying or plumbers ordering any of their goods, to use numbers designating the illustrations, and if it is desired to use any fixtures other than those shown in the complete article to employ the designating number of such fixture in connection with the main fixture specified. An alphabetical index occupies ten pages, following which is a telegraphic code for ordering goods by wire. The illustrations cover an almost endless assortment of sanitary fixtures, including lavatories, basin cocks, bibbs, brass fittings, couplings, elbows, hydrants, kitchen sinks, nozzles, nipples, plugs, porcelain goods, pumps, radiator valves, range boilers, reducers, sanitary earthenware, saws, screws, steam cocks, cast iron fittings, street washers, stops, tanks, tees, traps, water-closets and tanks, steel range boilers, wrenches, wrought iron pipe, couplings, &c. A very handsome feature of the publication is a number of pages showing a variety of decorations of closets, both on plain and on embossed bodies. These designs are carefully printed in a way to show the closets as they actually appear, the decorative features being worked out in an artistic manner. The same may be said of decorated basin cocks and of decorated basins, of which many designs are shown. The catalogue carries, in addition to the illustrations, brief descriptive particulars as well as numbers and prices. Its general make-up shows evidence of careful attention to details and due consideration of the requirements of the trade. The publication is highly creditable of the house issuing it, and we have no doubt that every one into whose hands a copy may come will duly appreciate it.

The Education of the Craft.*

The subject allotted to the delegates from the city of Los Angeles, Cal., through the kindness of your Essay Committee, is one which demands the attention of every master plumber in the world; for upon "the education of the craft" depends almost entirely the future prosperity and status of sanitary science.

It is a recognized fact that the National Association of Master Plumbers should enforce an apprentice system, whereby the apprentice would be enabled to educate himself in the art of plumbing. It should be the duty of this association to inaugurate technical schools for the art of plumbing in all the larger cities, and encourage the use of periodicals and standard works on the same, for the education and benefit of the craft.

To the masters I would say, be more particular in selecting your boys. Insist upon it that they be respectably connected. They should have a good common school education, be possessed of a mechanical turn of mind, combined with good reasoning faculties, as well as a spirit of independence that will at all times enable them to act for themselves. They should have a good physical constitution and be prepared to serve a regular apprenticeship for five years. Their moral qualifications must also be of the highest order.

After having decided upon an apprentice system, each local Master Plumbers' Association should appoint a committee for their examination semi-annually, and great care should be taken to invite apprentices from surrounding villages to these examinations, which should determine their qualifications. The committees should compile their own list of questions, as climatic differences affect the art of plumbing.

The journeyman's qualifications should comprise a correct knowledge of the laws of governing the motion and action of the various substances, both fluid and solid. This renders a knowledge of hydraulics, hydrostatics and kindred subjects quite indispensable. The knowledge of drawing will also be found of great service. The journeyman should be more friendly to the apprentice. The existing ill feeling is degrading to the business. By treating him in such a manner he will not only raise the standing of himself and his trade in the opinion of the public, but make it more valuable from a selfish point of view.

The journeyman, after having received his diploma, should practice the art of plumbing for a period of one year, when, if desirable to him, he should be entitled to an examination as a master plumber. This examination to determine his qualifications should be held annually by examiners appointed by the Federal Government, and balloted for by the National Association of Master Plumbers at their convention held in the year preceding presidential election, and should hold office for a period of four years. No one should be eligible unless he had served at least five years aside from his apprenticeship. A bill to this effect should be presented to the next Congress, as it is a national question and should be dealt with accordingly.

While State and city laws have done much good, we all know that health commissions of this kind are usually manipulated by the wire-pullers, and men who have absolutely no ability receive the appointments. The result is that the responsibility of the sanitary condition of the world depends entirely upon the plumbers. Therefore, gentlemen, I ask you why we should not have credit for what we know, and why are we not entitled to a national law for examination and registration of master plumbers, showing that educated master plumbers are the responsible sanitary engineers of the day? If each member of this convention will consider himself a committee of one to secure the passage of such a law, we will accomplish more for the education of the craft than in any other manner.

* Submitted by the Los Angeles Local Association at the Milwaukee Convention of the National Association of Master Plumbers, June 13-16, 1893.

THE VIRGINIA PLUMBING AND HEATING COMPANY have been incorporated at Richmond, Va., to manufacture and deal in heating and plumbing materials. G. W. Priddy is president; C. E. Bare, vice-president; and C. A. Huffmann, secretary and treasurer.

Straits Tin.

The store of tin in the mines of the Straits is said to be practically inexhaustible. A recent report from that district says that, in the opinion of practical men, these mines have been only superficially prospected so far. As more than half the tin supply of the world is obtained from the Straits, scarcity of the metal need not then be feared. The output of the mines has steadily increased of late years, and the increase is likely to continne. The folfowing figures show the exports in tons:

1887	27,549
1888	29,169
1889	33,021
1890	31,976
1891	36,061

For the years 1890 and 1891 the principal shipments from the Straits, by countries, were as follows, the picul being 133⅓ pounds:

	1890. Piculs.	1891. Piculs.
United Kingdom	267,238	293,024
Austria	5,295	4,035
France	40,935	45,446
Germany	2,102	2,532
Holland	14,304	18,355
Italy	3,698	6,676
United States	118,243	1683,647

These figures show a marked increase in the shipments to the United States, which may be attributed to the establishment of the tin-plate industry in this country during the latter half of 1891.

SCRAP.

IN A CIRCULAR recently issued the St. Louis Stamping Company, St. Louis, Mo., call atttention to their American tin and terne plates, which they claim to be, in toughness and softness, fully equal, if not superior, to the imported article. All the tin plates made by the firm are guaranteed to stand double seaming without breaking.

THE LONG-CONTINUED DROUGHT in Britain is being felt at the Welsh tin-plate works, several of which have been obliged to partially suspend operations for lack of water.

AT THE PONTARDAWE TIN PLATE WORKS of W. Gilbertson & Co., near Swansea, Wales, a strike has occurred among the whole of the tin house men. The dispute at the Carmarthen Tin Plate Works appears to be still unsettled, and the men remain out. The burning question is the infliction of fines for breakages.

A NEW TIN-PLATE WORKS of ten mills is to be erected at Kidwelly, Wales.

THE TIN-PLATE MARKET is reported as still very quiet in England, American orders being light, owing to caution in the purchase of stocks, while the action of Congress in respect to the Tariff remains doubtful.

TIN PLATE WORKS are in operation at Piombino, Italy. The labor is mainly supplied by Welshmen.

THE CHICAGO TIN PLATE COMPANY of Chicago were recently incorporated with a capital stock of $25,000 for the manufacture of iron and steel sheets and tin and terne plates. The incorporators are J. C. Benton, C. D. Miller and N. D. Lewis.

C. R. BRITTON of the Cleveland Tin Plate Company has taken charge of the tin and terne exhibit at the World's Fair for a few weeks.

RITER BROS. & Co., Philadelphia, will be found out among the trade now that the patriotic tinner has resumed labor after his celebration. The demand for their varied brands of tin and terne plates has been satisfactory during the early part of the year.

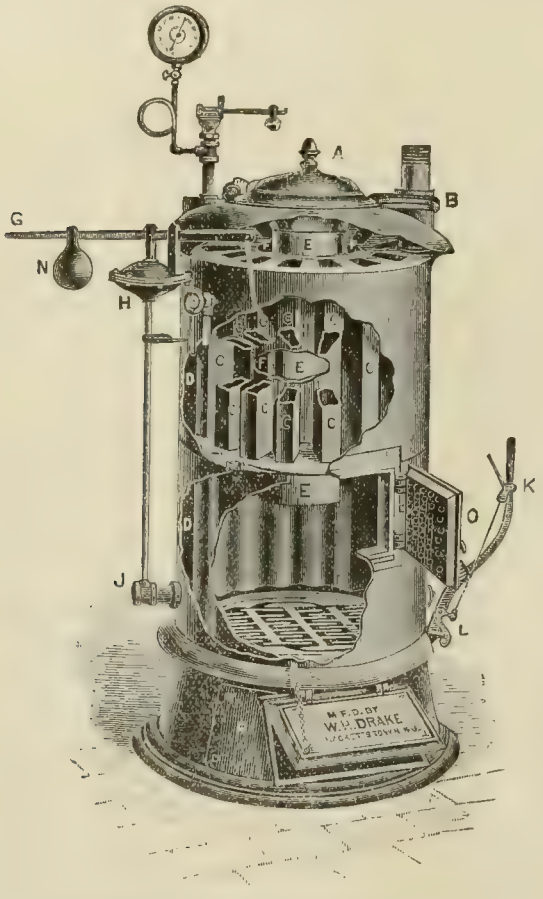
Much damage has been done and much suffering caused by the recent droughts in Germany. The peasantry have lost most of their young crop and the scarcity of fodder is becoming a national calamity. Cereals have been purchased with State funds to aid peasants and feed their cattle.

Experiments are shortly to be carried out by the Navy Department to determine the best colors to paint war ships in order to make them as difficult as possible to sight at sea.

STEAM AND HOT WATER.

The Torrid Steam Heater.

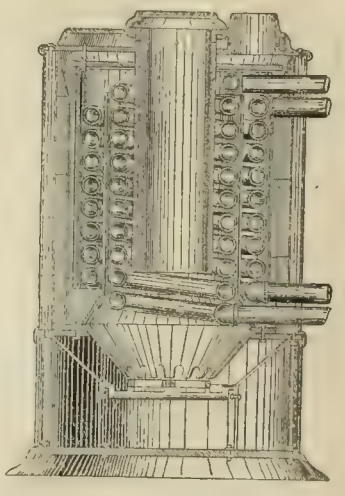
W. H. Drake of Hackettstown, N. J., is offering the trade a steam heater known as the "Torrid," and which is represented in sectional view in the accompanying engraving. The heater, which is entirely of cast iron, is made in two sections, the lower forming the fire box, while the upper has the flues cast in one and the same piece with the shell and the heads. The flues are upright, leaving no place, the manufacturer states, for the accumulation of dust and ashes, and also are absolutely without joints. The sections are placed one above the other, and in this position holes through which the water and steam pass from the lower to the upper sections are reamed and tapped, while a hydralic nipple is firmly screwed into the openings, thus making a perfectly tight joint. As the weight of the upper section rests on the lower section, the nipple connections are free from strain. In offering this heater to the trade the manufacturer refers to its durability and economy, as well as its ease of management and handling. It has rocking and dumping grate, is tested to 200 pounds and occupies comparatively little space in the cellar, or wherever it may be placed. Referring to the sectional view presented herewith A is the swing cover under which the coal is placed in the feeder; B is the hinge of the swing cover around the main steam pipe; C C C are upright flues around which the water circulates; D is the water space; E the magazine; F the fire flue around the magazine; G the lever for damper regulator; H the damper regulator; J the main return pipe; K the rocking lever and latch lever; L the latch to hold the grate bars in position; N the weight to regulate the draft; O the front feed door, and P the removable section on the base to admit the grate. The Torrid is adapted for steam or hot water, and is now made in six sizes, having grates measuring from 9 to 21 inches in diameter, and adapted to supply steam for 100 to 1000 feet of radiating surface. A special feature of the heater is the regular upright tubular boiler, combining the advantages of the ordinary wrought iron tubular boiler with those of cast iron for heating purposes. All sizes are made direct draft and return flues. In the latter the products of combustion after passing up through the tubes are carried down around the outside of the boiler, thus utilizing to the fullest extent the heat generated in the fire box. The return flue heaters may be readily converted into direct draft by turning a single damper. All sizes are made so that they can be used either with magazine, self-feed or as surface burners.



Broken View of the Torrid Steam Heater.

The Gurnee Hot Water Heater.

P. J. Gurnee, Kingston, N. Y., is making an improved hot water heater especially adapted for use in connection with dwellings, churches, greenhouses, &c., and which is shown in vertical sectional view in the accompanying engraving. This heater consists of two steel cylinders, one within the other, while the space between the two is filled with a non-conducting material. Within the inner cylinder is a fire pot which, with its connecting self-feeding coal magazine, has a capacity of burning many hours without attention. In this apparatus the water is heated in coils of steel pipe, placed within the inner cylinder, the pipes employed for connection with the radiators being about the same size as those in the heater. This arrangement, the manufacturer states, gives a free circulation of the water. The coils are placed directly over the fire pot, and the water being confined in a small space rapidly becomes heated and immediately establishes a circulation. The maker states that with this heater the fire may be crowded as much as desired from the very start, without danger of cracking or explosion. In offering this heater to the trade Mr. Gurnee refers especially to several points, among which may be mentioned durability, safety, portability, ease of management and also to the fact that the heater can be placed in a basement dining room and when bronzed is as ornamental as a stove.



Sectional View of Gurnee Hot Water Heater.

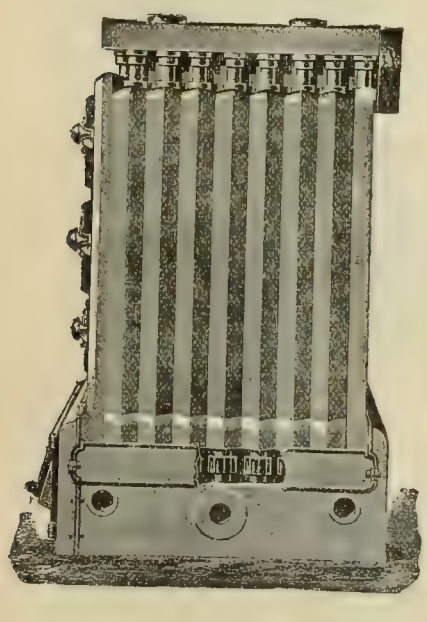
The Gurnee heater is made in four sizes, with fire pot from 16 to 28 inches and heating capacity from 12,000 to 60,000 cubic feet.

Geo. B. Cobb & Co., New York and Philadelphia, have just issued a neat pamphlet of the "Florida system" of heating, containing a number of half-tone engravings of handsome residences, flats, churches, hotels and office buildings in which their system has been used. It treats briefly of the different artificial heating methods, recommend-

ing steam and hot water, the installation of such plants being their specialty. The advantages of their system and the different kinds of radiation are explained, while numerous testimonials show the satisfaction their goods have given.

Capitol Hot-Water Heater.

The accompanying engraving shows the 1893 pattern of the Capitol hot-water heater, manufactured by the United States Heater Company, Detroit, Mich. No change in the main features of construction have been found necessary, as the record of the heater for efficiency during the severe weather of last winter is said to have been all that could be desired. The grate and the shaking arrangement have, however, been improved, and the fastenings of all the doors changed. In the new pattern there is sufficient space between the front of the heater and the next intermediate section to permit soot and ashes, when brushed from the inner surfaces, to fall into the fire pot, thus preventing their escape into the cellar. As shown by the side view, the smoke pipe will here-



Side View of 1893 *Pattern of Capitol Heater.*

after be taken out at the rear of the heater instead of extending up above the top, thus permitting the heater to be placed in lower cellars than was formerly possible. The side plate, which formerly covered the top connections, will now be inside of those connections, so that they will not be exposed to the heat of the fire. These little points, while not affecting the general operation of the heater, are designed for the convenience of the fitter, and as such will no doubt be appreciated.

Heating and Ventilation of the Imperial Institute, London.

The heating and ventilation of the newly-inaugurated Imperial Institute in London is said to be carried out on the most improved modern principles. The general arrangements are thus described by an English exchange:

Nearly the whole of the basement area of the front building is formed into air chambers under the basement floor, with a sub-basement corridor running the whole length, and fresh air is brought into these chambers from the outside atmosphere at 32 different places, where it is filtered and moistened by passing through a water spray. In the winter it is warmed in its passage over a series of gilled steam pipes, and thence conducted to the various rooms in vertical ducts, discharging itself through air valves in the chimney breasts controlled by regulators.

The whole of the warming is by steam, and the mains to the various heating chambers are carried in the subway, where they are fitted with control cocks to each several section under the immediate supervision of the engineer, enabling him readily to regulate the amount of heat without the necessity of going into the building. The fresh air admission valves are also worked from the subway, by which the quantity of fresh air which is admitted can also be regulated. The whole of the corridors and galleries are warmed by steam radiators, provided with fresh air ventilating tubes through each pipe, and having fresh air admitted to the bases from the outside atmosphere.

The vitiated air is taken from every room and corridor by means of extraction shafts built in the walls, and fitted in the room with self-acting floating valves. The whole of these shafts are connected into four main trunks or ducts in the roof, and are carried to the center tower, where they discharge into the open air. To facilitate the extraction of this vitiated air a pair of engines with a compressed air plant and receiver is fixed in the general engine house, and the compressed air is taken to the roof and coupled up to the main trunks in several places, and the end of the pipes fitted with gun metal nozzles for inducing a rapid outflow of the atmosphere of the rooms into the outer air and cause a constant renewal of the fresh air passing through the various rooms, warmed in the winter and cooled and moistened in the summer.

HEATING NOTES.

George H. Reynolds, secretary of the Master Steam and Hot-Water Fitters' Association of the United States, announces that the headquarters for the ensuing year will be at Room No. 625 Metropolitan Life Insurance Building, Madison avenue and Twenty-third street, New York City.

Sealed proposals will be received at the office of the Supervising Architect at Washington, D. C., until July 27 for all the labor and materials required for repairs to the heating apparatus of the United States Treasury Department Building, Photograph Gallery of the Treasury Department and the Winder Building at Washington, D. C., in accordance with the specification, copies of which may be had from the office of the Supervising Architect.

The Richmond steam and hot-water heaters are considered in a little pamphlet which has been issued by the Richmond Stove Company of Norwich, Conn. The merits of these goods are clearly set forth, while a long list of testimonial letters show the favor with which they have been received by the trade.

The American Boiler Company of Chicago, Boston, New York, Denver, San Francisco and Portland, Ore., are distributing a very neat advertising device in the form of a postal card with a small United States mail box attached to its back, part of the usual lamp post being seen above and below. In the mail box is a circular entitled "Use the Mails." The suggestion is made to the trade that this is the time to distribute circulars and catalogues among prospective customers. The company will be pleased to provide catalogues to those who desire them for this purpose.

The Fowler Radiator Company, 435 N. Broad street, Philadelphia, Pa., are sending out a sheet of the Fowler radiators. The features of the goods are clearly set forth, the Fowler complete semi-direct radiator being the leader.

The Bennet & Peck Heating and Ventilating Company, Cincinnati, Ohio, are installing a complete system of heating and ventilating in a new school building at Sewickley, Pa., which embraces all of the latest ideas in the art.

The Boland Trade Schools.

The new building which is to house the trade schools connected with the Roman Catholic Orphan Asylum on Madison avenue, between Fifty first and Fifty-second streets, New York, is now approaching completion, and it is expected that it will be ready for occupation by September 1. The building is a handsome structure, occupying a space of 200 feet by 56 feet, and is constructed of red brick with brown stone facings. It comprises three stories and a basement, the latter devoted to the class rooms for manual instruction, and the upper floors to the accommodation of the pupils, all of whom will live on the premises. It is calculated for the training of 100 to 150 boys, and all the mechanical trades usually taught in such schools will be represented in the curriculum. It is proposed to copy closely the Auchmuty system of instruction as conducted in the New York Trade School. Plumbing, carpentry, painting, plastering, machine work, bricklaying, and other trades are being arranged for, the instructors for which will be drawn from the trades in the city.

These schools are the outcome of a bequest of $50,000 left some twenty-five years ago by William Boland of New York for the establishment of a school for manual training of the older boys in the R. C. Orphan Asylum. The money was applied to the purchase of a farm at Peekskill, N. Y., where manual training has been given to the lads under the superintendence of the Christian brothers; but it has been found to be too remote from the city and too expensive to maintain. Consequently the present building has been provided at a cost of about $200,000. The boys will be taken from among the older lads of the orphan asylum, and they will be trained for manual trades, which they may eventually become perfected in by a course at some more advanced trade school.

A novel case has been taken to court by the people of Ironwood, Mich. The engineer in charge of the water works permitted dead fish, birds and other matter to putrefy at the bottom of the stand pipe through which the water for the city is pumped. An epidemic of typhoid fever resulted. The city now proposes to ascertain the legal responsibility of the engineer for the consequences of his neglect of duty.

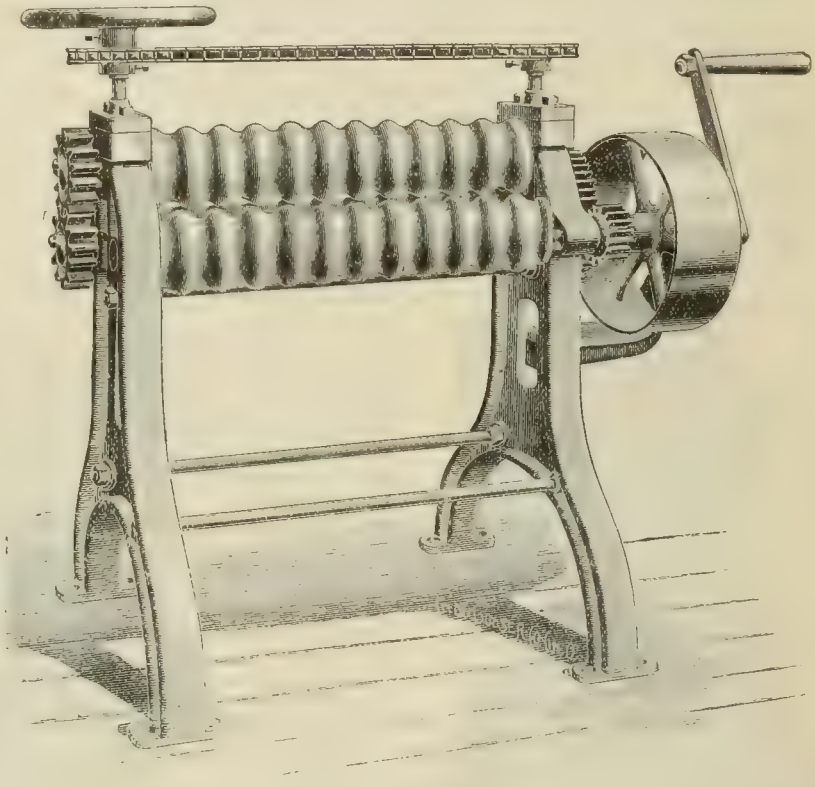
ROOFING AND CORNICE.

National Iron Roofing Association.

According to previous announcement made in these columns, the semi-annual meeting of the National Iron Roofing Association was held at the Hotel Plaza, Piqua, Ohio, on Tuesday, the 18th inst. Among the concerns represented were: S. D. Hicks & Son, Boston, Mass.; Kanneberg Roofing Company, Canton, Ohio; J. H. Eller & Co., Canton, Ohio; Canton Steel Roofing Company, Canton, Ohio; Garry Iron & Steel Roofing Company, Cleveland, Ohio; Standard Iron Company, Bridgeport, Ohio; Wheeling Corrugating Company, Wheeling, W. Va.; American Roofing Company, St. Louis, Mo.; Cincinnati Corrugating Company, Piqua, Ohio; James A. Miller & Brother of Chicago and W. G. Hyndman & Co. of Cincinnati, Ohio. The proceedings were conducted with James Hicks of S. D. Hicks & Son in the chair. The time was largely occupied in adapting the weights on painted and galvanized roofing to conform to the new United States standard gauge. While the members of the association were in Piqua they were handsomely entertained by the Cincinnati Corrugating Company and by the citizens of the place named, a banquet being one of the prominent features.

New Curving Machine.

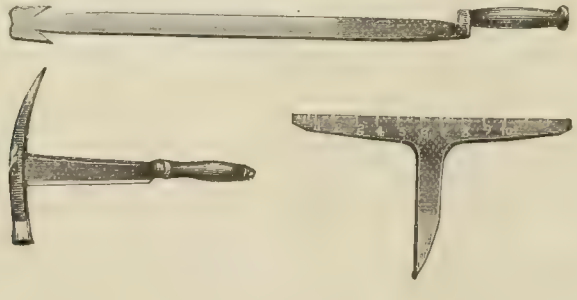
In the accompanying illustration we present a general view of new and improved curving rolls, which have been brought out by J. M. Robinson & Co. of Cincinnati, Ohio. The machine having been especially designed for arching, curving and forming corrugated sheet metal. The rolls may be operated by steam or hand power according to convenience. Special reference is made by the manufacturers to the fact that while the rolls are in motion and a sheet of metal between them they may be reversed, thus continuing the travel, back and forth, of the corrugated sheet in the process of being formed, and this operation may be carried on until the required formation is secured. This feature is considered of great importance by the manufacturers, as it results in the saving of time and insures the perfect forming of the work in hand. The machine is composed of three grooved rolls, two being at the bottom and one at the top. The bottom rolls are made on a horizontal line, running parallel, and the sides touching. The center line of the top or forming roll is directly over the point of contact of the two bottom rolls, all of which are properly geared together, so that power applied to the crank or pulley will set all in motion. The position of the top or forming roll, the manufacturers state, permits the forming of arches of small radii up to the largest required for work in general. The movement of the top or forming roll for graduating the radii is accomplished by means of a chain belt running from a sprocket wheel secured to the hand-wheel shaft on to another sprocket wheel secured to a shaft connected with the opposite end of the roll. By this means a parallel adjusting movement of the top roll is secured by simply turning the hand wheel in either direction, according to the nature of the work under way. The width or pitch of the roll grooves must correspond with the corrugated sheet to be formed, the usual pitch of which is 2½ inches. From an inspection of the engraving herewith presented, it will be seen that the rolls are properly journaled and supported in heavy standards, thus imparting strength and rigidity, while preventing possible chance of springing while in action.



New Curving Machine.

Set of Slater's Tools.

Illustrations are herewith presented of a set of slater's tools, such as are now being manufactured expressly for the Illinois Roofing & Supply Company, 203 Lake street, Chicago. One hammer, one ripper and one stake constitute a set. The hammers are perfectly balanced and made of best steel, with leather handles to prevent the hand from slipping. The rippers are strong and durable, made entirely of forged iron and steel. The stakes are properly constructed and made of forged iron and steel.



Slaters' Tools.

FLASHINGS.

ONE OF THE SUFFERERS by the burning of Hercules Iron Works Cold Storage Building at the World's Fair grounds on the afternoon of Monday, July 10, was W. H. Mullins of Salem, Ohio. The fire destroyed the magnificent statue of Columbus, recently turned out by Mr. Mullins and which stood at the main entrance to the building. Although the statue was destroyed, we understand that there are three others in existence, made from the same model, one adorning the park at New Haven, Conn., another in the grounds of an art school at Columbus, Ohio, and the third at Phillipsburgh, N. J.

GILBERT HOWELL of Piqua, Ohio, will have the deep sympathy of a wide circle of friends in the death of his wife, which occurred on the evening of Friday, July 7, after an illness of several weeks. Mr. Howell is secretary of the Lucas & Barnett Company at Piqua, Ohio.

THE LYCOMING METAL WORKERS' ASSOCIATION of Williamsport, Pa., has recently been organized for the protection of mutual interests and the maintenance of better prices for metal work. We understand that those interested met and formulated a scale of prices, by which all agreed to be governed. We are informed that the association is working satisfactorily, and that prices are better and the trade furnishing better goods than heretofore.

MERCHANT & CO. of Philadelphia have recently shipped several carloads of their copper shingles to the Pacific Coast, where they are to be used on some of the largest buildings in Portland, Seattle and Tacoma. They have also shipped a quantity of the shingles to Lexington, Ky., and Atlanta, Ga., for use on two very important buildings in those cities.

WE ARE INDEBTED to Eberts Brothers Company, Limited, 192–198 High street, West, Detroit, Mich., for a copy of an interesting pamphlet entitled "Summer days on the Detroit and St. Claire Rivers." The little volume is profusely illustrated with photo-engravings of buildings and places of interest on the rivers named, as well as at Oak Grove, Port Huron, the St. Claire Flats, Oakland and Grande Pointe. Scattered through the pages are numerous advertisements, among them being that of Eberts Brothers Company, in which attention is called to roofing of various kinds, corrugated iron for sidings, ceilings, doors, shutters, awnings, &c., as well as to roofers' sundries.

JAMES L. FOOTE, manager of the Slatington-Rangor Slate Syndicate, is reported by a local paper to have expressed the opinion that the slate industry, as a whole, was in advance of previous years, and that the outlook for the remaining months was very bright. It is stated that the syndicate shipped in the month of June 121 carloads, embracing 5874 squares, besides several cars of blackboards and milled stock. It is said that orders already booked for shipment in July aggregate more than 7000 squares. Large shipments are being made to the far West at points in Iowa, Kansas, Missouri, Nebraska and Colorado.

ALL TRACE of the fire at the American Roofing Company at Cincinnati, Ohio, has been cleared away, and the old site is occupied by a splendid new building 60 x 200 feet and three stories high. The office is on the second floor and, of course, has a handsome metal ceiling of their own manufacture, while the side walls, columns and girders are covered by ornamental sheet-iron work. One end is used to display samples of the various styles of roofing and corrugated, imitation brick and clapboard siding. The first and second floors are equipped with corrugating machines, rolls, brakes, shears, stamping presses, folders, lock seamers and all necessary machinery, made by George C. Keene & Co., and installed as arranged for by James McCarty, the superintendent. A railroad siding is in front of the building and a small railroad with switches runs through the building out to the siding, so that material can be unloaded on their trucks and brought to any machine or stock pile as desired. The trucks are hauled about the building by means of a rope which is wound about a friction spool which is turned by the engine. At the rear on one side is the engine and boiler, and on the other side of a substantial wall or partition is a fine stable for several horses and wagon storage with labor-saving devices for feeding and watering the horses and washing the wagons. The third floor is used for lighter work and storage of manufactured goods of ornamental character.

AN ORNAMENTAL FEATURE of the Hospital Building at Seattle, Wash., will be a roof of Spanish metal tiles, a carload having just been furnished for that purpose by Merchant & Co. of Philadelphia. They are also preparing to ship three carloads to Portland, Ore., as their Spanish tiles have been specified by Architects Van Brunt & Howe of Kansas City, Mo., for the roof of the new terminal depot in that city. These tiles are finding much favor, owing to the high relief afforded by the design giving an effect equal to the old earthen tile, while besides being durable the building is relieved of a great load, the weight being only about one-third that of tile. Liberal use has been made of these copper tile in buildings on the World's Fair grounds, and a more general use of them is expected where an ornamental roof of superior quality is desired.

WE ARE INDEBTED to W. H. Mullins, Salem, Ohio, and with Eastern agency at 108 Chambers street, New York, for a copy of a very attractive catalogue which has just been issued from the press. The volume is oblong in its general shape and consists of 76 pages of profusely illustrated matter, bound in paper covers. The work shown is made by steam-power machinery and is sufficiently varied to meet the requirements of architects, builders and all having to do with building construction and sheet-metal work. The assortment includes building fronts, galvanized-iron cornices, window caps, wrought and tubular iron awning supports, office railings and fixtures, stair rails, finials, galvanized iron and copper crestings and terminals, iron siding, chimney tops, embossed sheet-metal ceiling, Kinnear's patent lock rib roofing, galvanized iron skylights, and a long list of stamped zinc ceiling center pieces. The catalogue is so arranged as to be of easy reference and in connection with the design presented are given such particulars as the would-be purchaser is likely to require in order to make himself intelligent concerning the goods illustrated. In directing the attention of architects and builders of the country to this publication special reference is made to the fact that in the way of cornice work the manufacture has deviated from old trodden paths and brought out artistic productions of correct proportions and of a character which has not heretofore been attempted in this branch of building construction. The cornices are all made in large sections with brackets, medallions, panels, &c, connected and put in such shape for transportation that any tinner, carpenter or mechanic of ordinary skill can readily put them in position. All work turned out by Mr. Mullins is of the best quality of material and in the very best manner known to the trade.

SOME of the recent shipments by Geo. C. Keene & Co., Cincinnati, Ohio, have been a 23,000-pound corrugating machine to the Wheeling Corrugating Company, at Wheeling, W. Va., which is the third made for them; a cornice brake to the Phœnix Plumbing Company of Phœnix, Arizona; a punching machine to punch ¼ inch holes in No. 10 iron to J. F. Dean, Salem, Mass.; a range maker's flanging machine to the Buck's Stove & Range Company, St. Louis, Mo.; a 10-foot corrugating machine, weighing 11,000 pounds, to the Cambridge Roofing Company, at Cambridge, Ohio; and a machine of the same size to the American Corrugating Company, St. Louis, Mo.; while cornice brakes, from 4 feet to 10 feet, are sent to all sections.

Prize Competitions.

THE COMMITTEE to whom the contributions in Prize Competition No. 18 were referred have awarded the prizes as follows:

First Prize to L. TIFF RISK.
Second Prize to DANIEL P. HOLMES.
Third Prize to RICHARD DAVIES.

House Ventilation for Hot Climates.

A new method of house ventilating suitable for hot climates, the invention of W. B. Gwyther of the Indian Public Works Department, is described as follows by a London exchange: The object of the invention is not only to prevent the penetration of heat through the roof or damp through the floor, but also to provide a means of carrying away heated and vitiated air from inside. The method consists in the use of hollow tubes of earthenware; in the case of flat-terraced roofs these are employed as a substitute for ordinary flat tiles which support the roof concrete. The tubes are laid closely side by side, and, where they meet end to end, a cross flue to secure more perfect ventilation is formed by the use of half pipes. The ends of these flues when feasible should be provided with iron gratings for the ingress and egress of air; the ends of the hollow tubes where they rest on the wall should open into a longitudinal flue made in the wall. Where lateral openings or gratings cannot be arranged, vertical openings through the roof, covered with bent pipes, may be resorted to as an alternative. To draw away the vitiated air from below, perforations in the under side of the tube have been devised. The efficacy of these openings in removing air from the upper part of rooms rests on the fact that heated air moves upward, and after passing through the small apertures, will be carried off through the tubes and cross flues, within which a movement of air will always be going on. In the case of floors the prevention of damp can be effected very thoroughly by the doubly ventilated space.

THE TIN SHOP.

Sheet-Metal Boats.

From E. B. R, *Rising Sun, Ind.*—Please advise me through the columns of *The Metal Worker* concerning the general details and patterns required to construct a skiff. The skiff is to be made of galvanized iron.

Answer.—In complying with our correspondent's request and at the same time offering to those of our readers who may be interested some practical information on the subject, the accompanying design is given.

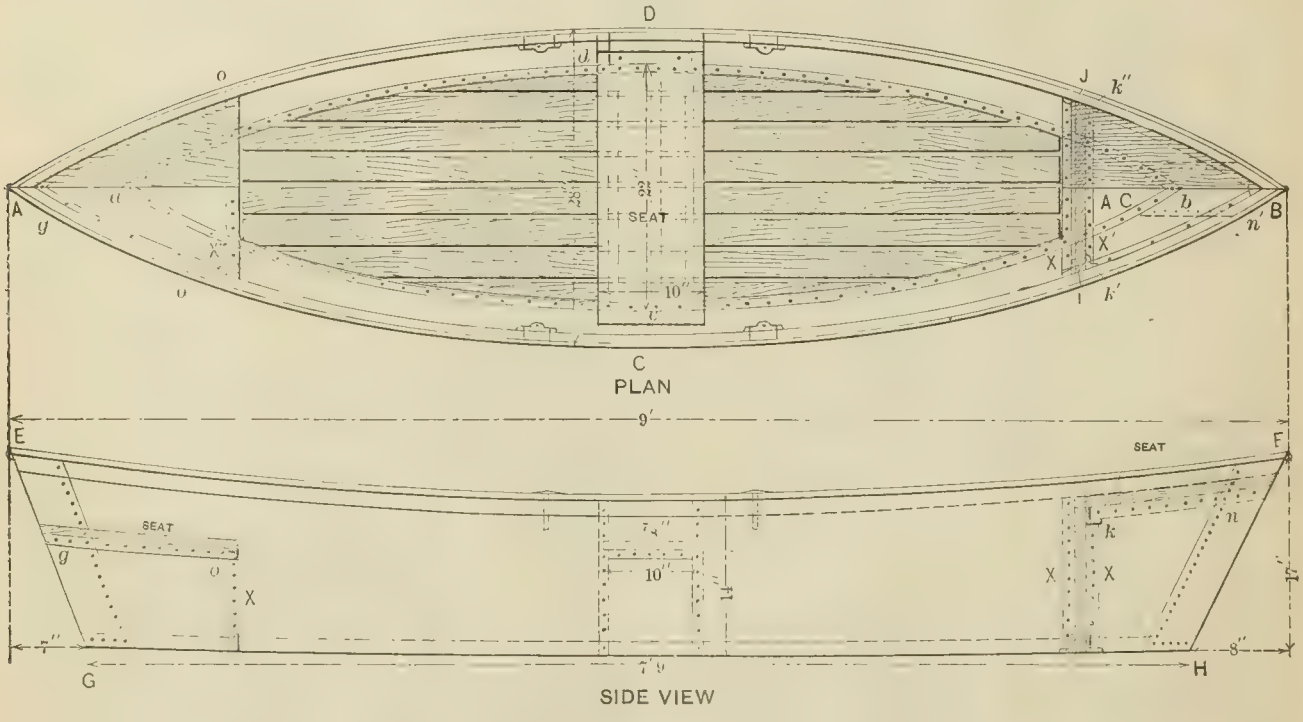


Fig. 1.—Plan and Side Elevation of a 9-Foot Skiff.

SHEET-METAL BOATS.

Although for some of the details entering into the construction of the boat wood is made use of, this feature is not present to the extent that it would require the assistance of an expert shipwright to build the boats. For the seats, bulkheads and strips used to stiffen certain parts of the boats, wood, as a matter of course, is the most suitable material.

In Fig. 1 A B C D represents the plan and E F G H the side view of a small skiff, 9 feet in length and 28 inches beam. The depth at each end is 17 inches, and amidships it is 14 inches. The bottom, across at its widest part measures 23 inches, and in length it is 7 feet 9 inches, or 15 inches shorter than the extreme length of the gunwale from E to F of the plan. The outline of the curve for the bottom is shown by the line *a c b* of the plan. At one end of the boat is an air chamber or life compartment, J I B. The boat is to be provided with three seats, one in the middle and one at each end. The general measurements given before for this style of boat can be changed to suit the builder, but we would not advise making the extreme length longer than 16 feet, and in width not more than 40 inches. A boat built to the measurements shown by the plan and side view, Fig. 1, will have a capacity to carry two persons comfortably, with about 150 pounds additional weight for baggage, &c. To construct the boat, either of the two following methods may be used: One is to get out the sides and the bottom first, then joining the parts together, after which construct the frame work, &c. If this method is used the patterns for the sides can be developed by triangulation.

The other and simpler method is, first, to get out the frame work, then placing the iron for the sides against the same, mark off the outline of the parts required, and then allow for laps. These particulars noted, proceed to construct the frame work. Commence with the bottom frame, making it of either ¾-inch or 1-inch angle iron according to what use the boat is to be put. If the skiff is to be made to the measurements given in Fig. 1, ¾-inch angle iron will do. Make the frame to the exact outline *a c b* and *a d b* of the plan, Fig. 1, arranged in the manner shown by A and B of the sectional view, Fig. 2. The bottom curve of the frame is to conform to the bottom G H of the side view, Fig. 1. The two ends *a* and *b* can either be bolted or if convenient they can be welded together. Drill or punch the holes for rivets through the angle iron about 6 inches apart on each wing, staggering them on the two wings of the iron. Countersink every rivet hole on the side of the angle iron against which the shell or iron is to lay, so that when the rivets are drawn and headed up, the outside will finish flush. Next get out the three braces X, X′ and X″, shown in plan and side views, Fig. 1. Two are required to hold the bulkhead J I in position and also to support the seat J I B. The other brace X″ is required to brace the boat, and is also used as a support for the seat at the other end.

The sectional view, Fig. 2, shows the shape of the braces. The brace X′ placed nearest the end B inside of the air chamber is to be made to form the circuit C D E and F shown in Fig. 2.

The brace X″ is to form the circuit G H E F. The brace X placed in front of the bulkhead J I is a trifle larger than brace X′, and is also made solid. The part C to D is used to fasten the seat. The three braces X, X′ and X″ are each to be fitted to conform to the position demanded for them by the plan and side view, Fig. 1. They are to be made of ¾-inch angle iron.

Space the rivet holes about 2 inches apart on those sides of the braces in contact with the iron sides and bottom of the boat. Through each one of the three sides of brace X′ in contact with the wooden bulkhead J I, punch three holes and countersink them so that the wood J I can be fastened to the brace X′ by short screws. Through the top parts of braces X′ and X″ in contact with the seats drill three ¼-inch holes to allow of the seats being fastened to them by ¼-inch bolts.

Then for the support of the seats from the braces X′ and X″ toward the ends A and B of the boat, make of ¾-inch angle iron the two supports *g o* and *k n* shown in the side view and plan, Fig. 1.

These supports are to be made solid and fitted from *o′ g′* to *o″* and *k′ n′* to *k″*, as shown in the plan, and are to be riveted to the sides on the inside of the boat. Space the rivet bolts about 3 inches apart and when punched countersink the holes on the outside so that the rivets by which the supports are fastened to the sides will finish flush.

The next part of the frame work to get out is the strips for the gunwale. If desired those used on the inside of the boat can be made of oak while the outer ones can be made of iron. Make the inner strips of ⅛ inch by 2 inch stuff, and the outer band of 1 inch half round iron.

Fig. 3 shows how the inner and outer bands are fastened together and also how the iron sides are lapped over the inner strip. First shape the two iron bands of the gunwale as demanded by the plan and side views, Fig. 1. To fasten the wooden and iron bands together use $\frac{3}{16}$-inch bolts. Space the holes for these bolts on the iron bands throughout their entire length about 6 inches apart. To fasten the ends of the iron bands together insert a small block of wood of the required shape between them, as shown in Fig. 4. Then fasten the ends together either by ¼-inch rivets of the required length or with bolts, as shown in Fig. 4. Next get out the four ¼ x 1¼ inch iron strips to be used for the supports for the center seat. How these are arranged is shown by the sectional and side views, Fig. 5, and the plan, Fig. 6, of the cuts. The section A shows the supports bolted to the bottom angle iron of the boat and also to the inner strip of the gunwale at the top. Underneath the seat is shown by *a* the end of a 2-inch angle iron through which a pin projects, used to fasten the seat to the same. A brace of wood is shown above the seat by *b*, this is shown bolted to the upright support and fastened to the seat by a wood screw. The side view B and the plan C show the described details so clearly that no further description of these parts is necessary.

After the entire frame work of the boat has been prepared and ready, set up and bolt the parts of the frame work together temporarily, in such a manner as to enable one to obtain the outlines of the patterns for the sides of the boat.

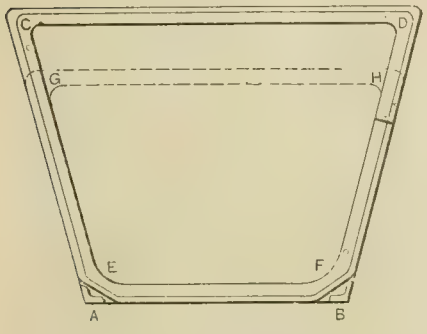


Fig. 2.—Cross Section, Showing Shape of Braces.

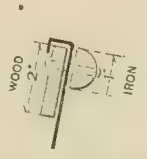


Fig. 3.—Section Showing Manner of Fastening Strips and Iron Band on Gunwale.

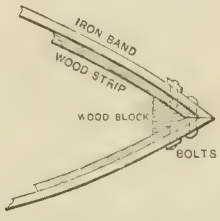


Fig. 4.—Fastenings of Gunwale Bands.

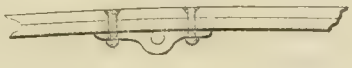


Fig. 7.—Method of Fastening Oarlock Fitting.

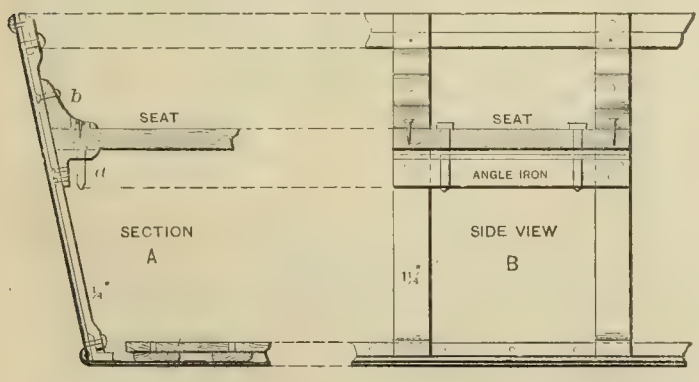


Fig. 5.—Section and Elevation of Middle Seat.

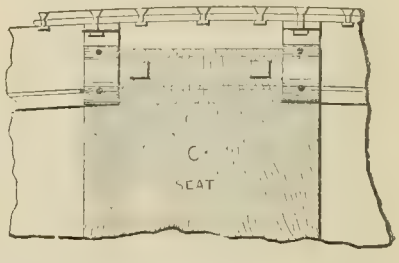


Fig. 6.—Plan View of Middle Seat.

SHEET-METAL BOATS.

To do this, bolt the braces X′ X″ to the bottom angle iron frame of the boat, also the four supports for the center seat. Then bolt in position the outer band of the gunwale by using the four center supports for this purpose. Then from some place near the ends A and B bolt a few strips of the strap iron of required length to hold the bottom angle iron and the iron band of the gunwale the proper distance apart. This done, hold a plate of iron against the angle iron at the bottom and against the inner side of the iron band of the gunwale. Mark off the outlines required for as large a pattern as it may be desired to make any single piece of the sides. Allow for all seams or laps. On the outline of the sides above the gunwale allow 1 inch of iron. This is

to be turned over inner ½-inch strip when this strip is placed in position. The bottom of the boat is made the same in shape as the outlines of the bottom angle iron demand, and cut out after the iron required for a double seam has been allowed. For a skiff of the dimensions given by the drawings in Fig. 1 the sides may be made of No. 26 gauge galvanized iron. Use 24 gauge iron for the bottom, using if possible a single piece. The sides and bottom may be joined together by a double seam. This will be as safe and as strong a joint in this position as a riveted joint would be, owing to the stiffness and protection provided for it by the bottom angle iron of the boat. Any cross seams occurring on the sides may be riveted. After all the parts have been made ready put the sides and bottom together, then solder and thoroughly soak each seam. For additional strength fit over each end, on the outside of the end joints where the sides come together, pieces of heavy galvanized sheet iron, as shown by the side view in Fig. 1. After these plates are placed in the positions desired close rivet them, as shown, then solder and soak the joints and rivets in a thorough manner. Now place the bottom angle iron frame (to which the four supports of the middle seat have been bolted) in position. The bottom frame must, as a matter of course, fit snug against the sides and the bottom of the shell.

If the frame at any point does not fit just right this fault must be remedied. This done, rivet the frame to the bottom and sides, have each rivet finish flush on the outside of the boat; then thoroughly solder and soak each rivet from the outside; then place, fit and rivet the braces X′ and X″ in their proper positions, as demanded, also the supports for the two end seats from the braces X′ and X″ toward the ends A and B of the boat. This done, solder the rivets on the outside of the shell.

Now prepare the wooden bulkhead J I for the air chamber. This should fit snug against the brace X′ and against the sides and bottom of the boat.

Fasten the bulkhead to the brace by short screws; then cover the inside parts of the sides, bottom and the bulkhead of the air chamber with a heavy coat of good paint. This done, cover the bulkhead J I on the outside of the air chamber with galvanized iron, and also the top from B to the bulkhead. Fasten these plates to the sides by riveting them and then solder and thoroughly soak each joint, &c., so that the air chamber will be perfectly air tight. The brace X may then be placed in position and the two end seats of the boat prepared, fitted and bolted in place. In the plan view, Fig. 1, but one half of each of the two end seats is shown in position by the shaded parts of the drawing. The other half of each seat has been left off to show the construction of the parts underneath the seats. The end seats may be made of some suitable hard wood, ⅞ inch in thickness. For the center seat use ⅞-inch or 1-inch stuff. This seat may also be placed in position and fitted in the manner demanded by the drawings, Figs. 1 and 5. This done, proceed to place the iron bands of the gunwale and also the two wood strips for the inner bands in position. As the sheer of this boat is but 4 inches, the 2-inch by ½-inch oak strips will readily bend to the regular curve without any previous preparation or steaming. The iron of the sides, as previously described, will project 1 inch above the strips and bands of the gunwale, after these have been fitted and bolted in the positions required. After this has been done turn the 1-inch projecting edge down and over the ½-inch inner strip. Do this neatly. Then nail the edge projecting down on the inner side with short wrought nails, spaced about 1 inch apart. Finish these edges as smoothly as possible.

The fittings, such as oars and special oar locks, required can be procured from any jobbing house handling boat hardware. Whatever style may be selected can readily be attached to the proper positions on the bands of the gunwale. Fig. 7 shows one method of fastening the fitting for an oarlock. To cover the bottom of the skiff use any desirable hard wood. Strips ½ inch thick by 3 inches wide will make a neat grating. Make the grating for the entire bottom of the boat in one piece by fastening the strips running lengthwise of the boat together with three cross pieces, one at each end and one in the middle under the center seat of the boat. So the center seat can be removed, the grating when made can readily be placed in position in the bottom of the boat. After this is in place fasten two strips on the grating at any suitable distance from the middle seat. These strips are to serve as foot rests for the person rowing the boat. After the entire iron and wood work about the skiff is finished, apply two coats of good paint to every part of the surface of the iron. The wood work can either be painted or finished in oil or varnished as desired by the builder.

Glass curtains, observes *Inventions* of London, are a novelty in art industry for house furnishings. They are in colored glass, and have the effect, when closed, of stained glass. They consist of a series of little squares of colored glass, each set in a small zinc frame, the squares being attached to each other at the four corners by little S-shaped hooks. We are told that they can be as easily taken down and moved as any other curtains, and, in case of changing from one size of window to another, can easily be enlarged or decreased in size by the addition or subtration of a certain number of squares. They are also easily cleaned, and one of their particular attractions is said to be cheapness. They are now being shown at the Palais Royal, Paris.

Propagation of Sanitary Knowledge.

In spite of all that is claimed for them, Americans have not as yet a complete monopoly in progressive ideas, and there are often valuable hints to be gleaned from the procedure of foreign municipal and other public bodies, of which we might with good advantage avail ourselves. In the matter of sanitation, for instance, there is much to be picked up. A news item in a recent number of a Scotch sanitary journal refers to a system which has been adapted with great success in a small Scottish county, and which appears to have been much appreciated by the public. Instruction in the principles of domestic and city sanitation, given in such a way as to reach the popular understanding, has been for some time given by the sanitary inspector of the county of Wigtownshire, Scotland, a small and somewhat unimportant county, which has hitherto never been looked upon as a leader in scientific progress. The inspector has been delivering a course of free lectures of a popular character at different centers throughout the county. These lectures, which were illustrated by lime-light pictures, dealt with such subjects as the practical principles of sanitation, cleanliness, sanitary duties of householders, the worth of fresh air and other matters of everyday importance. The importance in homes of good lighting, efficient plumbing, healthy methods of heating, &c., was prominently brought forward, and we learn that great interest was excited, which has borne practical fruit throughout Wigtownshire. This is just a sample of what might be done in this line to enlighten the general public everywhere on the important question of domestic sanitation.

Bell Founding.

The art of bell founding, observes the *Gentleman's Magazine*, is undoubtedly of great antiquity. The Saxons are known to have used bells in their churches, although probably small ones, for the venerable Bede, writing at the end of the seventh century, alludes to them in terms which seem to show that they were not unfamiliar things. The towers of the Saxon period have belfries of considerable dimensions in most cases; and at Crowland Abbey, in South Lincolnshire, there was a famous peal of seven bells many years before the Norman Conquest. The monks at that time, and for long after, were the chief practitioners of the art of bell founding, which, indeed, is one of the many things those well abused men have handed down to us.

Their bells were rarely without inscriptions, often in very bad Latin, containing, perhaps, some obscure joke, the point of which is quite lost. More often they were of a religious nature, sometimes, we fear, not unmixed with a dash of superstition, as when the bell declares that its sounds drive away the demons of the air who caused pestilence and famine, lightning and thunderstorms. As a rule, unfortunately, they put no dates on their bells—a defect which has been in some measure overcome by the researches of many enthusiastic campanologists, but which is likely to keep the early history of bells shrouded in darkness for a long time to come.

Fair Notes.

In the southeast corner of the Anthropological Building at the World's Fair are a few interesting sanitary and hygienic exhibits that are well worth visiting. It might at first thought seem out of place to show apparatus of this sort among gymnasium outfits, model prisons, diagrams of the distribution and kinds of criminals and various devices relating to the science of penology, but when it is considered how large an influence good health has in lessening crime the location of these exhibits will not appear unreasonable. There are some foreign exhibits relating to quarantine work that more especially interest the medical profession, but what our readers care most about are the following:

THE FULLER & WARREN WARMING COMPANY,

Chicago, show a No. 950 Fuller & Warren horizontal school furnace set in position in the way it would be placed in the cellar of a building. The furnace is built of cast iron sections of circular form, with corrugated exterior and bent flues piercing the sections from the side to give large heating surface. The furnace is made in two sizes, and the capacity can be altered by adding sections at the end. The grate is 2 feet 3 inches by 3 feet 3 inches, with rocking bars, and has cast-iron sectional ventilated lining. These furnaces are part of the heating and ventilating system of the Fuller & Warren Company, the ventilating feature being shown by a vertical shaft operated by the Holbrook syphon system. In the Fuller & Warren plan the heating and ventilating systems are distinct and separate, which feature they refer to as overcoming entirely the danger of offensive odors reaching the school room.

BROWN & SHARPE MFG. COMPANY,

Providence, R. I., have examples of sanitary closets on exhibition. The closets intended especially for shops, mills and factories, are iron hoppers for double closet, falling toward the center, where there is a device for periodical discharge of the contents. There is also an iron pipe about the top serving as a flush rim.

J. A. BOWDEN & CO.,

Detroit, Mich., show the Bowden single valve filter and illustrate its efficiency with jars of water "before and after using."

THE PASTEUR-CHAMBERLAND FILTER COMPANY,

Dayton, Ohio, have a pretty display of nickeled filters, and also glass apparatus showing the operation of the device. This firm, we understand, now control the filter in the United States, having bought the right from Dr. Pasteur.

W. D. CUMMINGS FILTER COMPANY,

Philadelphia, have several filters in operation. These filters use bone black as a purifying agent, besides filtering material for removing solid impurities from the water.

THE M'CONNELL FILTER COMPANY,

Buffalo, N. Y., exhibit in a blue-lined booth various styles of the McConnell Polar Electric Germ Proof filter. The special feature of this filter is the use of one large tube of a dense clay giving an extended filtering surface. The tubes are adapted to both gravity and pressure filtration. Part of the exhibit consists of coolers in connection with these filters. A notable feature of the filters is the cleaning arrangement which permits the easy removal of dirt from the clay cylinder.

THE BOSTON FILTER COMPANY,

Chelsea, Mass., exhibit the Boston Water Purifier, a filter for faucets and for gravity use. The filtering material is an unglazed porcelain tube closed at one end, the water passing from the outside inward, leaving all suspended dirt and organic matter on the outside of the tube. The tubes are easily removable and are cleaned with sand and a brush. By filling the tube with animal charcoal all organic discoloration can be removed.

ALBERENE STONE COMPANY,

New York, have in place an interesting display of laundry tubs, sinks, griddles, foot warmers, &c. The material is claimed to be absolutely non-porous and is therefore a sanitary article of high value. It is said to be acid resisting, and with a hard, fine surface is easily kept clean.

THE PERFECTION CLEAN OUT COMPANY,

Haverhill, Mass., show vertical lines of pipe made up of T's, Y's and straight lengths and all fitted with perfection clean outs. This device, with which our readers are familiar, offers a simple means of getting gears to a pipe at any point where there is danger of stoppage.

NORTON BROS.,

Chicago, show examples of the Norton hermetic seal noisless sanitary fixture, a water closet for which special features are claimed in respect to its seal, which is a bronze valve controlling the inlet of water and also the outlet of sewer. The closet is operated by a lever handle at the side of the seat.

THE AKRON, CANTON STONEWARE AGENCY,

Chicago, have a booth containing a number of combined filters and water coolers, some of the latter being tastefully decorated. The filter proper is a disk of natural stone, through which the water percolates, leaving the sediment on the top side. The disks can be easily removed and cleaned. A pressure filter is also shown, consisting of a nickel-plated shell holding a cylinder of stoneware through which the water is passed.

W. E. BEVERIDGE,

Baltimore, Md., displays the Beveridge automatic cooker in a large variety of sizes. The cookers are arranged about three sides of an alcove and make an attractive showing.

WILMOT CASTLE COMPANY,

Rochester, N. Y., have an interesting collection of cooking apparatus. The Arnold steam cooker consists of a water bottom in which the steam is generated rising into a cylindrical chamber above it in which are the receptacles for food. The apparatus is very compact and is said to be especially useful in connection with gas and gasoline stoves, though it is also useful with coal stoves. The Arnold Steam sterilizer is also a part of this exhibit, which is in charge of N. H. Peterson.

UNITED INDURATED FIBER COMPANY,

Eastern agents, Cordley & Hayes, New York, and Western agents, Indurated Fiber Ware Company, Chicago. The display of this company is in the Forestry Building and consists of a pavilion built up largely of indurated fiber goods. The pillars supporting the roof are made up of bowls, pails, basins and tubs, while the electric lights between them are shaded in funnels of the same material. All about the display the eye is arrested by an article of indurated fiber put to some such extraordinary use. Besides the make up of the pavilion, a large variety of other articles are displayed about the counters. A notable article among the variety of goods is a bathtub made by the Oswego Indurated Fiber Company. Altogether about 100 different articles are exhibited, which show the wide application of this material. The exhibit is in charge of Homer Drake.

Cost of Living in European Cities.

A commercial return has recently been issued in England which gives some interesting particulars as to the comparative price of certain staple articles of food in various cities of Europe. The cities selected are Paris, Lille, Frankfort-on-the-Main, Hamburg, Berlin, Vienna, Buda-Pesth, Prague, Rome, Florence and Brussels, and the figures given show the average retail price per pound, avoirdupois, of articles of domestic consumption, medium qualities, such as would be obtained by working people. The prices of prime beef varied very much. In Prague it could be obtained for 14 5 cents a pound, in Vienna for 16 cents, in Rome and Buda-Pesth for 18 cents, while in Paris the price fluctuated between 25 cents and 35 cents, and in Lille as much as 37.5 cents had to be paid. Flour ranged from 2.40 cents in Buda-Pesta to 5 cents in Paris, Frankfort and Florence. It is curious to notice that, while in Lille flour could be purchased for 4 75 cents a pound, and white household bread cost 3.40 cents, in Berlin this was exactly reversed, bread costing 4 75 cents a pound, and flour being 1.10 cents cheaper. Potatoes were under 2 cents a pound in all cities except Hamburg. Rice ranged from 3.40 cents (in Brussels) to 10 cents, sugar, "good white lump, cracked or sawed," from 8 cents to 15.50 cents (in Rome and Florence); and coffee, Brazil or plantation, roasted and ground without chicory or other coffee substitute, from 35.50 cents in Berlin to 62 cents in Paris. In Brussels, coffee from the Dutch colonies can be obtained for 30 cents a pound.

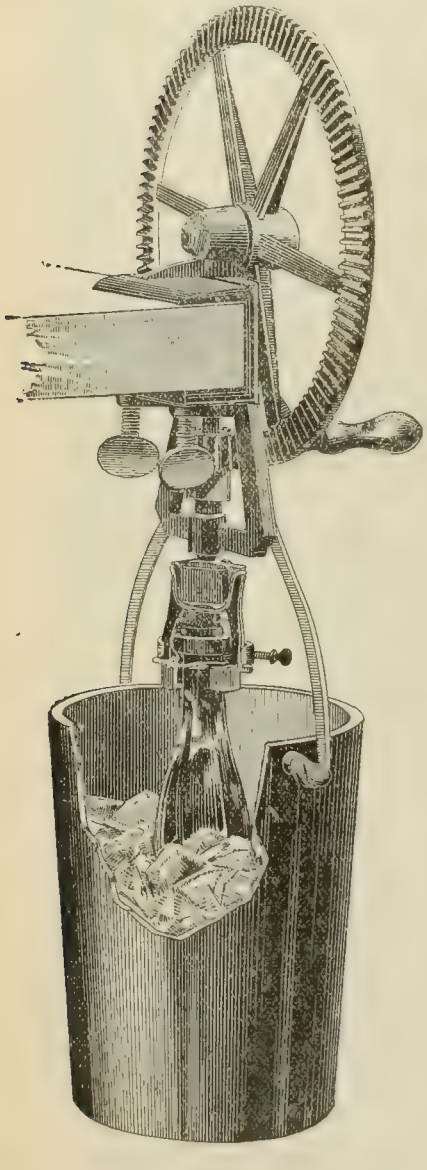
In connection with this subject it may be mentioned that Dr. Ogle, an English statistician, has lately stated, as the result of investigations made by him in London, that he had ascertained the average income of 21,443 workingmen in full employment, representing with their families 97,784 persons, to be $6.28 a week; or an average of $1.37 for the maintenance of each member of a family. The rent expenses averaged $1.48 a week, or 23½ per cent. of the total receipts.

Sealed proposals will be received at the office of the Supervising Architect, Washington, D. C., until July 25, for all the labor and materials required to put in place complete the cast iron and Z-bar columns, steel and iron floor, ceiling and roof construction, ceiling light, skylight roof, dormers, &c., for the United States Post Office Building at Worcester, Mass., in accordance with the drawings and specification, copies of which may be had from the Supervising Architect at Washington, or the Superintendent at Worcester, Mass.

THE RETAIL STORE.

Wine or Beverage Cooler.

Cobin Mfg. Company, 107 Chambers street, New York, are introducing a wine cooler, as here shown. This apparatus is designed to freeze or frappé a bottle of wine or other beverage in from three to five minutes, and is intended to obviate the necessity of keeping various bottles in the refrigerator. It also enables a host to meet an emergency quickly. The bottle may be cooled in the ordinary fiber or other



Wine or Beverage Cooler.

bucket with the usual ice and salt mixture. With each machine is included a perforated zinc shell, which can be slipped over the bottle in the ice, permitting the bottle to be drawn from and replaced in the cooler instantly. The machine is galvanized to prevent rust, is 20 inches long, the large wheel being 12 inches in diameter. To make it noiseless, the small gear is of rawhide, while the clamps catching the neck of the bottle are lined with the same material. In commercial shape, the apparatus, bucket and zinc shell are put up complete in a crate in shipping order.

The Go-Bang Rat Trap.

Waddel Wooden Ware Works, Greenfield, Ohio, are putting this article on the market, an illustration of which is

The Go-Bang Rat Trap.

given herewith. This trap can be set automatically by the hand or foot. Its construction is such, it is stated, as to render its action unerring, the simplicity being also referred to as reducing the cost of manufacture to a minimum.

Royal Coffee Pot.

M. Stransky & Co., 27 Murray street, New York, are offering the above goods, as illustrated herewith. They are fur

Royal Coffee Pot.

nished in assorted colors, cameo, inlaid and garnet. The features of the pot are the hinge and the manner in which the wooden handle is fastened to the body of the pot. Two rivets, on which a thread is cut, pass through the body of the pot at the back, near the seam, and are riveted on the inside of the pot before the coating is put on the metal. The handle is fastened to metallic pieces, which, in turn, are secured to the pot by caps screwed on to the threads of the rivets. The hinge is fastened to the upper metallic piece. This arrangement is referred to as preventing the handles from getting hot or coming off. Tea pots are provided with the wooden handle and hinge the same as the coffee pots. The covers of both lines of goods are nickel plated.

Export Notes.

A New York exporting house of much experience, handling American products, has recently shipped an order for Band Iron aggregating 1500 bundles and weighing 67,000 pounds. They also report good orders for Merchant and Bar Iron, square, round, angles and various shapes of miscellaneous sizes and dimensions in addition to a shipment of three carloads of Boiler Plate, not long since. Their orders have run in 50 to 150 bundle lots of a size or kind, and so far, although competing directly with English manufacturers, have not had a complaint as to quality. Out of 250 letters sent to foreign clients in this trade all but 10 per cent. responded in some form or other, showing a desire to trade here if their wants can be met.

We know of an instance where a first order for a case of sheet metal to be used in the arts abroad, amounting to but $32, was received and properly executed. On its arrival out, care having been taken to follow directions, &c., it was quickly followed by a second order of 40 cases of the same goods, of a total value of $900. This is not only another instance of the wisdom of properly filling an order in all its details, without regard to the value of the invoice, but is evidence of a practical character that our neighbors in the West Indies, Central and South America can be induced to largely increase their purchases with us, if we will but note their explicit commands and follow directions.

An incident occurred recently which indicates somewhat the extent of progress trade is making with commercial houses in Spanish America affected by some of the reciprocity treaties now in operation. A buyer came to this city with memoranda for a line of iron of various kinds, amounting in all to 20 carloads. After much inquiry and the receipt of numerous quotations the orders were left here, whereas formerly they had been executed in England and on the continent. This is referred to by those interested as showing that mill men are coming to see the value of securing these orders, and are now working in harmony with those able from many years of experience to influence such orders.

COBIN MFG. COMPANY, 107 Chambers street, N. Y., are introducing a Refrigerator Shelf, a patent for which has been applied for. It is a combination of steel strips, tubes and rods in a frame, which can be of any size or shape. It is galvanized after it is made. Emphasis is laid on the fact that there are no cracks, crevices or holes into which substances of any kind can accumulate and decompose, and that it can be quickly cleaned.

STOVE TRADE NOTES.

The Future of the Hot-Air Furnace.

By A. W. Glessner,

President of the Excelsior Steel Furnace Company.

A NEW FIELD FOR FURNACES.

In a former article reference was made to the fact that in Philadelphia and elsewhere furnaces were being placed in workingmen's homes, and it is difficult to overestimate the importance of this movement, for it opens up a new and wide field for the hot-air furnace. The effect will be to take the hot-air furnace from the list of luxuries and place it where it properly belongs, among the necessities of the modern home. The fact is that no intelligent man, be he clerk, mechanic or laborer, can afford in building a home to attempt to heat it with stoves if he has any idea of economy. Building to-day has reached a point where the cost is computed upon the cubical contents of the same as compared with the available rentable space in square feet of floor, and 'twere folly to build a house and then sacrifice in each room from one-eighth to one-tenth of the floor space by the introduction of a stove. A room 10 x 12 feet, heated by a furnace, is more available than one 12 x 14 feet, heated by a stove, as a stove cannot be tucked away in a corner nor up against the walls, and neither can any piece of furniture be placed in close proximity, so that a large proportion of the best part of the room must be given up to the stove. Furthermore, if all rooms and halls are to be heated by stoves, then more than one chimney must be provided, taking up additional room and requiring additional capital. In this climate the Chicago *Tribune* has stated that there are but two months in the year when artificial heat is not required, and in all places north of the Mason and Dixon line artificial heat must be had during portions of fully eight months out of the 12. Hence, it follows that the man who heats by stoves must yield during two-thirds of the year very valuable space to his heaters, and must, accordingly, provide rooms of greater size; and if the additional cost was estimated it would provide the fuel for heating the building for a term of years, to say nothing of the saving of the interest on the additional cost.

The introduction of the hot-air furnace into the workingman's home marks an important economic fact, which is that the time has arrived when a hot-air furnace can be installed in a house of moderate size for less money than can stoves of sufficient capacity to heat it, and this can be easily demonstrated. Recently a contractor in Philadelphia built a large number of houses of small size, and, as is customary in that city, a hot-air furnace and brick-set range were required in each house. Bids were invited and a contract was let for this work at a price for the two articles duly installed actually less than I have known a gentleman in an Illinois town to pay for a heater of large size set up in his parlor, and the figures in the former case, while close, admitted of a margin, though a small one. The castings of the furnaces were supplied by the manufacturers, and the steel work was mounted by the heating contractor. What gauge of steel was used I do not know.

(To be continued.)

Peninsular Stove Company.

We are indebted to the Peninsular Stove Company, Detroit, Mich., for an attractively printed catalogue within the covers of which attention is called to the extensive line of stoves, furnaces, cast iron and wrought steel ranges which they manufacture. The work is issued in the form which has proved so popular with the trade and which renders reference to the various lines of goods shown convenient and easy. The Peninsular wrought steel range is the first candidate for consideration, this being a construction for which the makers urge many claims. The fire box and flues are said to be so disposed that the products of combustion are directed in an even and thorough manner over all the plates, making it a quick, powerful and efficient baker. In the construction of this range the company have aimed not only to produce the largest assortment, but to make it the finest in finish and most complete in detail of any line on the market. Tables are presented giving the oven dimensions, cooking surface and other particulars concerning the various sizes in which the stove is made, while a price-list shows the figures at which the goods can be obtained. The cast-iron ranges occupy something over 80 pages of the catalogue and are under names in which the word "Peninsular" is a prominent factor. The same may be said with regard to the cook stoves, which are illustrated and described in the 40 pages which follow. The heaters are represented with the Regal Peninsular in the place of honor. This stove has a large radiating surface, embodies the modern improvements and is so constructed in its various parts as to prove a powerful heater in operation. It is shown in several varieties, followed by the Royal Peninsular, which is similar in its make-up to the one just described, but it is somewhat less in price. The Radiant Peninsular is another handsome parlor stove, as is also the World's Leader, a surface burning construction adapted for hard coal, coke or natural gas. The Oak Peninsular is shown in several varieties, following which we find the Franklin Peninsular, a richly treated stove; Empire Cannon, the Crystal Peninsular, a handsome wood base heater; the Diamond Peninsular, a member of the same class; the King, a neat box stove, and a line of hot-air furnaces, one of which is intended for burning wood only. Several pages are given up to a price-list, dimensions and capacities of Peninsular furnaces, following which are price-lists of stove hollow ware, mica, fire-brick linings, sundries and a general index.

The Thomas, Roberts, Stevenson Company

of Philadelphia have issued to the trade a catalogue of 222 pages, covering their line of stoves, ranges and furnaces. The prefatory address to the trade appears in English, German and Spanish. Among the new goods mentioned in the book are the Ideal Fortune, a six-hole range, with right or left hand oven or fire, wrought-steel oven, sheet flues and slide in bottom of oven, to allow of easy examination or withdrawal of contents; a plate rack, with gas burners, on which a patent is pending, for use as a warming shelf or for burning gas on top surface of range; the Colonial Fortune six-hole range, possessing the same general features as the Ideal, but designed particularly for the building trades, and the Hecla Fortune open grate or fire-place Heater, with round or square frame, designed to heat the air entering in front through the skirt or base and discharge it into the room in which the heater is set, or by means of a damper to allow of its ascent to an upper room. The other articles illustrated and described in the book are the well-known New Altoona, New Broadway, New Happy Choice, Extra Fortune, Ivy Fortune, New Fortune, New Finest, New Champion, Windsor, Superior, Crescent, Pearl, Grand Times, The Times, Good Times, Harvest Home, Virginian Girl, Zeb Vance, Georgia Queen, Southern Baker, Southern Queen, Iron City, Southern Gem, Jumbo, Active Fortune, West Side, Regal Fortune, Modern Fortune, French Fortune, Home Fortune, Gem Fortune, Fountain, Star Fortune, Phœnix and Atlas ranges; their line of furnaces comprising the Challenge Syphon, Star Syphon, Fulton, Popular Finest, Popular Fortune, Phœnix Portable and the Iron Clad air-tight wrought-iron furnace, with new front and triplex grate. Heating stoves covering the Sterling Fortune, a new base burner and double heater (described in a recent issue), Vesuvius, The Leader, Haverford, Violet, Banner, Daisy, Daisy Egg, Pavilion, Electric Franklin, Franklin Pride, New Favorite, Garnet, Bon Bon, Eureka, and numerous Laundry and other heating stoves for all purposes. Especial features of the catalogue are a chapter on "Setting and operating Active Fortune Ranges," which anticipates all the difficulties likely to occur in situating the ranges, and clearly illustrates the right way and wrong way of connecting the boilers with the water backs; outline cuts of the Active Fortune, and Regal ranges, and the Challenge Syphon furnace, with dimensions; an illustrated treatise on ventilating canopies, and a quantity of information useful to the trade. The book is well printed on good paper and bound in a stiff buff paper cover with the name and address of the company embossed on the fronts. The Gauze door ranges and stoves made by the company under the Giles F. Filley patents are described in a separate catalogue issued by the company.

The Joliet Stove Works

of Joliet, Ill., have just issued from the press their thirteenth annual catalogue, which is a neat volume of 36 pages, bound in terra cotta colored paper covers. In offering this volume to the trade the company direct attention to a few facts which are likely to prove interesting. They state that from their infancy in 1870, when only a few men were employed, their business has expanded, until to-day 200 skilled workmen are employed in manufacturing cook stoves and heaters. They employ nothing but the highest grades of pig iron in the construction of their goods, which have established a gratifying reputation in the trade. The company have recently added a new line of Moore's ranges for both hard and soft coal, and have embodied some new features in Moore's air tight heater. The ranges which are considered include Moore's Perfection, made with six boiler holes, duplex grate, large square oven, draw out hearth, extra large broiler door and rich ornamentation; Moore's Fidelity, a six-hole range for burning soft coal or wood, made in a number of styles and sizes; the Fidelity, a medium-priced range of attractive appearance; the Fidelity cook, having large oven and fire box, especially adapted for burning soft coal, and the Fidelity four-hole wood cook. The leading place among the heaters is given to Moore's air-tight parlor stove, which is richly ornamented with nickel and art tile, and embodies features of construction which render it powerful in operation. The Fidelity Todd for wood and the Joliet cannon stove are also illustrated and described. Accompanying the catalogue is a little pamphlet entitled "The Reasons Why." Glancing over its pages we find the matter to consist of a series of testimonial letters, telling of the satisfaction which Moore's air-tight heater has given to those who have practically demonstrated its merits.

The Co-Operative Foundry Company

of Rochester, N. Y., have issued their twenty-seventh annual catalogue of the Red Cross line of parlor and cook stoves, ranges, &c. The volume measures 5½ x 7¾ inches, consists of 120 pages of profusely illustrated text, and is bound in flexible covers, carrying an embossed side title in old gold and green. The design includes the name and address of the company, as well a sa *fac-simile* of their trademark. The opening pages are devoted to the line of Red Cross ranges, which are shown in great variety. This line embodies among its features a draw-out oven rack, which permits the contents of the oven to be readily inspected; large ovens, perfection grate and attractive ornamentation. In addition to the Red Cross we notice the Monroe, the Model Red Cross, the Iroquois Chief, the Red Cross Herald, the Favorite and the Red Cross Talisman. Under such names as the Magic Red Cross, the Maple Leaf, the Red Cross Champion and the Red Cross Banner the company offer an interesting assortment of cook stoves adapted for burning coal or wood and for wood only. The leading place among the heaters is given to the Red Cross square parlor stove for hard coal. This is well known to the trade, having been extensively introduced, and is this season offered in the same graceful outlines and effective decoration which has characterized it in the past. The Royal Red Cross is a neat square parlor for hard coal embodying the latest features and is shown in general and sectional views. The Brilliant Red Cross for burning natural gas, the Black Prince, an all-cast cannon; the Red Cross oak, Sylvan Red Cross cottage parlor and the Sunflower box are some of the other goods illustrated and described. The closing pages of the catalogue are given up to hot air furnaces and a miscellaneous list of hollow ware, price list of stove and range linings, North Carolina mica, sundries, stove platforms and a general index.

The Chicago Stove Works.

We are indebted to the Chicago Stove Works of Chicago, Ill., for a copy of their annual stove catalogue, printed in good style upon white paper and bound in ornamental paper covers. The side titles are printed in old gold and a delicate shade of green upon a black groundwork, and give to the volume a very attractive appearance. The early pages of the volume carry a general view of the works of the company at Chicago, and also of the plant of the Bussey & McLeod Stove Company, Troy, N. Y., who manufacture Gold Coin stoves in the East. The goods shown include a varied assortment of cook stoves, ranges and heaters, made under the generic name Gold Coin. The features embodied are of the modern type, while the ornamentation is of a character to please the eye. The goods have established for themselves a wide reputation in the trade and are known over an extended territory. The Gold Coin ranges occupy nearly 75 pages of the volume, among the goods being several new patterns for this season. The cook stoves are considered in the following 30 pages, after which we find an interesting assortment of heaters. These are presented under such names as the Gold Coin square wood base-heater; the Gold Coin Ventiduct wood parlor; the Gold Coin Ventiduct oak; the Gold Medal Todd; the Ajax box for wood only; the Gold Coin Ventiduct base burner with hot air flues, a stove which has been improved for the season of 1893; the Gold Coin base burner, an entirely new heater this season; the Gold Coin Ventiduct surface burner, and an interesting assortment of Franklin, Cylinder, Cottage Parlor, Globe, Cannon and laundry stoves. The catalogue considered as a whole is well arranged and is likely to find a place among the literature of the dealer into whose hands a copy may come.

The Michigan Stove Company.

Among the handsome trade catalogues which have come to hand the present season, that issued by the Michigan Stove Company takes a high rank. Its general make-up gives evidence of a careful attention to details and due consideration of the requirements of the stove dealer. The matter contained within the stiff board covers of the volume is of such a nature as to prove both interesting and valuable to those for whom it is intended, while the mechanical execution entitles it to a prominent place in the dealer's library of trade literature. The volume is made up of 176 pages, the body of each of which is of a delicate shade of chocolate, relieved by an ornamental border in a lighter color. The printing is in pure black, forming with the paper of which the volume is composed, a striking contrast. The corners of the pages are rounded, thus adding to the general effect, while the covers are ornamented in silver and black upon a groundwork of terra cotta. A commendable feature of the catalogue is a back title, consisting of the words "Garland Stoves and Ranges, 1893-94." By this means the volume may be readily identified by the dealer, even when filed away with other trade literature. The opening pages are given up to a list of the officers and directors of the company, a general view of the Western headquarters in Chicago, a statement of terms, a telegraphic code for use in ordering goods by wire, an illustrated description of the Garland Aerated Oven, the success of which has been pronounced, and some general remarks on the subject of advertising. As our readers are well aware, the goods of the company are made under the name "Garland," which word is used in combination with others to designate different varieties. The ranges occupy nearly 65 pages of the catalogue and are shown in great assortment. The ornamentation is of a high order, producing rich and beautiful effects, while the constructive features are such as to give the goods a wide reputation. Cook stoves follow the ranges, after which we find the Garland line of heaters. Many of these goods have been improved and redressed for the season of 1893, while a number of new patterns have been added. The constructive features are of the latest type, the ornamentation is rich and handsome and the varieties offered sufficient to meet all requirements of the trade. The leading place is given to the Art Garland for hard coal or coke, following which is the Peerless Garland, the Alpine Garland, the Novel Garland, Acme Garland, the Syphon Oak Garland, the Horizontal Garland, the Oak Pennant and the Hickory Pennant. A feature of the catalogue which cannot fail to be appreciated by intelligent dealers everywhere, is found in the closing pages, which give sectional views of cook stoves, ranges and heaters, with all the parts numbered, each number referring to an explanatory table. This permits the dealer ordering repairs to designate the parts by their correct names and thus avoid many of the annoyances and mistakes which are so common to this branch of the business. A price-list of brick linings, mica and sundries, together with an index for the telegraphic code words and a general index complete the catalogue.

ODD PLATES.

MERRILL B. MILLS, treasurer of the Michigan Stove Company, is the owner of a beautiful steam yacht, "Grace," which is now cruising in Lake Michigan in the vicinity of Chicago. On the 15th inst. the employees of the Chicago branch of the Michigan Stove Company were favored with an invitation from Mr. Mills to enjoy the hospitalities of the "Grace" in a cruise on the lake, occupying the afternoon. The invitation was conveyed by means of a very dainty card, beautifully printed and couched in formal, but graceful language as befitted the occasion.

THE FOX FURNACE COMPANY of Cleveland, Ohio, have brought out a hot-air heater which is claimed to embody the latest improvements, and which is so constructed as to give satisfactory results in operation. We understand that price-lists will be furnished to those who may apply.

J. D. MARVIN, representing the interests of the Fuller & Warren Company, Troy, N. Y., started this week on his tour among the stove trade of Long Island. After covering that territory he intends to call on dealers in Connecticut and Massachusetts.

THE LATEST ADVERTISING NOVELTY issued by the Barstow Stove Company, Providence, R. I., is a folded card, circular in shape, and intended to represent a small globe of the world. Opening the folder we find an announcement to the effect that the company could not get sufficient space at the Chicago Fair for a satisfactory display of their goods, and they therefore decided to make no exhibit. They inform the reader, however, that he may look the fair over, or even the world, for that matter, and he will find no better line of furnaces, ranges or parlor stoves than the Bay State line.

THERE is a restaurant in Paris where all the cooking is done by electricity.

THE AMERICAN TUBING & WEBBING COMPANY have, since the big fire in Providence, R.I, on May 21, of the present year, by which a portion of their works were destroyed, established a model tubing factory, equipped with the latest improvements in the way of machinery and appliances. The company manufacture flexible gas-tight tubing, oil stove wicks, silk and cotton elastic webs, and state that they are now better prepared than ever before to promptly fill all orders with which they may be intrusted. The company control Caldwell's patents, and the statement is made that all buyers of flexible gas conducting tubing, with the large molded rubber end and nickel or brass ferrule, are liable to prosecution, as the same are alleged to be infringements on the Caldwell patents.

WE HAVE RECEIVED from the Michigan Stove Company during the week some of the advertising novelties which they are distributing. Among these are a Japanese fan, which bears on one side a copy of the company's trademark with appropriate inscriptions, also a piece of sheet music entitled "Afterwards," the words composed by Mary Mark Lemon and the music by John W. Mullin. The Michigan Stove Company are particularly active just now in calling the attention of the trade to their goods by means of these clever devices.

THE ART STOVE COMPANY of Detroit, Mich., have just completed a full line of new parlor stoves known under the name Laurel. The vertical flue construction has an attachment whereby it may be converted into a base burner, and the manufacturers state that a series of tests made with this stove developed something decidedly interesting in the way of results obtained. The heater gives promise of being a good seller, and the design ranks well with the new stoves now on the market.

THE STUART-PETERSON COMPANY, who, in May last, removed their works from Philadelphia, Pa., to Burlington, N. J., commenced work on orders within six weeks of leaving their old quarters. They are already finding their foundry too small for their largely increased business and will, in the fall, extend their buildings some 60 feet. They have also in contemplation the erection of a dry room for the storage of polished stock. This is a much needed department, owing to the liability of polished iron to rust when in the least exposed to atmospheric influences. The company are receiving bids for a wharf extension to be built this fall. When constructed it is proposed to fill it in with their own dumpage. The completion of the wharf will afford excellent facilities for water shipments. The company are furnishing employment for about 100 hands, but this number will have to be considerably augmented before long.

THE ECLIPSE STOVE WORKS of Mansfield, Ohio, resumed operations last week after a brief shut down for annual repairs, &c. We understand that the company are giving employment to a larger force than ever before.

ACCORDING TO THE LATEST ADVICES from Sioux City, Iowa, it is the intention to reorganize the stove works at Leeds and put the plant into active operation. A committee was recently appointed to secure the consent of the creditors to a plan of action, and it is stated that the members of it are meeting with gratifying success.

AT THE ANNUAL MEETING of the stockholders of the Somerset Stove Foundry Company, recently held in Somerset, Mass., John D. Flint was elected president for the ensuing year and William P. Hood, treasurer and general manager. The directors elected include John D. Flint, Hon. D. S. Stevens, Isaac T. Brownell, A. N. Lincoln, Alfred H. Hood and William P. Hood. The report presented at the meeting was very satisfactory, and after paying a dividend from the earnings of the past year of 6 per cent. a handsome surplus was left. In addition to their large line of ranges, which embrace the Harvest, Palace, Arion, Wyoming, Somerset, Grand and Grecian, the company are putting on the market an entirely new low-priced range called the Somerset Jewel. This stove embodies the improvements of first-class and higher-priced ranges and is expected to meet with a gratifying sale. The company are also making a full line of parlor air-tight stoves, and have remodeled the Superb, Arion and Vesta cook stoves. They employ only the best materials in their goods, as well as the highest skilled labor, the latter having been the former owners of the concern when it was known as the Somerset Co-operative Foundry Company.

BERGSTRON BROS & CO. of Neenah, Wis., send us a number of advertising blotters which they are distributing. These are neatly printed on one side with an illustration of some stove, its good points being also enumerated. The batch received covers the wood cottage stove Spark, the wood parlor stove Tacona, the Royal Oak, the New Elmhurst surface burner Nos. 14 to 18, and the New Elmhurst Nos. 20 to 22. An illuminated circular accompanies these blotters, giving points on the Royal line of oak stoves made by the firm. A decidedly convincing list of the advantages of this system is presented in the circular.

THE GOBEILLE PATTERN COMPANY, Cleveland, Ohio, are distributing among their friends in the trade copies of the official souvenir postal, on the back of which is a general view of the Manufactures and Liberal Arts Building at the Columbian Exposition, together with supplementary matter of an interesting character. On the lines intended for writing is the statement by the company that their shop is just as unlike all others as the postal card is different from the ordinary. In conclusion, the company say: "We make patterns better and cheaper than any other shop."

THE TROY OIL STOVE COMPANY of Troy, N. Y., have about ready for the trade a new oil heater, which they claim will be the "best and cheapest on the market." Its constructive features will be such that it may be used for both heating and cooking purposes, and as it will have a flat wick with central draft no engineer will be required to run it.

J. D. HIESTAND, manager of the Philadelphia office of the Keeley Stove Campany of Columbia, Pa., has just returned from a visit to the World's Fair, and is quite delighted with the Exposition. The Columbian line of stoves, ranges and furnaces will now have their merits extolled in a manner becoming the Columbian year and celebration.

KNOTT, HARKER & CO., Beaver Falls, Pa., have just moved their office and showrooms to a new two-story building 40 x 80 feet. The first floor will be used as a machine shop, which has windows for light under the work benches that run along one wall as well as above them. This will have a tendency to promote cleanliness and prevent the usual accumulation of odds and ends. The ceiling is very high and the windows are of a size to let in an abundance of light. On the second floor, which also has a very high ceiling, the offices occupy the front while the large space back is lighted by large windows some 6 feet above the floor. This space is divided into a number of smaller rooms where an elaborate display is made of mantels of marble, slate and wood, of grates, fenders, screens, fireplace linings, andirons, borders and summer pieces in plain, nickel and bronze finish, and a line of art tile that leaves little to be desired. These goods are the special feature of their business, though many castings are made in their foundry and considerable machine work is done for their customers. A large foundry and manufacturing plant right on the railroad adjoins the new building giving them excellent facilities for making, snowing and shipping a very handsome line of goods.

J. M. THATCHER, inventor of the well-known Thatcher furnace, died at Franklin, N. J., on July 19, while on a visit to his son, L. M. Thatcher, secretary of the Thatcher Furnace Company. Mr. Thatcher was 75 years of age. By his removal a familiar face will be missed from among the stove and furnace trade. He was, in fact, widely known throughout the United States, having been connected with these trades since his boyhood. Mr. Thatcher severed his connection with the Thatcher Furnace Company several years ago, and went to reside at Kansas City for the benefit of his health, which had become impaired by his busy life.

THE PETELER FURNACE COMPANY of Minneapolis, Minn., have recently issued from the press a neat little catalogue illustrating and describing their air-tube furnace. This is spoken of as scientifically correct in design and construction, and well adapted to the section of country in which it has been introduced. The device is shown in sectional view, and is described at some length in a way to render its features clearly understood. Attention is also invited to the company's hot water ventilating system, several points concerning which are fully set forth. A number of pages are devoted to what some of the manufacturers' customers say concerning their goods.

TRADE REPORT.

The Iron Market.

Stagnation characterizes the market along the whole line of Iron and Steel products in all sections of the country without exception. In some departments the condition of the industry is unprecedented. This is notably the case in the Lake Superior Ore district, which has never suffered as it is now doing. Other Ore districts, too, are feeling the pinch. The canceling of orders by customers has led to the closing down of mines in New York and New Jersey, and Lake Champlain Ores have been offered at exceptionally low prices.

In finished Iron and Steel the most telling event is the disagreement on the Western wages scale. At the present writing the outlook for an early adjustment does not look particularly brilliant. To the trade at large this will not be unwelcome news, since it cuts off some of the superabundant supply. The works directly affected have the choice of keeping closed down and losing trade, which really means very little, or of starting under the thumb of the Amalgamated Association.

Pig Iron.—The market in New York is lifeless, with occasional reports of concessions under fairly numerous special circumstances. Buyers are covering only immediate requirements, and these call for exceedingly quick delivery. We quote Northern brands at $14 50 @ $15 for No. 1; $13 75 @ $14.50 for No. 2; $12.25 @ $12.50 for Gray Forge, at tidewater. Southern Iron, same delivery, $13.75 @ $14 50 for No. 1; $12.50 @ $13.50 for No. 2; $12 @ $12.25 for No. 3; $12.25 @ $12.50 for No. 2 Soft, and $12.75 @ $13.25 for No. 1 Soft. Gray Forge remains $11.75 @ $12.50.

Not much business is being done in the Philadelphia market, but a steady tone is noticeable in quotations. The heavy decrease in production, coupled with light stocks, imparts confidence to holders of good brands; and, although it is hardly a time to talk higher prices, it is thought to be equally clear that prices will go no lower. Meanwhile business is being done at last quotations, which are as follows for Philadelphia and equivalent points, and from 20¢ to 30¢ less for Southern Irons at points accessible by water:

American Scotch, No. 1X...	$16.00	@	$16.50
American Scotch, No. 2X...	15.00	@	15.50

At Pittsburgh a few sales of Bessemer Pig have been made, which have forced the price of Bessemer in that market down to $13. The prospect of some business being done in Steel at an early date and the large falling off in production will, it is believed, favorably affect the market. Gray Forge and Foundry Irons are entirely neglected. Quotations are as follows:

No. 1 Foundry	13.50	@ 13.75	cash.
No. 2 Foundry	12.50	@ 12.75	"
Charcoal Foundry No. 1	17.00	@ 18 00	"
Charcoal Foundry No. 2	16.50	@ 17.00	"

Advices from Chicago report very little doing in Pig Iron in that market. Business is confined to customers who absolutely require Iron. Some inquiry, however, is stated to be coming from the country trade, who appear to be getting ready to buy. Very few furnaces are in operation in the vicinity, yet the supply of Pig Iron is considerably in excess of demand. There is absolutely no market for Lake Superior Charcoal Iron at present. The following quotations represent the regular asking prices, Chicago delivery, but they are subject to concessions according to circumstances:

Lake Superior Charcoal.....	$16.00	@	$16.25
Local Coke Foundry, No. 1...	13.50	@	14.00
Local Coke Foundry, No. 2...	12.75	@	13.00
Local Coke Foundry, No. 3...	12.50	@	12.75
Local Scotch.....	14.00	@	15.00
Ohio Strong Softeners.....	15.75	@	16.25
Southern Silvery, No. 1.		@	14.50
Southern Silvery, No. 2		@	14.00
Southern Coke, No. 2.....	12.75	@	13.00
Southern Coke, No. 3	12.25	@	12.50
Southern, No. 1, Soft.....	12.65	@	13.00
Southern, No. 2, Soft.....	12.25	@	12.50
Southern Gray Forge .. .	11.50	@	12.00
Tennessee Charcoal, No. 1....	16.50	@	17.00
Alabama Car Wheel.....		@	18.85
Coke Bessemer	14.50	@	15.00
Hocking Valley, No. 1	16 75	@	17.00
Jackson County Silvery.....	16.75	@	17.00

The Southern markets show no improvement in Pig Iron during the week, and yet there has been an increased volume of business, both for spot and forward delivery, the demand being mainly for single car lots of most kinds of Iron. There is scarcely any demand for Charcoal Iron, but Gray Forge Coke Iron is selling fairly well. Certain grades of Iron are scarce, and will become more so, and, with any easing in money, it is thought that prices will improve. Meanwhile, quotations are as follows:

Foundry.

Southern Coke, No. 1.	$13.00	@	$13.25
Southern Coke, No. 2.....	11.50	@	11.75
Southern Coke No. 3.....	11.00	@	11.25
Ohio Soft Stone Coal, No. 1....	16.00	@	16.25
Ohio Soft Stone Coal, No. 2....	15.00	@	15.25
Lake Superior Coke No. 1.....	15.00	@	15.25
Lake Superior Coke No. 2.....	14.00	@	14.25
Hanging Rock Charcoal, No. 1..	18.50	@	19.00
Hanging Rock Charcoal, No. 2..	17.50	@	18.00
Tennessee and Alabama Charcoal, No. 1.....	15.00	@	15.50
Tennessee and Alabama Charcoal, No. 2.....	14.00	@	14.50

It is expected that the improvements which the Baltimore & Ohio Railroad is making in West Virginia will develop large coal fields in that State.

Metal Market.

Pig Tin.—Speculative dealings during the past week involve a total of upward of 1000 tons, the greater portion on contracts for July and August delivery in settlement of old trades and against privileges. Purchases by distributors and consumers have been on a moderate scale. However, there is reason for the statement that, with proper allowance for the curtailment of consumption due to usual summer season dullness and extremely adverse financial conditions, to say nothing of the deliveries made since the 1st inst. on old contracts, stocks in first hands have been cut down considerably, making the statistical position much stronger than it was at the beginning of the month.

Copper.—The monetary situation still operates as a formidable obstruction in the way of improvement in the market for this metal. It curtails the home trade outlet and affects the foreign market perceptibly. As a popular quotation for Lake Superior Ingot, 10½¢ remains in force, but it is no secret that purchases can be made in some quarters at ⅛¢ @ ¼¢ ℔ lb less.

Pig Lead.—The market has weakened somewhat since the date of our last review and is at present in an uncertain shape, pending the solution of problems incidental to the silver agitation. A few sales have been made at 3.60¢ for early and 3.65¢ for more distant future shipment. Subsequently some lots were parted with at 3.55¢, and offerings at 3.60¢ were free enough to indicate that buyers have the upper hand to a great extent where deals involving more than single carloads are concerned.

Spelter.—There has been an uninterrupted downward turn in prices, with good Western brands selling in carload lots at from 4.15¢ down to 4¢, delivered, near future shipments, and fairly free offering at near the bottom figures at the close.

Antimony. — While not unusually large the arrivals have been sufficient to add to the accumulation here, and prices are easy in consequence. Ordinary jobbing lots out of store may be secured at 9¾¢ @ 9¾¢ for Hallett's, 10⅛¢ @ 10¼¢ for L X, and 10⅜¢ @ 10⅝¢ for Cookson's, on the spot.

Tin Plate.—Apart from ordinary small sales of spot stock and occasional orders for special sizes for near future delivery, there has been hardly any

business. The demand is quite as slow as it was at the beginning of the week, and, with liberal stock and good assortment, prices continue rather weak all along the line.

Chicago Report.

Scrap.—The following buying prices are quoted by dealers, but trade is very quiet.

	Per net ton.	Per lb
No. 1 Wrought Scrap	$10.00	....
Machinery Cast	7.50	....
Malleable Cast	7.00	....
Stove Plate (free of burnt)	5.00	....
Burnt Iron and Grate Bars	4.00	....
Sheet Iron and Hoops	3.00	....
Plow Steel and Breaking Stock	6.00	....
No. 2, such as Shovels, Hoes, &c	4.50	....
Old Boilers—whole (Iron)	6.00	....
" (Iron)—cut in single Sheets and Rings	9.00	....
Old Gas-Pipe and Boiler Tubes	6.00	....
Cast Borings	3.50	....
Turnings	5.00	....
Horseshoes	10 00	....
Copper Bottoms	....	7 ¢
Copper Clips and Heavy	....	8½¢
Heavy Brass	....	7½¢
Light Brass	....	4 ¢
Pipe Lead	....	3 ¢
Tea Lead	....	2½¢
Zinc	....	2¾¢
Rubber	....	2¾¢

Anthracite.—There is very little doing. Dealers quote carload lots of 12 net tons as follows:

	Grate.	Egg, Sto. and Ch.
Chicago, Ill	$5.85	$6.10
Milwaukee, Wis	5.85	6.10
Kansas City, Mo	9.05	9.30
Council Bluffs, Iowa	9.05	9.30
Lincoln, Neb	9.20	9.45
Sioux City, Iowa	9.05	9.30
Aberdeen, S. Dak	9.10	9.35
Dubuque, Iowa	7.15	7.40
Madison, Wis	7.35	7.60
St. Paul, Minn	8.35	8.60
Burlington, Iowa	7.35	7.60
Des Moines, Iowa	8.80	9.05
Davenport, Iowa	7.15	7.40
St. Joseph, Mo	9.05	9.30
Leavenworth, Kan	9.05	9.30
Omaha, Neb	9.05	9.30

Colorado Anthracite.

COLORADO FUEL & IRON COMPANY.

Denver	$8.00
Pueblo	8.00
Colorado Springs	8.00
Leadville	8.00
Cheyenne, Wyo	10.00
All points between Denver and Missouri River	9.35

ELSEWHERE in this issue John P. Schaffer of 18 Wood street, Pittsburgh, Pa., directs the attention of the trade to the Novelty Ventilated Wall Pipe for which he was granted patents some time ago. The statement is made that this Wall Pipe is manufactured of best Bright Tin, by machinery designed specially for the purpose, and is turned out in lengths varying from 1 inch to 8 feet. The joints are double seamed, and the pipe is constructed in such a manner that if it becomes necessary to shorten it this can be done simply by removing the socket end, cutting off the pipe and replacing the socket in a few moments. Mr. Schaffer has already furnished a large amount of this Wall Pipe, and we are advised that it has given excellent satisfaction wherever used. Attention is also directed to the fact that it is claimed to be absolutely fire proof, which adds very materially to its value.

CONDITION OF THE

Hardware Trade.

THE PAST WEEK has been uneventful in Hardware circles, with few and unimportant changes in price. Trade, as expected at this season, is quiet and owing to the financial conditions is of smaller volume than usual. Retailers, as indicated in the reports given in our last issue, which are confirmed by others which the pressure on our columns will not permit us to publish, are feeling the effect of the financial stringency to a greater or less extent, some of them, however, having, up to the present time at least, a good volume of business. Collections, however, on the whole, are difficult. It is, as yet, too early to expect the opening of fall trade. Business is, to a large degree, limited to small orders for special requirements. Travelers generally are at home. Jobbers are wisely refraining from efforts to force business. It is also the vacation season and many are giving their attention to pleasure and recreation. Manufacturers generally, as reported in our last issue, are diminishing their production, working either on short time, or for the time being closing their works. The improved feeling in financial affairs is a matter for congratulation and it is hoped that before long the conditions will be favorable to a resumption of business in good volume.

Advices from Chicago.—Hardware collections are still improving, but trade does not gain in volume. Jobbers state that they are now withdrawing their travelers, and some are cutting down their working force at home. Salesmen are told to take plenty of time to see the World's Fair. It is seen that under existing conditions it is useless to endeavor to force trade. Jobbers are scrutinizing credits very closely, and are often refusing to book orders, although desirous of making better sales. Manufacturers of Hardware are now making unusually low prices on some articles for spot cash. It is a great opportunity for those having ready money, but as usual, opportunities of this kind come when most people do not have cash to embrace them. The dullness is felt both in Shelf and Heavy Hardware, but the decline in business is not quite so great in Heavy Hardware, as the small consuming manufacturers appear to be still driving ahead, and are purchasing material in reasonably good quantities.

Notes on Prices.

Cut Nails.—Many of the mills are shut down for repairs and in order to avoid an accumulation of stock. The volume of business is small and transactions are limited for the most part to small lots which are required for early use. There is an entire absence of speculative buying. Quotations remain on a basis of $1.05 for car load lots at mill, a figure which is slightly shaded in special cases. Iron Nails are obtainable at a concession of 2 or 3 cents from the above figure. Small lots from store in New York are quoted at $1.30 @ $1.35.

Advices from Chicago.—Although the Cut-Steel Nail factories are shut down, as far as can be learned the market does not appear to be in the least affected. Orders are very slow about coming in, and, when received, call for only a carload or so at a time. Inquiries are extremely light, and there is no indication as yet of any improvement in this branch. Factory prices are continued at $1.20 @ $1.25 Chicago, while small lots from stock are selling at $1.30 regular and $1.25 for quantity.

Wire Nails.—There have been no important developments in the Wire-Nail market during the past week. Quotations remain on a basis of $1.35 for carload lots at mill. Manufacturers are not endeavoring to force sales and are adhering pretty closely to the above figure. It is understood, however, that it has in some cases been shaded.

Advices from Chicago.—Manufacturers are doing a carload business almost exclusively. Jobbers have stocked up well, and it will be some time before they are again in the market to renew their orders. The closing of the Wire-Nail factories is having increasing effect in breaking the stocks of manufacturers, and more of them are reported to be buying from each other in order to make up assortments. Prices have not stiffened, but are still quoted on the basis of $1.45, Chicago, for factory lots. Small lots from stock are selling at $1.60, and quantities at $1.55.

Barb Wire.—The Barb-Wire market is sluggish and unchanged. The volume of business is small and prices are surprisingly well maintained. We continue to quote $2.45 to $2.50 for carload lots of Four-Point Galvanized at mill. Small lots from store are held at about the usual advance.

Advices from Chicago.—Business is extremely light from factory and from jobber. Prices have been reduced, the consolidated Steel & Wire Company having issued a new card on the Baker Perfect Wire, naming carload lots Painted, $2.20, and Galvanized, $2.60, usual terms, 60 days, or 2 per cent. discount for cash; Annealed Staples, carloads, $2.20 for Painted, and $2.60 for Galvanized; Polished, 10 cents per 100 advance. Ordinary Standard Wire is quoted at $2.10 for Painted, and $2.50 for Galvanized, but concessions are made to the best trade. Small lots from stock are still quoted by jobbers at the old rate of $2.30 for Painted, and $2.70 for Galvanized, but there is almost nothing moving.

Wringers.—We give below revised prices on Wringers, issued under date July 1 by American Wringer Company, 99 Chambers street, New York. For

the convenience of the trade, changes are indicated in full-face type. Most of these, it will be observed, are in the way of reduction, though in some instances prices have been advanced. Terms, 60 days, or 2 per cent. discount for cash in ten days:

Iron Frame Wringers.

Name.	No.	Size of Rolls.	Price per doz.
Daisy.....	2	10 x 1¾	$16.00
"	3	11 x 1¾	20.00
"	4	12 x 1¾	24.00
Handy.....	2	10 x 1¾	16.00
"	3	11 x 1¾	20.00
"	4	12 x 1¾	24.00
The A. W. Co.	2	10 x 1¾	17.00
"	3	11 x 1¾	21.00
"	4	12 x 1¾	25.00
"	5	14 x 1⅞	34.00
"	6	16 x 2	43.00
Magic.....	2	10 x 1¾	21.00
"	3	11 x 1¾	25.00
"	4	12 x 1¾	29.00
Sherman.....	4	12 x 2	72.00
"	5	14 x 2	96.00
Eureka.....	2	10 x 1¾	19.00
"	3	11 x 1¾	23.00
"	4	12 x 1¾	27.00
"	5	14 x 1⅞	36.00
"	6	16 x 2	45.00
Superior.....	2	10 x 1¾	18.00
"	3	11 x 1¾	22.00
"	4	12 x 1¾	26.00
"	5	14 x 1⅞	35.00
"	6	16 x 2	44.00
Superior, with Relief Screws.	2	10 x 1¾	20.00
"	3	11 x 1¾	24.00
"	4	12 x 1¾	28.00
"	5	14 x 1⅞	37.00
"	6	16 x 2	46.00

Wood Frame Wringers.

Rival.....	10	10 x 1¾	$18.00
"	11	11 x 1¾	22.00
"	12	12 x 1¾	26.00
Household.....	10	10 x 1¾	18.00
"	11	11 x 1¾	22.00
"	12	12 x 1¾	26.00
Novelty.....	10	10 x 1¾	20.00
"	11	11 x 1¾	25.00
"	12	12 x 1¾	30.00
"	20	10 x 2	30.00
"	30	11 x 2	39.00
"	40	12 x 2	48.00
"	50	14 x 2	66.00
"	2	10 x 1¾	20.00
"	3	11 x 1¾	25.00
"	4	12 x 1¾	30.00
"	22	10 x 2	30.00
"	33	11 x 2	39.00
"	44	12 x 2	48.00
"	2½	10 x 1¾	20.00
"	3½	11 x 1¾	25.00
"	4½	12 x 1¾	30.00
"	22½	10 x 2	30.00
"	33½	11 x 2	39.00
"	44½	12 x 2	48.00
Imperial.....	XX2½	10 x 1¾	19.00
"	XX1½	11 x 1¾	23.00
"	XX1¾	12 x 1¾	27.00
Volunteer.....	10	10 x 1¾	20.00
"	11	11 x 1¾	25.00
"	12	12 x 1¾	30.00
Relief.....	110	10 x 1¾	23.00
"	111	11 x 1¾	28.00
"	112	12 x 1¾	33.00
"	120	10 x 2	33.00
"	130	11 x 2	42.00
"	140	12 x 2	51.00
Conqueror	2½	10 x 1¾	24.00
"	1½	11 x 1⅞	34.00
Excelsior.....	E	10 x 1¾	29.00
"	F	11 x 1¾	34.00
"	G	12 x 1¾	39.00
"	EE	10 x 2	39.00
"	FF	11 x 2	48.00
"	GG	12 x 2	57.00
"	H	12 x 2½	92.00
"	HH	14 x 2½	117.00
"	JJ	16 x 3	240.00
"	KK	18 x 3½	325.00
Universal....	2½	10 x 1¾	20.00
"	2	10 x 1⅞	24.00
"	1¼	11 x 1¾	25.00
"	1½	11 x 1⅞	30.00
"	1¾	12 x 1¾	30.00
"	1	12 x 2	48.00
"	14	14 x 2	66.00
"	A2½	10 x 1¾	29.00
"	B1½	11 x 1⅞	39.00
"	C1	12 x 2	57.00
"	D8	14 x 2¼	112.00
"	BX1½	11 x 1⅞	42.00
"	CX1	12 x 2	60.00
"	DX8	14 x 2¼	115.00

Name.	No.	Size of Rolls.	Price per doz.
Universal.....	8	14 x 2¼	112.00
"	12	14 x 3¼	208.00
"	18	17 x 2¼	254.00
"	22	17 x 3¼	336.00
Empire.....	3	10 x 1¾	32.00
"	4	11 x 1¾	38.00
"	4½	11 x 1¾	41.00
"	5X	12 x 1¾	44.00
"	5	12 x 1⅞	47.00
"	14X	14 x 1⅞	78.00
"	11½	11 x 1⅞	56.00
"	12½	12 x 1⅞	62.00
"	16X	16 x 2	106.00
"	14	14 x 2¼	117.00
"	16	16 x 2½	172.00
"	14P	14 x 2¼	153.00
"	16P	16 x 2½	208.00
"	40	11 x 1⅞	47.00
"	50	12 x 1⅞	53.00
"	5A	12 x 2¼	92.00
"	14A	14 x 2¼	117.00
Welcome.....	20	10 x 1¾	24.00
"	30	11 x 1¾	29.00
"	40	12 x 1¾	34.00
"	22	10 x 2	34.00
"	33	11 x 2	43.00
"	44	12 x 2	52.00
"	20½	10 x 1¾	24.00
"	30½	11 x 1¾	29.00
"	40½	12 x 1¾	34.00
"	22½	10 x 2	34.00
"	33½	11 x 2	43.00
"	44½	12 x 2	52.00
"	E	10 x 1¾	33.00
"	F	11 x 1¾	38.00
"	G	12 x 1¾	43.00
"	EE	10 x 2	43.00
"	FF	11 x 2	52.00
"	GG	12 x 2	61·00
Keystone.....	10	10 x 1¾	20.00
"	16	11 x 1¾	25.00
"	18	11 x 1⅞	30.00
"	20	11 x 2	39.00
"	22	12 x 1⅞	39.00
"	24	12 x 2	48.00
Royal Keystone.....	A	10 x 1¾	30.00
"	B	11 x 1⅞	36.00
"	C	12 x 2	46.00

Bench Wringers.

Household.....	A	10 x 1¾	33.00
"	B	11 x 1¾	37.00
"	C	12 x 1¾	41.00
Excelsior.....	XA	10 x 1¾	37.00
"	XB	11 x 1¾	42.00
"	XC	12 x 1¾	47.00
"	XAA	10 x 2	47.00
"	XBB	11 x 2	56.00
"	XCC	12 x 2	65.00
Universal.....	AA2½	10 x 1¾	37.00
"	BB1½	11 x 1⅞	47.00
"	CC1	12 x 2	65.00
Keystone.....	40	10 x 1¾	30.00
Gem.....	4	10 x 1¾	36.00
"	8	11 x 1¾	41.00
"	16	12 x 1¾	46.00
Welcome.....	XA	10 x 1¾	41 00
"	XB	11 x 1¾	46.00
"	XC	13 x 1¾	51.00
"	XAA	10 x 2	51.00
"	XBB	11 x 2	60.00
"	XCC	12 x 2	69.00
Empire.....	3	10 x 1¾	47 00
"	4	11 x 1¾	53.00
"	4½	11 x 1⅞	56.00
"	5	12 x 1⅞	62.00

Jack Chain.—A revised list of Brass and Iron Jack Chain has been adopted by the principal manufacturers of this line of goods. The list in its present form corrects the inequalities of the list adopted last March. No changes have been made in the prices of Safety Chain. The present list on these goods bears date July 10, and is subject to a discount of 60 per cent.

Odorless Stew and Fry Pan.—This pan has been put on the market by the Wilmot & Hobbs Mfg. Company, 20 Murray street, New York, and Bridgeport, Conn. It is sold to the trade at $1.25 each, subject to a discount of 50 per cent.

Glass.—The Glass market continues quiet and without noteworthy features. Stocks of Window Glass, while not large, are probably sufficient to meet the demand during the present shut down of the factories. The outlook for fall trade is regarded by some as very encouraging, confidence being expressed that a business of gratifying proportions will then be done. These observers make the point that the present slowness is not due so much to overproduction as to the fact that many projected enterprises have been suspended or retarded by the existing financial difficulties. Others, however, refer to the future in a less hopeful vein. The meeting of the Wage Committee of the Glass workers and the manufacturers which was announced to take place today has been deferred, and it is likely that it will not be held before next month. The demand for American Plate Glass is somewhat sluggish, although stocks are being perceptibly reduced. There is perhaps a slight improvement in the demand for imported Glass and collections are also said to be somewhat better than for some time past. Quotations on Glass remain unchanged, as follows: American Window Glass, 2000 boxes at one time, 80 and 10 and 10 per cent. discount; carloads, 400 boxes, 80 and 15 per cent. discount; less quantities than carloads, 80 and 10 per cent. discount. Freight allowed on car lots and over, not to exceed 17½ cents per 100 pounds; less than car lots, f.o.b. at shipping point. French Window Glass, 75 and 10 and 5 per cent. discount. American Plate ranges in price from 50 and 10 and 7½ per cent. discount to 60 and 5 per cent. discount. Imported Plate Glass, 60 per cent. discount to 60 and 10 and 5 per cent. discount.

Old Rubber.—The following are the current prices paid for Old Rubber delivered in New York:

Car Springs, ton lots, ₩ lb.	@	$0.03¼
Rubber Shoes, carloads ₩ lb.....	@	.03⅛
Rubber shoes, less than carloads.	@	.03
Large Hose, ₩ ton.....	@	9.00
White Wringer Rolls, ₩ lb.....	@	.04¼
White Syringes, ₩ lb.....	@	.05

Old Rags, Paper, &c.—The following are the current prices quoted for Old Rags, Paper, &c., delivered in New York:

No. 1 White Rags.....	₩ lb	3	@ 3⅛¢
No. 2 White Rags.....	₩ lb	2	@ 2⅛¢
Mixed Rags.....	₩ lb		1¼¢
Blues and 3ds.....	₩ lb		1¼¢
Hard Sized White Shavings	₩ lb		2¾¢
No.1 White Book Shavings	₩ lb	2¼	@ 2⅜¢
No.2 White Book Shavings	₩ lb	1½	@ 1¾¢
Light Book Shavings.....	₩ lb	⅛	@ 1¢
No. 1 Mixed Shavings. ...	₩ lb		1¢
No. 2 Mixed Shavings....	₩ lb		½¢
No. 1 Printed Books	₩ lb	1	@ 1¼¢
Ordinary Mixed Books....	₩ lb	½	@ ¾¢
Newspapers	₩ lb		½¢
No. 1 Manila Paper.....	₩ lb	1⅛	@ 1⅜¢
No. 2 Manila Paper.....	₩ lb	⅞	@ 1 ¢
Bogus Paper.....	₩ lb	⅝	@ ¾¢
Common Paper.....	₩ lb	⅜	@ ½¢
Straw Chips.....	₩ lb	½	@ ⅝¢
Binders' Clippings.....	₩ lb	½	@ ⅝¢
Jute Butts.....	₩ lb		1⅛¢
No. 1 Jute Bagging.....	₩ lb	1¼	@ 1⅜¢
Mixed Bagging.....	₩ lb		1¢
No. 2 Bagging.....	₩ lb		¾¢
Hemp Twine..... ...	₩ lb		2¼¢
Manilla Rope.....	₩ lb		2¼¢
Jute Rope	₩ lb	1½	@ 1¾¢
Mixed Rope.....	₩ lb	¾	@ ⅞¢

Old Metals.—The following are the current quotations for Old Metals in New York:

Heavy Copper	℔	9½¢
Light and Tinned Copper	℔	8½¢
Heavy Brass	℔	7¢
Light Brass	℔	6¢
Lead	℔	3½¢
Tea Lead	℔	3¼¢
Zinc	℔	2¾¢
No. 1 Pewter	℔	14¢
No. 2 Pewter	℔	7¢
Wrought Scrap Iron	gross ton,	$13.00
Heavy Cast Scrap	gross ton,	9.00
Stove Plate Scrap	gross ton,	6.00
Burnt Iron	gross ton,	4.00
Mixed Bagging	℔	1 ¢
No. 2 Bagging	℔	¾¢
Hemp Twine	℔	2½¢
Manila Rope	℔	2¾¢
Jute Rope	℔	1¾ @ 2 ¢
Mixed Rope	℔	¾ @ ⅞¢

Trade Notes.

CHARLES WEILAND has recently taken possession of his new quarters at 149 Chambers street, three doors below his former stand, having leased the entire building, containing in all seven floors 22 x 70 feet each. In addition to the jobs in Hardware, Tools, &c., heretofore dealt in, a line of Blue and White and Gray Steel Enameled Ware for kitchen and housekeeping purposes has just been taken on. He recently purchased 1500 cases of the Haberman Mfg. Company at auction in this class of Ware.

WADDEL WOODEN WARE WORKS, Greenfield, Ohio, are manufacturing a combination Paper Weight, Puzzle and Game, which they designate "Nip and Tuck." "Nip and Tuck" is a recent invention of Mr. Waddel. The device is referred to as beautiful in design and finish, and attention is called to it as an excellent advertising medium as well as an article of sale.

A NEW Copper and Brass Goods house has been established in Chicago by the Mortimer McRoberts Company. Mortimer McRoberts, the president of the company, has long been known to the Western Hardware trade. M. H. Kiebel, the secretary, and S. Rose, the treasurer, are also men of experience and wide acquaintance. Associated with them are F. E. Pomeroy and J. P. McCreedy. They opened temporary quarters at 90 Market street, Room 305, but will hereafter be located at 230 Lake street, where they will carry Sheet and Roll Brass and Copper, Brass and Copper Wire, Bare and Insulated Electric Wire, Rods, Tubing, Rivets, Pins, Chains, Lamps, Lamp Trimmings, Shades, Wick, Oil Cans, Furniture Trimmings and Sheet Metal Goods in great variety, being direct and sole representatives of leading manufacturers.

GEORGE GNAU, for many years past representing the interests of the Cincinnati Stamping Company, has resigned his position as traveling salesman and will hereafter represent the well-known tinners' supply house of Mathai, Ingram & Co., Baltimore, Md. Mr. Gnau will cover the same territory as in the past, making his headquarters at Cincinnati.

THE BELLAIRE STAMPING COMPANY of Harvey, Ill., call attention in another part of this issue to the Columbian Enameled Ware which they manufacture. Reference is made to seamless Drip Pans, Zinc Oilers, and Plain Stamped and Retinned Ware.

"THE TAYLOR ROOFING TIN" is the subject of an announcement published elsewhere in this issue by the N. & G. Taylor Company of Philadelphia. This roofing Tin is said to be very heavily coated and made of the finest quality of rehammered Siemens-Martin Soft Steel. The coating is referred to as being uniformly and evenly distributed over the entire sheet by a special process, and that each sheet is stamped with brand and thickness.

FERNANDO B. SMITH, Canton, Ohio, keeps quite a large force of tinsmiths busy turning out Smith's Patent Force Sprinkler and Novelty Pump, which is made of tin and furnished with several different nozzles and roseheads for spraying trees, vegetables or washing windows and carriages. A circular sent with the Pump explains its use and gives a number of safe recipes for fluids for the destruction of insects.

Mineral Wealth of South Africa.

In a paper read a short time ago before the British Society of Arts, in London, Bennett H. Brough, in describing the mining industries of South Africa, stated that of diamonds alone $3,600,000,000 worth have been mined in that region during the past 20 years. Gold was first mined in the Transvaal about five years ago, and already the output has been $42,500,000, while it is expected shortly to reach over $20,000,000 annually, exclusive of the products of Mashonaland and other parts of the country. But it is not in these precious minerals alone that South Africa's mineral wealth consists. We learn that her coal fields are of vast extent, although the coal industry is still in its infancy. Of copper 20,000 tons are produced yearly, and many other metals occur in great abundance. At an exhibition lately held at Kimberly, the capital of the diamond fields district, some extraordinary examples of minerals were shown, as well as some relics from the interesting ruins of Zimbabye, which have puzzled archæologists on account of the evidence they give of the existence of an advanced condition of civilization in that part of Africa in very ancient times. Among these exhibits was a mold for a gold ingot exactly of the shape of the tin ingot dredged up from Falmouth harbor, Cornwall, in 1811, and which corresponded with the form of ingot described 1900 years ago by the historian Diodorus Liculus. There is, says Mr. Brough, reason to suppose that the Phœnicians who pushed their adventurous barks to the distant British Isles and dropped the ingot in Falmouth harbor, were also responsible for the remarkable ruins of Zimbabye. In spite of its enormous mineral resources, however, Mr. Brough cautions those who may be tempted to try their fortune in South Africa that the supply of white labor there is already in excess of the demand. Skilled workmen are, however, well paid in the towns.

We have been favored by the State Board of Health, Lansing, Mich., with a copy of the eighteenth annual report of the board for the year 1890. The statistics given therein in relation to diseases in the State of Michigan are very extensive, and will be valuable to sanitarians. Interesting papers are included in the report on the "Principal Meteorological Conditions in Michigan" and on "The Time of Greatest Prevalence of Particular Diseases." Casualties from the use of gasoline form the subject of a special table. These amounted to nine in the whole State during the year, nearly all of which were the result of carelessness in handling the oil.

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Metal and Miscellaneous Prices.

See Standard Lists on Following Pages.

CHICAGO, JULY 20, 1893.

Tin—

Straits pigs.....22¢

Imported Tin Plates—

Charcoal Plates.—Bright.

Guaranteed Plates command special prices, according to quality.

		Per box.
Calland and Melyn Grade	IC, 10 x 14.....@	$6.75
	IC, 12 x 12.....@	6.75
	IC, 14 x 20.....@	6.75
	IC, 20 x 28.....@	13.50
	IX, 10 x 14.....@	8.75
	IX, 12 x 12.....@	8.75
	IX, 14 x 20.....@	8.75
	IX, 20 x 28.....@	17.50
	DC, 12½ x 17.....@	6.50
	DX, 12½ x 17.....@	8.50
Allaway Grade,	IC, 10 x 14.....@	6.50
"	IC, 12 x 12.....@	6.50
"	IC, 14 x 20.....@	6.50
"	IC, 20 x 28.....@	13.00
"	IX, 14 x 20.....@	8.00
"	IX, 20 x 28.....@	16.00

Coke Plates—Bright.

	Per box.
Steel Coke—IC, 10x14.14x20.85.85 @	$6.00
IC, 14x20.90 ℔	5.60 @ 5.75
IC, 14x20, 100 ℔	@ 5.85
10 x 20	8.75 @ 9.00
20 x 28	11.70 @12.00
X, 10x14, 14 x 20	@ 7.50
B.V. Grade. IC, 10x14, 14x20.5.85 @	6.00

Charcoal Plates.—Terne.

Guaranteed Plates command special prices, according to quality.

Mansel and Dean Grades.—	
IC. 14 x 20	..@ $5.62½
" 20 x 28	.....@ 11.25
IX. 20 x 28	.....@ 14.25
Worcester Brand and equal.—	
IC, 14 x 20	6.12½@ .....
IC, 20 x 28	12.25 @ .....
IX, 14 x 20	7.62½@ .....
20 x 28	15.25 @ .....

American Tin Plates.

Charcoal Plates.—Bright.

Irondale, A. A.—IC, 14 x 20	$7.00
" " IX, 14 x 20	9.00
" " IXX, 14 x 20	11.00
" " IC, 20 x 28	14.00
" " IX, 20 x 28	18.00
" " IXX, 20 x 28	22 00
Florence.—	
IC, 10 x 14, 12 x 12, 14 x 20	6.75
IX, 10 x 14, 12 x 12, 14 x 20	8.75
Palma.—	
IC, 10 x 14, 12 x 12, 14 x 20	7.50
IX, 10 x 14, 12 x 12, 14 x 20	9.50

Each extra cross $2.00 and 20 x 28 double these prices.

Brilliant, Tissue Packed, IC, 14 x 20	$9.25
Royal, extra, IC, 14 x 20	7.25
Merton, IC, 14 x 20	7.00
Almond, IC, 14 x 20	6.50
Mint, IC, 14 x 20	6.25

Coke Plates.—Bright.

Elwood.—IC, 14 x 20	$6.00
" IC, 20 x 28	12.50

Roofing Plates.

Arch (205 ℔), 20 x 28	@$11.75
Palm (205 ℔), 20 x 28	@ 12.25
Crescent, IC, 20 x 28	@ 12.50
Crescent, IX, 20 x 28	@ 15.75
Empire, IC, 20 x 28	@12 75
" IX, 20 x 28	@16.00
Hickory, IC, 20 x 28	@ 13.00
" IX, 20 x 28	@ 16.10
Alaska (heavily coated), IC, 20x28	@$14.50
Alaska IX, 20 x 28	@ 17.75
Special, IC, 20 x 28	@ 15.00
" IX, 20 x 28	@ 18.25
Merchant's Roofing (extra coated), IC, 20 x 28	@$17.75
Merchant's Roofing (extra coated), IX, 20 x 28	@$21.50
Merchant's Old Method, (extra heavily coated), IC, 20 x 28	@$19.75
Merchant's Old Method (extra heavily coated), IX, 20 x 28	$23.60
Irondale A:	
IC, 14 x 20	$6.25
IX, 14 x 20	7.75
IC, 20 x 28	12.50
IX, 20 x 28	15.50
Westmoreland:	
IC, 14 x 20	$6.25
IC, 20 x 28	12.50
Elwood:	
IC, 20 x 28	$12.00
Juno:	
IC, 14 x 20	$5.75
IC, 20 x 28	11.50
Scott's Extra Coated, Stamped and Resquared, IC, 14 x 20	$9.50
Scott's Extra Coated, Stamped and Resquared, IX, 14 x 20	11.00
Scott's Extra Coated, Stamped and Resquared, IC, 20 x 28	19.00
Scott's Extra Coated, Stamped and Resquared, IX, 20 x 28	22.00
Neville, Stamped, IC, 14 x 20	6.25
" " IX, 14 x 20	7.50
" " IC, 20 x 28	12.50
" " IX, 20 x 28	15.00
Taylor's Old Style, IC, 14 x 20 (Stamped and Resquared)	$9.50
Taylor's Old Style, IC, 20 x 28 (Stamped and Resquared)	19.00
Taylor's Roofing, IC, 14 x 20 (Stamped and Resquared)	8.25
Taylor's Roofing, IC, 20 x 28 (Stamped and Resquared)	16.50
Columbia, IC, 14 x 20 (Stamped)	7.25
" IC, 20 x 28 (Stamped)	14.50
Globe, IC, 14 x 20	6.00
" IC, 20 x 28	12.00
Miami, IC, 14 x 20	6.00
" IC, 20 x 28	12.00
" IX, 20 x 28	15.00
" (Redipped), IC, 20 x 28	17.00

Tin Boiler Plates.

	Per box of 100 sheets.	Per box of 112 sheets.
X, 14 x 28	$13.00	$13.00
XX, 14 x 28	14.50	14.50
X, 14 x 31	14.50	15.80
XX, 14 x 31	16.50	17.50

	Per box of 56 sheets.
X, 14 x 56	29.50	16.50
XX, 14 x 56	32.50	18.20
X, 14 x 60	31.50	17.65
XX, 14 x 60	35.50	20.90

Sheet Iron—

Black.

	Common American	Refined.
Nos. 10 to 16	℔ 2 7-10¢	3 3-10¢
17 to 20	℔ 2 8-10¢	3 4-10¢
21 to 24	℔ 2 9-10¢	3½¢
25 and 26	℔ 3¢	3 6-10¢
27	℔ 3 1-10¢	3 7-10¢

Russia, Planished, &c.

Genuine Russia, all numbers....13¢ net.
Patent Planished....℔ A, 10¼¢; B, 9¼¢ dis. 5%

Galvanized.

List on following page.
Juniata or first quality.....dis. 70&5%

Copper—

Ingot.

Lake.....11¾¢ @ 12¼¢
Casting Brands.....11¢ @ 11½¢

Sheet and Bolt.

List on following page. Discount to retailers, 25%.

Copper Bottoms.

List on following page. 25%.

Seamless Brass and Copper Tubes.

Base price, 17½¢, Chicago, with extras according to size.

Copper, Bronze and Gilding Tube, 3¢ ℔ ℔ additional.

Brazed Brass Tubing.
(To No. 20 inclusive.)

Add freight from New York to Chicago to these prices, or 50¢ ℔ 100 ℔.

Above 5-16 inch to 3 inch inclu	35¢
Plain, above 3 inch	45¢
Plain, 5-16 inch	45¢
Plain, ¼ inch	60¢
Plain, 3-16 inch	$1.00
Plain, ⅛ inch	$1.50
Fancy Tubing, Brass, to No. 20 incl	43¢ ℔
Bronze Tubing, 3¢ ℔ ℔ more than Brass	

35 @ 40 %

Roll and Sheet Brass.

List on following pages. 35 @ 40%.

Slab Spelter—

Western Spelter.....5

Sheet Zinc—

600 ℔ casks.....6¼¢
Less than Casks, ℔ ℔.....6½¢

Lead—

Sott Pig Lead.....4½¢
Bar.....4.60¢@5¢
Pipe.....5½¢, dis. 10¢
Block Tin Pipe.....35¢
Sheet.....6¢, dis. 10%

Solder—

½&½.....13¼¢@13⅞¢
Extra Wiping.....12¢

The prices of the many other qualities of Solder in the market indicated by private brands vary according to composition.

Antimony—

Cookson.....12½¢@13½¢
Hallett's.....11½¢@12½¢

Wire—See *Hardware.*

Wrought-Iron Pipe—

List on following page.

1¼ and under, Plain	60&10%
1¼ and under, Galv	52½&10%
1½ and over, Plain	70&10%
1½ and over, Galv	60&10%
Boiler Tubes, list Oct. 24, 1892	65@67½%
Casing, list Nov. 16, 1892	52½%
Inserted Joints Casing, list Nov. 16, 1892	47½%
Steel Boiler Tubes	27½%
Cold Drawn Seamless Steel Tubing	50%

Cast-Iron Soil Pipe—

Cast-Iron Soil-Pipe, Tarred; sizes 2 to 6 inches, inclusive.....dis 70&2½%
Other sizes.....dis 60%

Leader Pipes—

Abendroth's Galv'd Spiral Riveted	60%
Austin's Corrugated	60%
Gordon & Gilbert's Corrugated	60%
Ritchie's (Galv. Iron only) Cor'd	60%
Ritchie's Spiral Lock Seam, Galv'd	55%
Austin's Spiral Ribbed Pipe	60%
Plain Adjustable Elbows	60%
James A. Miller Bros. (Galv'd Iron only) Corrugated	60%

Furnace Fittings—

Discount from Excelsior Steel Furnace Co's list.....50%

Steel Roofing—

Perfection	$3.75 square
Climax	$3.50 square
The Lloyd Spanish Tiling	$4.50 square

Metallic Shingles—

Cushman's	$1.25 square
Merchant & Co.'s Spanish Tiles:	
Copper, 14 oz.	$36.00 square
Steel, painted	$9.00 square

Drain Pipe—

Discount from list.....50%

Paints, Oils, &c.—

Deodorized Benzine	7½@8
Iron Paint, Bright Red	℔ lb, 2
" " Brown	℔ lb, 1½
" " Purple	℔ lb, 2½
" Ground in oil, B. Red	℔ lb, 6½
" Ground in oil, Red	℔ lb, 6½
" Ground in oil, Brown	℔ lb, 5½
" Ground in oil, Purple	℔ lb, 6
Linseed Oil, Boiled, in bbls	53
Linseed Oil, Raw, in bbls	50
Mineral Paints	2@4
Orange Mineral	10½
Pure White Lead in Oil	6¾@7½
Dry White Lead in bbls	6½@6¾
Red Lead, American	7@7½
Red Venetian, English, dry	$1.65@$1.70
Red Venetian in oil; asst'd cans, 8½¢; kegs	7½
Sipe's Japan Oil, in bbls, ℔ gal	34
Spirits Turpentine, in bbls., ℔ gal	34½
Asphaltum, Trinidad Refined, ℔ ton	$45
Tarred Felt, 1 Ply, ℔ 100 ℔	$1.65
Tarred Felt, 2 Ply, ℔ roll 108 sq. feet	$1.50
Tarred Felt, 3 Ply, ℔ roll of 108 sq. feet	$2.00
Roofing Pitch, ℔ bbl. of 300 ℔	$3.20

NEW YORK, JULY 21, 1893.

Aluminum—

No. 2 Grade Metal, in ton lots..℔ ℔, $0.75
No 1 (guaranteed to be 98 % pure and over), in ton lots .....℔ ℔ .90
Lots less than 1 ton, 10¢ ℔ ℔ additional.

Antimony—

Cookson .....℔ ℔, 11¢
Hallett's.... .....℔ ℔, 10½¢

Brass—

Planished.....net
Roll and Sheet.....35@40%

Brass and Copper Tubes
Brazed Brass Tubing—

List May 20, 1889.

	Per ℔.
Plain, to No. 20 inclusive, above 5-16 inch to 3 inch inclusive	$0.35
Plain, to No. 20, above 3 inch	45
Plain, 5-16 inch to No. 20	45
Plain, ¼ inch	60
Plain, 3-16 inch	1.00
Plain, ⅛ inch	1.50
Fancy Tubing to No. 20, inclu	43

35@40%

Copper and Bronze Tubing—

3¢ ℔ ℔ more than brass.

Bronze, Tobin—

Drawn Rods for Bolts, Forgings, &c

Over ¼ to 3½ inches inclusive....17¢ ℔ ℔
Over 3½ to 5 inches inclusive.....18¢ ℔ ℔

Piston Rods, Finished True, Smooth and Straight.

Over ¼ to 3½ inches inclusive....18¢ ℔ ℔
Over 3½ to 5 inches inclusive.....19¢ ℔ ℔

Clips—

Buffalo Damper: Nos. 1, $1.25; 2, $2.50 per doz.....40&10%

Conductors—

Corrugated. *Round or Square—*

Galvanized	60%
Galvanized, Locked Joints	60%
Tin	60%

Spiral Riveted—

Galvanized.....50%

See also *Elbows and Shoes; Eave-Trough Miters; Strainers, Conductor.*

Conductor Strainers—See *Strainers, Conductor.*

Copper—

Bottoms, Pits and Flats.....15@25%

Ingot.

Lake.....11½¢
Ansonia Grade Arizona.....11¢
Ansonia Grade Casting.....10½¢
Planished......net
Sheet and Bolt......25@30%

Tubes—See *Seamless Brass Tubes.*

Coppers, Soldering—

See *Irons, Soldering*, in Current Hardware Prices.

Damper Clips Buffalo—

See Clips, Buffalo Damper.

Eave Troughs—

Lap or Slip Joint, Galvanized.....60%
Lap or Slip Joint, Terne.....50%

Eave-Trough Mitres—

Lap or Slip Joint.....list, net

Elbows—
Plain Adjustable—

Tin.....70%
Galvanized.....70%

Crimped Tubing—

Re-Tinned or Galvanized.....35%

Stove-Pipe—

Buffalo Four-Piece.

4	5	5½	6	7 inch,
$0.78	.87	.90	.99	1.20 per doz..20 %

Elbows and Shoes—
Flat Crimp.

Tin.....35%
Galvanized.....35%

Corrugated.
Flat Crimp.

Galvanized.....60%

Round or Square.

Tin.....60%
Galvanized.....60%

Iron, Sheet—

Black.

	Common American.	R. G. Cleaned American.
Nos. 10 to 16	℔ lb, 2¾@	3¼¢
Nos. 17 to 20	℔ lb, 3 @	3¼¢
Nos. 21 to 24	℔ lb, 3¼@	3½¢
Nos. 25 and 26	℔ lb, 3⅝@	3⅝¢
No. 27	℔ lb, 3⅝@	3¾¢
No. 28	℔ lb, 3⅝@	3⅞¢
American B. B.	℔ lb, 4¢@4½¢	

Russia, Planished, &c.

Genuine Russia, according to assortment.....℔ lb, 12@13¢
Patent Planished....℔ lb, A, 10¢; B, 9¢, 5%
Craig Polished Sheet.....℔ lb, 8½¢

Galvanized.

	B. B.
Nos. 10 to 16	℔ lb, 4¢
Nos. 17 to 22	℔ lb, 4¼¢
Nos. 23 to 24	℔ lb, 4½¢
Nos. 25 to 26	℔ lb, 4⅝¢
No. 27	℔ lb, 5¢
No. 28	℔ lb, 5¼¢
Nos. 29 and 30	℔ lb, 6¼¢

Filter Joints—

Lee's.....33⅓ %

Lead—

American Pig..... 4¢
Bar..... 4½¢

New York Prices.

Pipe.....6¼¢, 20%
Tin Lined Pipe.....15¢, 20%
Block Tin Pipe.....37½¢, 20%
Sheet.....7¢, 20%
Old Lead in exchange, 3¼¢ ℔ lb.

Pittsburgh Prices.

Lead Pipe in whole coils, ℔ lb, .05¢, 10&5%
Sheet Lead in whole coils, ℔ lb, .05½¢, 10&5%

Metal, Expanded—
Manufacturers' list No. 5.

Lathing	10%
Fencing, Painted Sheets	20%
Netting, Painted Sheets	20%
Door Mats, Galvanized	25%
Window Guards, Paneled	15%
Tree Guards, Paneled	15%

Mitres Eave-Trough—See *Eave-Trough Mitres.*

Paints Oils &c.—

Lead, Amn. White, Dry or in oil:	
Kegs, lots less than 500 lb	7 @ 7¼
Kegs, lots 500 lb to 5 tons	6⅝ @ 6¾
Kegs, lots 5 tons to 12 tons	6⅜ @ 6⅝
Kegs, lots 12 tons and over	6¼ @ 6⅜
Lead, White, in oil, 25 ℔ tin pails, add to keg price	@ ⅛
Lead, White, in oil, 12½ ℔ tin pails, add to keg price	@ 1
Lead, Red, bbls. and ½ bbls	6 @ 7
Lead, Red, kegs	6¼ @ 7¼
Ocher, American	½ @ 1½
Red, Venetian, American ℔ 100 ℔	1.00 @ 1.10
Linseed Oil:	
City, raw, ℔ gal	@ .50
City, boiled	@ .53
Western, raw	@ .50
Spirits Turpentine:	
In regular bbls	28½ @ .29
In machine bbls	29 @ .29½
Putty:	
In barrels and ½ bbls	.01¾ @ .01¾
In tubs	.01¾ @ .01¾
In tin cans	.01¾ @ .02¼
In bladders	.01¾ @ .02¼
Roofing Material, &c.:	
Asphaltum, Trinidad Refined, ℔ ton	$30.00@$35.00
Asphaltum, Rock, ℔ ton	$14.00
Coal Tar Felt, 1 Ply, ℔ ℔	2¢
Coal Tar Felt, 2 Ply, ℔ roll 108 sq. ft.	$1.42½
Coal Tar Felt, 3 Ply, ℔ roll 108 sq. ft.	$1.85
Roofing Pitch, ℔ bbl	$2.24

Pipe, Drain.....50%

Pipe and Fittings, Cast Iron Soil—

Cast-Iron Soil Pipe, Tarred, sizes 2 to 6 inches, inclusive	60@60&10%
Other sizes	55@55&10%
Cast-Iron Fittings, Tarred, sizes 2 to 6 inches	60@60&10%
Other sizes	55@55&10%

Pipe, Spiral—

Galvanized.....60%
Tin.....60%

Pipe, Wrought Iron—

For discounts see Current Hardware Prices.

Polish, Stove—

See Current Hardware Prices.

Rivets and Burrs—

For discounts see Current Hardware Prices.

Rock and Slag Wool—

	℔	℔ cub. foot.
Slag Wool, ordinary	1¼	19¢
Slag Wool, extra	4¼	38½¢
Rock Wool, ordinary	2¼	27¢
Rock Wool, extra	7¼	43½¢

Rosin—

Common and Good—Strained.
Rosin, C. & D. ℔ bbl. $1.07@$1.15
Rosin, E. & F. ℔ bbl. $1.25@$1.40
Rosin, G. & H. ℔ bbl. $1.50@$1.75
Rosin, I. & K. ℔ bbl. $2.00@$2.80
Rosin, M. & N. ℔ bbl. $3 40@$4.00

Seamless Brass Tubes..net

Shoes and Elbows—See *Elbows and Shoes.*

Slate Roofing—

According to size, f.o.b. cars, Quarry Station.

Pennsylvania:
Best Bangor, ℔ sqr. $3.25@$4.50
Pen Argyle, ℔ sqr. 3.50@ 4.25
Peach Bottom, ℔ sqr. 5.00@ 6.25
No. 1 Chapman, ℔ sqr. 4.00@ 4.65
Lehigh Slates, ℔ sqr. 3.00@ 4.50

Vermont:
Sea Green, ℔ sqr. 2.70@ 3.20
Purple, ℔ sqr. 3.50@ 4.50
Unfading Green, ℔ sqr. 3.50@ 4.00
Red, ℔ sqr. 9.75@12.00

Solder and Soldering Fluids—

Solder—

½ & ½ (Guaranteed) 13½@15¢
No. 1 11¾@12½¢
Prices of Solder indicated by private brands vary according to composition.

Soldering Fluids—

Concentrated Soldering Flux.
f.o.b. New York.
In barrels, ℔ ℔ 4¢
Smaller quantities, ℔ ℔ 5¢

Gedney's Soldering Fluid.
In carboys or barrels, ℔ ℔ 2¢
$1.50 for ca rboy or barrel; money refunded when returned.

Perfection Soldering Flux.
No charge for package.
Bbls., about 500 ℔, ℔ ℔ 3½¢
½ bbls., about 300 ℔, ℔ ℔ 4¢
Kegs, about 110 ℔, ℔ ℔ 4¢
75¢ extra for keg.
Kegs, about 55 ℔, ℔ ℔ 4¢
Yager's Soldering Salts.
¼-℔ bottles, each 30¢
Large quantities, per ℔ 40¢

Spelter—

Western Spelter 5¢@5¼¢
Bertha 8¢

Spiral Pipe—See *Pipe, Spiral.*

Stove-Pipe Elbows—See *Elbows, Stove Pipe.*

Stove Polish—See *Polish, Stove.*

Stove Trucks—See *Trucks, Stove.*

Strainers Conductor—

Galvanized 60%

Tin, Pigs and Bars—

Banca, pigs, ℔ ℔ 21½¢
Straits, pigs, ℔ ℔ 21¢
Straits in bars, ℔ ℔ 22¢

Tin Plates—

American Terne Plates—

Apollo Roofing.
IC, 14 x 20 $6.25
IC, 20 x 28 12.50
IX, 14 x 20 7.25
IX, 20 x 28 14.50

Buckeye.
IC, 14 x 20 $7.00
IC, 20 x 28 14.00
IX, 14 x 20 8.25
IX, 20 x 28 16.50
IXX, 14 x 20 9.50
IXX, 20 x 28 19.00

De Mût's.
First New York, IC, 14 x 20 $5.75
" " " IC, 20 x 28 11.50
First New Jersey, IC, 14 x 20 5.75
" " " IC, 20 x 28 11.50
Manhattan, IC, 14 x 20 7.25
" IC, 20 x 28 14.50

Dunlap's.
Double Dipped, IC, 14 x 20 $8.25
" " IC, 20 x 28 16.50
" " IX, 14 x 20 9.50
" " IX, 20 x 28 19.00
Domestic, IC, 20 x 28 12.00
" IX, 20 x 28 15.00

Glendale Tin Plate Co.
Optimus, Best Redipped, IC, 14 x 20 $8.25
" " " IC, 20 x 28 16.50
" " " IX, 14 x 20 9.75
" " " IX, 20 x 28 19.50
N. F., Old Style, IC, 14 x 20 7.50
" " " IC, 20 x 28 15.00
" " " IX, 14 x 20 9.00
" " " IX, 20 x 28 18.00
Bonus, Extra Coated, IC, 14 x 20 6.75
" " " IX, 14 x 20 8.25
" " " IC, 20 x 28 13.50
" " " IX, 20 x 28 16.50

Hamilton's.
Hamilton's Best Redip'd, IC, 14x20 $9.25
" " " IC, 20x28 18.50
" " " IX, 14x20 10.75
" " " IX, 20x28 21.50
Osceola Hand Coated, IC, 14x20 8.25
" " " IC, 20x28 16.50
" " " IX, 14x20 9.75
" " " IX, 20x28 19.50
Lula Best Charcoal, IC, 20x28 12.50
" " " IX, 20x28 16.00

Laufman's.
Apollo, IC (Resquared), 14 x 20 $8.12
Apollo, IX (Resquared), 14 x 20 9.37
Apollo, IC (Resquared), 20 x 28 16.00
Apollo, IX (Resquared), 20 x 28 18.50
Apollo, IC (Resquared), 20 x 56 16.00
Apollo, IX (Resquared), 20 x 56 18.50
Tip Top, IC (Resquared), 14 x 20 6.62
Tip Top, IX (Resquared), 14 x 20 7.88
Tip Top, IC (Resquared), 20 x 28 13.00
Tip Top, IX (Resquared), 20 x 28 15.50
Allegheny, IC, 14 x 20 6.12
Allegheny, IX, 14 x 20 6.38
Allegheny, IC, 20 x 28 12.00
Allegheny, IX, 20 x 28 12.50

Merchant's.—All Stamped
Crescent, IC, 20 x 28 $12.00
Crescent, IC, 14 x 20 6.00
Hickory, IC, 20 x 28 (Resquared) 12.75
Hickory, IC, 14 x 20 (Resquared) 6.37½
Empire, IC, 20 x 28 12.25
Empire, IC, 14 x 20 6.12½
Alaska, IC, 20 x 28 (Resquared) 14.00
Alaska, IC, 14 x 20 (Resquared) 7.00
Merchant's Roofing, IC, 20 x 28 (Resquared) 17.00
Merchant's Roofing, IC, 14 x 20 (Resquared) 8.50
Merchant's Old Method, IC, 20 x 28 Resquared) 19.00
Merchant's Old Method, IC, 14 x 20 (Resquared) 9.50

Pittsburgh Tin-Plate Works.
Kensington:
IC, 14 x 20 $6.75
IC, 20 x 28 13.50
IX, 14 x 20 8.00
IX, 20 x 28 16.00
Westmoreland:
IC, 14 x 20 $6.25
IC, 20 x 28 12.50
Juno:
IC, 14 x 20 $5.75
IC, 20 x 28 11.50

Scott's.—All Stamped.
Scott's Extra Coated, IC, 14 x 20 (Resquared) $9.25
Scott's Extra Coated, IX, 14 x 20 (Resquared) 10.75
Scott's Extra Coated, IC, 20 x 28 (Resquared) 18.50
Scott's Extra Coated, IX, 20 x 28 (Resquared) 21.50
Neville, IC, 14 x 20 6.00
" IX, 14 x 20 7.25
" IC, 20 x 28 12.00
" IX, 20 x 28 14.00

N. & G. Taylor Co.'s.
Taylor, Old Style, IC, 14 x 20 (Stamped and Resquared) $9.25
Taylor Old Style, IC, 20 x 28 (Stamped and Resquared) 18.50
Taylor Roofing, IC, 14 x 20 (Stamped and Resquared) 8.00
Taylor Roofing, IC, 20 x 28 (Stamped and Resquared) 16.00
Columbia, IC, 14 x 20 (Stamped) 7.00
Columbia, IC, 20 x 28 (Stamped) 14.00
Maple, IC, 14 x 20 (Stamped) 6.50
Maple, IC, 20 x 28 (Stamped) 13.00
Willow, IC, 14 x 20 6.25
Willow, IC, 20 x 28 12.50
Knoxall, IC, 14 x 20 6.00
" IC, 20 x 28 12.00
Globe, IC, 14 x 20 5.75
Globe, IC, 20 x 28 11.50

A. A. Thompson & Co.'s.
Old Colony, IC, 14 x 20 $8.00
" " IC, 20 x 28 16.00
Thompson's Puritan, IC, 14 x 20 5.75
" " IC, 20 x 28 11.50
Durham, IC, 14 x 20 5.75
" IC, 20 x 28 11.50
Central, IC, 14 x 20 5.45
" IC, 20 x 28 10.75
" WC, 14 x 20 5.25
" WC, 20 x 28 10.25
Tarn, IC, 20 x 28 10.50

U. S. Brands.—All Stamped.
U. S. Monongahela, IC, 14 x 20 $6.50
U. S. Redipped, IC, 14 x 20 9.25
20 x 28 double the price of 14 x 20

American Bright Plates—

Merchant's.
Merchant's Dipped, IC, 14x20 $11.00
Palma Xtra, IC, 14x20 7.25
Florence, IC, 14x20 6.75

N. & G. Taylor Co.'s.
Brilliant, Tissue Packed, IC, 14x20 $9.00
Royal, extra, IC, 14x20 7.00
Merion, IC, 14x20 6.75
Linden, IC, 14x20 6.50
Almond, IC, 14x20 6.25
Mint, IC, 14x20 6.00

U. S.
IC, 14x20 $7.25
IC, 20x28 14.50

Imported Terne Plates—

Charcoal.
Dean Grade.—IC, 14 x 20 @$5.65
20 x 28 @11.00
IX, 14 x 20 @ 6.40
20 x 28 @12.80
Abercarne Grade.—IC, 14 x 20 @ 5.55
20 x 28 @10.80
IX, 14 x 20 @ 6.40
20 x 28 @12.80

Imported Bright Plates—

Charcoal.
Duty: 2.2¢ ℔.
Melyn and Calland Grade. IC, 10 x 14 @$6.50
" " IC, 12 x 12 @ 6.75
" " IC, 14 x 20 @ 6.50
" " IC, 20 x 28 @13.00
" " IX, 10 x 14 @ 8.50
" " IX, 12 x 12 @ 8.75
" " IX, 14 x 20 @ 8.50
" " IX, 20 x 28 @17.00
" " DC, 12½ x 17 @ 6.00
" " DX, 12½ x 17 @ 8.00
Allaway Grade. IC, 10 x 14 @ 6.00
" " IC, 12 x 12 @ 6.25
" " IC, 14 x 20 @ 6.00
" " IC, 20 x 28 @12.00
" " IX, 10 x 14 @ 7.50
" " IX, 12 x 12 @ 7.75
" " IX, 14 x 20 @ 7.50
" " IX, 20 x 28 @15.00
" " DC, 12½ x 17 @ 5.50
" " DX, 12½ x 17 @ 7.00

Coke.
Steel Coke.—IC, 10x14, 14x20 $5.40@$5.50
10x20 @ 8.50
20x28 11.50@12.00
IX, 10x14, 14x20 @ 7.00
B. V. Grade.—IC, 10x14, 14x20 @ 5 50

Imported Boiler Plates.—

IXX, 14x26..(112 sheets) ..@$13.35
IXX, 14x28..(112 sheets) ..@ 14.50
IXX, 14x31..(112 sheets) ..@ 16 00

Tinning—

Brass and Copper net

Tubing—

Tin 55%
Galvanized 55%

Troughs, Eave—See *Eave Troughs.*

Trucks Stove—

Improved Lock Frame, per doz. $15.00
Steel Lock Frame, per doz. 18.00

Iron Wire—

See *Hardware Prices.*

Brass and Copper.—

Standard List 30@35%

Zinc—

600 ℔ casks 6½¢
Per ℔ 7¢

Crossing Rivers on Air Floats.

The transportation of troops across rivers by means of air floats made of the hides of animals has been the subject of extended experiments recently by the Russian military authorities. This system of transportation is described by a French military review, and highly recommended as offering advantages which would make it of much use in great military campaigns: "The large number of animals daily slaughtered for the food purposes of an army furnish ready means of obtaining the hides required in constructing the floating rafts, and at much less expenditure of time and labor than would be required in constantly transporting a pontoon train. The floats are made in the following manner: After the animal has been killed the hide is cut only where necessary and carefully removed. The neck portion is closed by a number of stitches, and the openings of the legs and tail are encircled by strong cords. A tube is inserted into one of the leg openings, by means of which the hide may be blown full of air. The tendons of the animal furnish the necessary cords for binding the various parts together. The hides, after being filled with air, are placed beneath the rafts, one at each corner. So buoyant are these air floats that by their aid a large number of soldiers or heavy pieces of artillery may safely be carried across rivers or other bodies of water."

Although this method of crossing rivers is pronounced a novelty in transportation by the review above quoted, the Russians are actually by no means the first people who have availed themselves of this expedient. It is, in fact, but another illustration of the truth of the Wise Man's dictum that "there is nothing new under the sun." The traveler in upper Egypt and Nubia today may see the natives of that portion of the "unchanging East" practicing this method of crossing the Nile, as their progenitors did 3000 or 4000 years ago. With the aid of bladders and skins they regularly transport themselves and their goods and chattels—the latter on their heads—from one side of the river to the other; and this practice is employed by the inhabitants of various other parts of the African continent. Moreover, the use of inflated skins for transporting an army over rivers was adopted by the troops of Xerxes long before the Christian era, and the expedient has been, in modern times, utilized on more than one occasion by the British troops in India. Instances might be multiplied of the antiquity of this supposed "novel" method of transportation, which is, indeed, as old as history.

Dr. Haffkine, a German physician, has inoculated numbers of European residents in India for cholera, including British officials and the officers and men of several regiments. His system has been received with great favor by the rulers of several native States, who are about to adopt it in their dominions.

The Cramps have received a check from the Government for the sum of $900,000, of which $700,000 was in payment for work on the "New York," and $200,000 for the bonus earned by that boat for exceeding the required speed.

Two steamers for service between Buffalo and Duluth are now being built by the Globe Iron Works of Cleveland. These ships will cost $600,000, have quadruple expansion engines, 25, 36, 51½ and 74 inches diameter, of 7000 horse-power; all valves of the piston type. The length is 380 feet, beam 44 feet, depth 34 feet. They will be provided with 28 boilers of the Belleville type.

An extraordinary series of frauds has been disclosed in connection with the building of two iron bridges across the Lachine Canal at Montreal, Canada. The stone was hauled by teams owned by members of the Provincial Legislature for 20 miles, from the quarry to the works, at the rate of only one load a day, although a railway ran into the mouth of the quarry. Thus the stone which should have cost $5 a cubic yard actually cost $59.

Probably few people realize the large amount of work which is regularly carried on at the Brooklyn Navy Yard. Thus in the construction department alone 740 men are at present employed in repairing the war ships.

The total receipts of the New York post office for the fiscal year ending June 30 were $7,369,260 52, an increase over the preceding year of nearly $600,000.

Current Hardware Prices.

JULY 21, 1893.

Note.—The quotations given below represent the Current Hardware Prices which prevail in the market at large. They are not given as manufacturers' prices, and manufacturers should not be held responsible for them. In cases where goods are quoted at lower figures than the manufacturers name, it is not stated that the manufacturers are selling at the prices quoted, but simply that the goods are being sold, perhaps by the manufacturers, perhaps by the jobbers at the figures named.

The character @ is used to indicate a range of price; thus discount 50&10@50&10&5 % signifies that the goods in question are sold at prices ranging from discount 50 and 10 % to discount 50 and 10 and 5 %.

Adjusters, Blind—

Domestic.....₩ doz $3.00, 33⅓%
Excelsior....₩ doz $10.00.....50&10&2%
North's.....list net @ 10%
Zimmerman's—See Fasteners Blind.

Ammunition—See *Caps, Cartridges, Shells, &c.*

Anvils—

Eagle Anvils, ₩ ℔ 9¢.....15@15&5%
Peter Wright's.....11@11½%
Armitage's Mouse Hole.....10½@11¢
Am. Wrought, Horse shoe brand..11@11½¢
Trenton.....10@10½¢
Wilkinson's.....10½@11¢
Moore & Barnes Mfg. Co.....33⅓%

Anvil Vise and Drill—

Millers Falls Co., $18.00.....20%
Cheney Anvil and Vise.....25%
Allen Anvil and Vise $3.00.....40&10%
Star.....45&5%

Apple Parers—See *Parers, Apple, &c.*

Augers and Bits—

Common Augers and Bits.....70@70&10%
Boring Machine Augers.....70@70&10%
Car Bits, 12-in. twist.....50%
Russell Jennings' Augers and Bits.25&10%
Jennings' Pattern Car Bits.....40%
Jennings' Pattern Auger Bits.....60%
Snell's Bits.....60&5%
C. E. Jennings & Co., No. 10, extension lip.....40%
C. E. Jennings & Co., No. 30.....60%
C. E Jennings & Co., Auger Bits, ₩ set, 32½ quarters, No. 5, $5; No. 30, $3.50.25%
Lewis' Patent Single twist.....45%
Pugh's Black.....20%
Pugh's Jennings Pattern.....30%
L'Hommedieu Car Bits.....15&10%
Forstner Pat. Auger Bits.....15%
Cincinnati Bell-Hangers' Bits.....30&10

Bit Stock Drills—

Morse Twist Drills.....50&10&5%
Standard.....50&10&5%
Cleveland.....60&10&5%
Syracuse, for metal.....50&10%
Syracuse, for wood (wood list).30@30&5%
Cincinnati, for wood.....30&10%
Cincinnati, for metal.....45&10%

Expansive Bits—

Clark's small, $18; large, $26..35@35&10%
Ives' No. 4, ₩ doz. $60.....40%
Swan's.....40%
Steer's, No. 1, $26; No. 2, $18.....35@40%
Stearns' No. 2, $48.....20%

Gimlet Bits—

Common.....₩ gross $2.75@$3.25
Diamond.....₩ doz $1.25....40&10%
Bee.....25@25&5%
Double Cut, Shepardson's.....45@45&10%
Double Cut, Ct. Valley Mfg. Co....30&10%
Double Cut, Bartwell's, ₩ gro., $5.00..25%
Double Cut, Douglass'.....40&10%
Double Cut, Ives.....60@60&10%

Hollow Augers—

Ives', French, Swift & Co. (Beecher), Douglass'.....33⅓@33⅓ &10%
Bonney's Adjustable, ₩ doz $48.....50%
Stearns'.....20&10%
Ives' Expansive, each $4.50.....50&5%
Universal Expansive, each $4.50.....20%
Wood's.....25@25&10%
Cincinnati Adjustable.....25&10%
Cincinnati Standard.....25&10%

Ship Augers and Bits—

L'Hommedieu's.....15&10@15&10&5%
Watrous'.....25@25&10%
Snell's.....25@25&10%
Snell's Ship Auger Patt'n Car Bits, 15&10@15&10&5%

Awl Hafts—See *Hafts, Awl.*

Awls—

Awls, Sewing, Common....₩ gr. 85¢@90¢
Awls, Should. Peg.....₩ gr. $1.50@$1.55
Awls, Pat. Peg.....₩ gr. 35¢@38¢
Awls, Shouldered Brad..₩ gr. $1.30@ 1.40
Awls, Handled Brad....₩ gr. $2.50@$3.00
Awls, Handled Scratch..₩ gr. $4.00@4.50
Awls, Socket Scratch..₩ doz. $1.10@$1.20

Awl and Tool Sets—See *Sets, Awl and Tool.*

Axes—

	Plain.	Beveled.
First quality, best brands.	$7.00	$7.50
First qual., other brands	6.50 / 6.75	7.00
Second quality	5.50	6.00

Axle Grease—See *Grease, Axle.*

Axles—

No. 1....3½¢@4½¢, No. 2, 5¢@6¢ / Nos. 7 to 14.....60&10% / Nos. 15 to 18.....47½% / Nos. 19 to 22.....70% — 8% cash
Concord Axles, loose collar.....4½¢@6¢
Concord Axles, solid collar.....5½¢@7¢
Nations Tubular Self Oiling.....
93½@93½&5%

Bag Holders—See *Holders, Bag.*

Balances—

Spring Balances.....40%

	No. 2000	20	30
Chatillon, ₩ doz.....	$0.80	0.95	1.75 net

Chatillon Straight Balances.....40%
Chatillon Circular Balances.....50&10%

Barb Wire.—See *Wire, Barb.*

Bars—

Crow—

Cast Steel.....₩ ℔ 3½¢
Iron, Steel Points.....₩ ℔ 3¢

Basins, Wash—

Standard Fiberware, No. 1, 10½-in., $1.80; 12-inch, $2.00; 13½-inch, $2.50; 15-inch, $3.00.

Beams, Scale—

Scale Beams, List Jan. 12, '82..50&10@50&10&5%
Chatillon's No. 1.....40%
Chatillon's No. 2.....50%
Custer's.....33⅓%

Beaters—

Egg—

Dover.....₩ doz $1.00@$1.20
Duplex (Standard Co.).....₩ doz $1.00
Dover (Standard Co.).....₩ doz $1.00
Duplex Extra Heavy (Standard Co.)....₩ doz. $3.50
Bryant's.....₩ gross $14.00
Double (H. & R. Mfg. Co.), ₩ gro., No. 0 $12.00; No. 1, $15.00; No. 2.....$36.00
Easy (H. & R. Mfg. Co.).....₩ gro $12.00
Triple (H. & R. Mfg. Co.).....₩ gro $16.50
Spiral.....₩ gro $4.25 @ $4.50
Improved Acme (H. & R. Mfg. Co.)....₩ gro. $9.00
Silver & Co.....₩ doz $5.50

Culinary—

Keystone, P. D. & Co., Each, No. 1, $1; No. 2, $2.....20%

Bells—

Cow—

Common Wrought.....60&10%
Western, Sargent's list.....70&10%
Kentucky, "Star".....20&10%
Kentucky, Sargent's list.....70&10%
Kentucky Durham.....70&10%
Dodge, Genuine Kentucky....70@70&10%
Texas Star.....50&10@50&10&5%

Door—

Gong, Abbe's.....33⅓&10%
Gong, Yankee.....45&10%
Gong, Barton's.....40&10@50%
Crank, Brooks'.....60&10&2%
Crank, Cone's.....10%
Crank, Connel's.....20&10%
Lever, Sargent's.....60&10%
Lever, Taylor's Bronzed or Plated....net
Lever, Taylor's Japanned.....25&10%
Lever, R. & E. Mfg. Co.'s..60&10&2%
Pull, Brook's.....50&10&2%

Electric—

Wollensak's.....20%
Bigelow & Dowse.....20%

Hand—

Light Brass.....70&10@70&10&5%
Extra Heavy.....70%
White.....70%
Silver Chime.....33⅓&10%
Globe Cone's Patent).....25&10@35%

Miscellaneous

Call.....45@50%
Farm Bells.....₩ ℔ 3¢@3½¢
Steel Alloy Church and School Bells..40%

Bellows—

Blacksmiths'.....60&10&5@60&10&10%
Molders'.....40&10@50%
Hand Bellows.....40&10@50%

Belting, Rubber—

Common Standard.....75@75&10%
Standard.....70&5@70&10%
Extra.....60&10@60&10&10%
N.Y.B.&P. Co., Carbon.....60@60&5%
N.Y.B.&P.Co., Diamond.....50@50&5%
N.Y.B.&P.Co., Para.....40@40&5%

Bench Stops—See *Stops, Bench*

Benders and Upsetters, Tire—

Stoddard's Lightning Tire Upsetters..15%
Detroit Perfected Tire Bender.....15%
Green River Tire Benders and Upsetters.....20%

Bits—

Auger, Gimlet, Bit Stock Drills, &c., see *Augers and Bits.*

Bit Holders—See *Holders.*

Blind Adjusters—See *Adjusters, Blind.*

Blind Fasteners—See *Fasteners, Blind.*

Blind Staples—See *Staples, Blind.*

Blocks—

Cleveland Block Co., Mal. Iron.50@50&10%
Moore's Novelty, Mal. Iron.....50%
Sure Grip Steel Tackle Blocks.....25%
See also *Machines, Hoisting.*

Bolts—

Carriage, Machine, &c.—

Com. list June 10, '84.....75&10&5@80%
Genuine Eagle, Norway, list Oct. '84.....80&5@80&10%
Eagle, Norway, list Oct. '8480&10@80&15
Phila. pattern, list Oct. 7, '84.....80%
R.B.&W., old list.....70%
Machine, list Jan. 1, 1890.....80&10%
Bolt Ends, list Jan. 1, 1890.....80&10%

Door and Shutter—

Cast Iron Barrel, Square, &c.....70&10%
Cast Iron Shutter Bolts.....70&10%
Cast Iron Chain (Sargent's list)....65&10%
Ives' Patent Door Bolts..60&10@60&10&5%
Wrought Barrel.....70&10@75%
Wrought Square.....70&10@75%
Wr't Shutter, all Iron, Stanley's....60&10@60&10&10%
Wr't Shutter, Brass Knob.....50@50&5%
Wr't Shutter, Sargent's list.....60&10%
Wr't Sunk Flush, Sargent's list....60&10%
Wr't Sunk Flush, Stanley's list.50&10&5%
Wr't B. K.Flush, Common.....55&10%

Stove and Plow—

Stove.....60&10@60&10&5%
Plow.....60&10&50@60&10&10%
R. B. & W., Plow.....55%

Tire—

Common, list Feb. 28, '83.....65@65&5%
Port Chester Bolt and Nut Company:
Empire list Feb. 28, '83.....65%
Keystone, Philadel., list Oct. '84.....80%
Norway, Phila., list Oct. '84.....75%
American Screw Company'
Norway, Phila., list Oct. 16, '84.....75%
Eagle, Phila., list Oct. 16, '84.....80%
Philadel., list Oct. 16, '84.....80%
Bay State, list Feb. 28, '83.....65%
R. B. & W., Philadel., list Oct. 16, '84..80%

Borers, Tap—

Common and Ring.....20&10%
Ives' Tap Borers.....33⅓&5%
Enterprise Mfg. Co.....20%
Clark's.....33⅓&35%

Borax—

Per ℔.....9½@10½¢

Boring Machines—See *Machines, Boring.*

Bow Pins—See *Pins, Bow.*

Boxes, Wagon—

Per ℔.....2¾¢

Boxes, Miter.

Spiiker's Excelsior, 3 in. $7.50, 4 in $8 50, 5 in. $13.00, 6 in. $15.00.....20%

Braces—

American Bit Brace and Tool Co..
Nos. 10, 12, 20.....60&10%
Nos. 11, 21, 24, 27.....70&10%
Nos. 22, 23, 25.....60&10&5%
Nos. 13, 26, 36, 37.....70&10&5
Amidon's,
Barker's Imp'd Plain.....75&10@80%
Barker's Imp. Nickeled.....65&10@70%
Ratchet.....75&10@80%
Eclipse Ratchet.....60%
Globe Jawed.....40@40&10%
Corner Brace.....40@40&10%
Universal, 8 in., $2.10; 10 in.....$2.25
Buffalo Ball.....$1.10@$1.15
Barber s.....50&10%
Saxton's,
Barker's Imp. Polished.....75&10@80%
Barker's Imp. Nickeled.....65&10@70%
Ratchet, Polished.....50&10@60%
Ratchet, Nickeled.....40&10@50%
Buffalo Ball.....net, $1.10@$1.15
Bartholomew s,
Nos. 25, 27 and 30.....50&10@60&5%
Nos. 117, 118, 119.....70@70&5%
Common Ball, American.....$1.00@$1.10
Fray's Genuine Spofford's...50&5@50&10%
Fray's Nos. 70 to 120, 81 to 123. 207 to 414 50&10%
Ives' New Haven Novelty.....70@70&5%
New Haven Ratchet.....60&5@60&10%
Barber Ratchet.....60&5@60&10%
Barber's.....60&5
Spofford.....60&5@60&10%
P. S. & W. Co., Peck's Patent.....60%
Rose & Johnson.....50%
Davis Patent.....50&10%

Brackets—

Shelf, plain,
Regular, list.....65@70%
Sargent's list.....60&10@70&10%
Shelf, fancy,
Sargent's list.....70@70&10%
Other makes at a wide range of prices.
Bradley Shelf Brackets.....70&10%

Bright Wire Goods—See *Wire.*

Broilers—

Henis' Self-Basting.	Inch.....	9	10	9x11
	Per doz..	$4.50	5.50	6.50

New Haven.....50%
Wire Goods Co.....65&10%
Morgan Odorless.....₩ doz. $12, 50%
Queen City.....33⅓%

Buckets, Well—Galvanized—

Hill's.....₩ doz. 12 qt. $4.25; 14 qt. $5.25
Iron Clad.....₩ doz. 14 qt. $4.25@4.50
Helwig's Flat Iron Band.....$3.75
Helwig's Wired Top.....₩ doz $4.00

Bull Rings—See *Rings, Bull.*

Butcher's Cleavers—See *Cleavers Butchers*

Brass—

Wrought Brass.....80@80&10%
Cast Brass, Tiebout's.....65%
Cast Brass, Fast.....33⅓&10%
Cast Brass, Loose Joint.....33⅓&10%

Cast Iron—

Fast Joint, Narrow.....50&10&5@60%
Fast Joint, Broad.....50&10@60%
Loose Joint.....
Loose Joint, Japanned.....
Loose Joint, Jap. with Acorns..
Parliament Butts.....
Mayer's Hinges.....
Loose Pin, Acorns.....
Loose Pin, Acorns, Japanned...
Loose Pin, Acorns, Japanned, Plated Tips.....
75@75 &10%

Wrought Steel—

Fast Joint, Narrow.....
Fast Joint, Lt. Narrow.....
Fast Joint, Broad.....
Loose Joint, Broad.....
Table Butts, Back Flaps, &c.....
Inside Blind, Regular.....
Indide Blind, Light.....
Loose Pin.....
List Jan. 2 1893. 40@40&10%
Bronzed Wrought Butts.....50@50&10%

Calipers—See *Compasses.*

Calks, Toe—

Gautier, One Prong, Blunt.....5½@8¢
Burke's One Prong, Blunt.....5½@8¢
Burke's, Two Prong, Blunt.....7½@8¢
Burke's, One Prong, Sharp.....6½@7¢

Can Openers—See *Openers, Can.*

Cans, Milk—

S S. & Co.: 5-gal., $3.00; 8-gal., $4 40; 10-gal., $4.75 each.....40&10%

Caps—

Percussion—

Hicks & Goldmark's and Union Metallic Cartridge Co.....₩ 100%
F. L. Waterproof, 1-10's.....35@37¢
E. B. Trimmed Edge, 1-10's.....47@50¢
E. B. Grnd. Edge, Cent. Fire, 1-10's.....47@50¢
Musket, Waterproof, 1-10's.....50@58¢
G. D.....27@30¢
S. B. Genuine Imported.....45¢
Eley's E. B.....56@58¢
Eley's D Waterproof, Central Fire..$1.60

Primers—

Berdan Primers, $1.00.....25%
B. L. Caps (Sturtevant Shells) $1.00....25%
All other Primers, $1.20.....25%

Cards—

Watson's Cotton, Wool, Horse and File, list January 28, 1891.....25%

Carpet Stretchers—See *Stretchers, Carpet.*

Cartridges—

Rim Fire Cartridges.....50&5&2%
Rim Fire Military.....15&5%
Cent. Fire, Pistol and Rifle.....25&5&2%
Cent. Fire, Military and Sporting 15&5&2%
Blank Cartridges, except 22 and 32 cal., additional 10% to above discounts.
Blank Cartridges, 22 cal., $1.75.....2%
Blank Cartridges, 32 cal., $3.50.....2%
Primed Shells and Bullets.....15&5&2%
B. B. Caps, Round Ball, $1.75.....2%
B. B. Caps, Con. Ball, Swgd., $2.00.....2%

Carpet Sweepers—See *Sweepers, Carpet.*

Casters—

Bed	Brass.....	55@55&10%
Plate	Others....	60@60&10%
Shallow Socket...		
Deep Socket		40&10%
Martin's Patent (Phœnix)		45&10@50&10%
Tucker's Patent, low list		45%
Payson's Anti-friction		70@70&10%
Payson's Truck		60@60&10%
Yale Casters, low list		45%
Yale, Gem		70%
Giant Truck Casters		85%
Stationary Truck Casters		50&10%
Socket Truck Casters		50@50&10%
Gwinner's Common Sense		45%
Gwinner's Hercules		45%

Cattle Leaders—See *Leaders, Cattle.*

Cement—

Victor Elastic.....5 ℔ pails ₩ ℔ 5¢

Chain—

Trace, Wagon and Fancy Chains, List revised May, 1893.....60@60&10%
American Coil, in cask lots,

3-16	¼	5-16	⅜	7-16	½	⅝	¾
$7.60	5.30	4.45	3.80	3.65	3.50	3.40	3.30

Less than cask lots, add½¢@½¢ ₩ ℔
German Coil, list July 12, 1892 60@60&10%
German Halter Chain, list July 12, 1892. 60@60&10%
Covert Halter.....60&3%
Cover Traces.....35&3%
Cover Heel Chain.....50&3%
Galvanized Pump Chain.
5 ton lots.....₩ 100 ℔ $5.50
1-ton lots.....₩ 100 ℔ $5.75
500-℔ lots.....₩ 100 ℔ $6.75
Less than 500 ℔.....₩ 100 ℔ $7.00
Oneida Halter Chain.....60@60&5%
Jack Chain, Iron and Brass, list July 10, 1893.....60%
Barnes' Reinforced Sash.....60&10%
Barnes' Victor Sash.....55%

Chalk—

White, case lots. ₩ gr 50¢, small lots.55¢
Red, case lots....₩ gr 67¢, small lots.72¢
Blue, case lots....₩ gr 75¢; small lots 90¢
See also Crayons

Chalk Lines—See *Lines.*

Checks, Door—
Unity....50%

Chisels—

Socket Framing and Firmer
P. S. & W.
New Haven
Witherby
Mix
Ohio Tool Co. } 75&10@75&10&10%
Douglass....75@75&5%
Buck Bros....30%
Merrill....60&10@60&10&5%
L. & I. J. White....30@30&5%

Tanged and Miscellaneous.
Tanged Firmers....50@50&10%
Butchers'....$4.75@$5.00
Spear & Jackson's....$5 to £
Buck Bros....30%
Cold Chisels, ₩ ℔....15@16¢

Chucks—
Beach Pat....each, $8.00....20%
Morse's Adjustable, each, $7.00,20@20&5%
Danbury....each, $6.00,30@30&5%
Syrace, Balz Pat....25%
Graham Patent....33⅓%
Skinner's Patent Chucks.
Combination Lathe Chucks....33⅓%
Universal Lathe Chucks....40%
Independent Lathe Chucks....40%
Drill Chucks....15%
Union Mfg. Co.
Victor....$8.50, 25%
Combination....40%
Universal....40%
Independent....40%

Churns—
Tiffin Union, each, 5 gal. $3.25; 7 gal., $3.75; 10 gal., $4.25.
McDermaid Star Barrel Churn, each 6 gal., $2.60; 10 gal., $2.75; 15 gal., $3.00; 20 gal., $3.25.

Clamps—
R. I. Tool Co.'s Wrought Iron....25%
Adjustable, Cincinnati....15&10%
Adjustable, Hammers....15@15&5%
Adjustable, Stearn's....30@30&10%
Stearn's Adjustable Cabinet and Corner....30@30&10%
Cabinet, Sargent's....70&10%
Carriage Makers', Sargent's.. 75@75&5%
Carriage Makers', P., S. & W Co...40&10%
Eberhard Mfg. Co....40&5@40&10%
Warner's....40&10@40&10&5%
Saw Clamps, see Vises, Saw Filers'.
Carpenter's, Cincinnati....25&10%
Barnes' Machinists' Clamps....33⅓%

Cleavers, Butchers'—
Bradley's....25@30%
L. & I. J. White....20&5%
Beatty's....40@40&5%
New Haven Edge Tool Co.'s....40%
P., S. & W....33⅓&5@33⅓&10%
Foster Bros....30%
Schulte, Lohoff & Co....40@40&5%

Clips—
Norway, Axle, ¼ & 5-16....55&5&5%
2d grade Norway Axle, ¼ & 5-16....65&5%
Superior Axle Clips....66⅔&5@70%
Norway Spring Bar Clips, 5-16...60&5&5%
Wrought Iron Felloe Clips....₩ ℔, 5½¢
Steel Felloe Clips....₩ ℔, 5¢
Baker Axle Clips....25%

Cloth and Netting, Wire
—See *Wire, &c.*

Cockeyes....50%

Cocks Brass—
Hardware list....60&2%

Coffee Mills—See *Mills, Coffee.*

Collars, Dog—
Chapman Mfg. Company, new list....40%
Medford Fancy Goods Co....40&10@50%
Embossed, Gilt, Pope & Steven's list, 30&10%
Leather, Pope & Steven's list....40%
Brass, Pope & Steven's list....40%

Combs, Curry—
Fitch's....50&10@50&10&10%
Rubber, per doz., $10.00....25%
American Curry Comb Co. ....33⅓@40%
Kohler's Magic Oscillating...₩ doz., $2.00
Kohler's Humane....₩ doz., $1.75

Compasses, Dividers, &c.
Compasses, Calipers, Dividers.70@70&10%
Bemis & Call Co.'s
Dividers....65%
Compasses....50&5%
Calipers, Inside or Outside....65%
Calipers, Wing....60%
Calipers, Double....65%
Calipers, Call's Patent Inside....55%
Excelsior....50%
J. Stevens & Co.'s....25&10%
Starrett's
Spring Calipers and Dividers....25&10%
Lock Calipers and Dividers....25%
Combination Dividers....25%

Coolers, Water—
S. S. & Co.: 2-gal., $2.00; 3-gal., $2.50; 4-gal., $2.75; 6-gal., $3.40 each....33⅓%

Coopers' Tools—
See *Tools, Coopers'.*

Cord—

Sash—
Common....₩ ℔, 8½@9¢
Patent, good quality....₩ ℔, 10@11¢
White Cotton Braided, fair...₩ ℔, 23@24¢
Common Russia Sash....₩ ℔, 12½@13¢
Patent Russia Sash....₩ ℔, 13½@ 14¢
Cable Laid Italian Sash....₩ ℔, 19@20¢
India Cable Laid Sash....₩ ℔, 11½@12¢
Silver Lake—
A quality, White, 50¢....25%
A quality, Drab, 55¢....25%
B quality, White, 30¢....10%
B quality, Drab, 35¢....10%
Sylvan Spring, Extra Braided, White.34¢
Sylvan Spring, Extra Braided, Drab..39¢
Semper Idem, Braided, White....27@28¢
Egyptian, India Hemp, Braided....26¢
Massachusetts, White....29¢
Samson—
Braided, White Cotton....₩ ℔, 37¢
Braided, Drab Cotton....₩ ℔, 42¢
Braided, Italian Hemp....₩ ℔, 40¢
Braided, Linen....₩ ℔, 56¢
Tate's Solid Braided—
Hercules, White....₩ ℔, 25¢
Hercules, Drab....₩ ℔, 30¢
Economy Drab....₩ ℔, 27¢
Economy White....₩ ℔ 22¢
Ossawan Mills—
Braided Giant, Whit ₩ ℔, 30¢....20%
Braided Giant, Drab and Fancy, ₩ ℔ 35¢....10%
Braided, Crown White, ₩ ℔, 50¢...50%
Braided, Crown Drab and Fancy, ₩ ℔ 5¢....30%

Wire Picture—
Braided or Twisted....80&5@80&15%

Corkscrews—See *Screws, Cork.*

Corn Knives and Cutters
—See *Knives, Corn.*

Crackers Nut—
Table (H. & B. Mfg. Co)....40%
Blake's Pattern, ₩ doz., $2.00....10%
Turner & Seymour Mfg. Co....50%
Acme.
Japanned, ₩ gro., $30....50%
Nickel Plated, ₩ gro. $30....10%

Cradles—
Grain....50&2@50&5&2%

Crayons—
White Crayons, ₩ gross....7@8¢
D. M. Stewart Mfg. Co.:
Metal Workers', ₩ gross, $1.75....25%
Rolling Mill, ₩ gross, 2.50....25%
Railroad, ₩ gross, 2.00....25%
Soapstone Pencils, ₩ gross,1.00....25%
See also *Chalk.*

Creamery Pails—See *Pails, Creamery.*

Crow Bars—See *Bars, Crow.*

Curry Combs—
See *Combs, Curry.*

Curtain Pins—
See *Pins, Curtain.*

Cutters—

Meat—
Dixon's, ₩ doz....40@10&5%

Nos.	1	2	3	4
	$14.00	$17.00	$19.00	$30.00

Woodruff's, ₩ doz....40@40&5%

Nos.	100	150
	$15.00	$18.00

Hale's, ₩ doz....70%

Nos.	11	12	13
	$27.00	$33.00	$45.00

American....30%

Nos.	1	2	3	4	B	5
Each	$5	$7	$10	$25	$50	$60

Enterprise....25%

Nos.	10	12	22	32	42
Each	$3	$2.50	$4	$6	$15

Little Giant, ₩ doz....40&10@50%

Nos.	305	310	312	320	322
	$35.00	$48.00	$44.00	$72.00	$68.00

Triumph No. 505, ₩ doz., $21.00...25@30%
Miles' Challenge, ₩ doz....45@45&10%

Nos.	1	2	3
	$22.00	$30.00	$40.00

Home No. 1, ₩ doz., $26.00....55&10%
Draw Cut, each:

Nos.	5	2	6	8
	$50	$75	$80	$225

....20@25%
Beef Shavers (Enterprise)....20%
Chadborn's Smoked Beef Cutter, ₩ doz., $66.00

Slaw and Kraut—
Tucker & Dorsey Mfg. Co.:
Slaw Cutters, 1 Knife, ₩ gross...$21.00
Slaw Cutters, 2 Knife, ₩ gross... 30.00
Kraut Cutters....40%

Tobacco—
Champion....20&10@30%
All Iron....₩ doz., $4.25
Nashua Lock Co.'s..₩ doz., $18.00, 50@55%
Wilson's....55%
Sargent's....₩ doz., $24.00, 55&10
Acme....₩ doz., $20.00, 40%

Washer
Smith's Pat....₩ doz., $12.00, 20&10&10%
Johnson's....₩ doz., $11.00, 33⅓%
Penny's..₩ doz.,, Pol. $14 ; Jap'd, $16, 55%
Appleton's....₩ doz., $16.00, 60&10%
Bonney's....30&10%
Cincinnati....25&10%

Diggers, Post Hole, &c.—
Samson, ₩ doz., $34.00....25@25&10%
Fletcher Post Hole Augers, ₩ doz., $36.00, 20@20&10%
Eureka Diggers....₩ doz. $12.00@$13.00
Vaughan's Post Hole Auger, ₩ doz., $8.50@$9.50
Kohler's Little Giant....₩ doz., $18.00
Kohler's Hercules....₩ doz., $14.00
Kohler's Invincible....₩ doz., $12.00
Kohler's New Champion....₩ doz., $8.00
Scheidler....₩ doz., $18.00
Cronk's Post Bars, ₩ doz., $60.00, 50&5&50&10%
Gibb's Post Hole Digger....₩ doz.,$15.00
Gibbs' National....₩ doz., $12.00
Gibbs' Columbia....₩ doz., $13.00
Gibbs' Imperial....₩ doz., $7.50
Shimer's Hollow Handle..₩ doz., $24.00, 50%
Gem, Improved ₩ doz.,.$9.00@$.0.00 net

Dividers—See *Compasses.*

Dog Collars—See *Collars, Dog.*

Door Checks—
See *Checks, Door.*

Door Springs—
See *Springs, Door.*

Drawers.
Money, ₩ doz....$18@$20
Waddell's Improved, ₩ doz....$15.00

Drawing Knives—
See *Knives, Drawing.*

Drills and Drill Stocks—
Blacksmiths'....each $1.75
Blacksmiths' Self-Feeding, each $7.50, 20%
Breast, P. S. & W....40&10%
Breast, Wilson's....30&5%
Breast, Millers Falls....each $3.00, 25%
Breast, Bartholomew's....each $2.50 25&10@40%
Ratchet, Merrill's....20@20&5%
Ratchet, Ingersoll's....25%
Ratchet, Parker's....20@20&5%
Ratchet, Whitney's....20&10%
Ratchet, Weston's....20@25%
Ratchet, Moore's Triple Action....25@30%
Ratchet, Curtis & Curtis....30%
Whitneys Hand Drill, Plain, $11.00; Adjustable, $12.00....20&10%
Automatic Boring Tools....$1.75@$1.85
Chicopee Automatic Drill....20&10%
Goodell Automatic Drills....40&5%

Twist Drills—
Cleveland....50&10&10%
Diamond, W. & B....50&10&10%
Graham's Pat. Groove Shank..50&10&10%
Morse....50&10&10%
New Process....50&10&10%
Standard....50&10&10%
Syracuse (Metal list)....50&10%

Drill Bits or Bit Stock

Drills—See *Augers and Bits.*

Drill Chucks—See *Chucks.*

Dripping Pans—
See *Pans, Dripping.*

Drivers, Screw—
Douglass Mfg. Co....20@20&10%
Disston's....50%
Buck Bros....30%
Stanley R. & L. Co.'s
No. 64, Varnished Handles....65&10%
No. 86....70&10%
Sargent & Co.'s
No. 1, Forged Blade....60&10&10%
Nos. 20, 40 and 60....66⅔&10&10%
P. S. & W....70%
Knapp & Cowles
No. 1....60&20@70%
No. 2....60&10&10@70&5%
No. 3....60&5@60&10%
Nos. 4 and 00, Acme and Ideal...50&5@50&10&5%
Stearns'....25&10&5%
Gay & Parsons....35%
Champion....25&10%
Clark's Pat....30@33⅓%
Ellrich's Socket and Ratchet..25@25&10%
Allard's Spiral, new list....25%
Kolb's Common Sense..₩ doz., $6.00, 25&10%
Syracuse Screw-Driver Bits....30&30&5%
Screw Driver Bits....₩ doz., 50@75¢
Screw Driver Bitts, Parr's..₩ gross, $6.25
Fray's Hol. H dle Sets...No. 3, $12.00, 45%
Cincinnati....25&10%
Brace Screw Drivers....25&10%
Buck Bros.' Screw Driver Bits....27½&5%
Goodell's Automatic....50%
Mayhew's Black Handle....50%
Mayhew's Monarch....45&10%
C. T. Williamson Wire Novelty Co....50%

Egg Beaters—See *Beaters, Egg*

Egg Poachers—
See *Poachers, Egg.*

Electric Bell Sets—
See *Bells, Electric.*

Emery—No. 4 to No. 54 to Flour, CF. FF.

	46 gr.	150 gr.	F.FF.
Kegs, ₩ ℔....	4½¢	5 ¢	2½¢
½ kegs, ₩ ℔...	4¾¢	5¼¢	2¾¢
¼ kegs, ₩ ℔...	5 ¢	5½¢	3 ¢
10-₩ cans, 10 in case....	6 ¢	6½¢	5 ¢
10-℔ cans, less than 10....	10 ¢	10 ¢	7½¢

Enameled and Tinned Ware—See *Ware, Hollow*

Escutcheon Pins—
See *Pins, Escutcheon.*

Escutcheons—
Door Lock....Same dis. as Door Locks.
Brass Thread....60@60&10%
Wood....25%

Expanded Metal—
List No. 5.
Lathing....10%
Fencing, Painted Sheets....20%
Netting, Painted Sheets....20%
Door Mats, Galvanized....25%
Window Guards, Paneled....15%
Tree Guards, Paneled....15%

Extractors, Lemon Juice
—See *Squeezers, Lemon.*

Fasteners, Blind—
Mackrell's, ₩ doz., $1.00....20@20&10%
Van Sand's Screw Pat, $15 ₩ gr.. 60&10%
Van Sand's Old Pat., $15 ₩ gr....55&10%
Austin & Eddy No. 2008....₩ gr., $9.00
Security Gravity....₩ gr., $9.00
Zimmerman's....50&10%

Faucets—
Fenn's....40%
Fenn's Cork Stops....33⅓%
Star....60%
Frary's Pat. Petroleum....60%
B. & L. B. Co.
West's Lock, Open and Shut Key...50%
Star, Metal Plug, new list....40%
Lockport, Metal Plug, reduced list..60%
Metallic Key, Leather Lined....60&10@60&10&10%
Cork Lined....70&5@70&10%
Burnside's Red Cedar....50%
Burnside's Red Cedar, bbl. lots....50&10%
John Sommers'
Peerless Best Block Tin Key....40%
IXL, 1st quality, Cork Lined....50%
Diamond Lock....40%
Perfection,Fla.Red Cedar(in boxes)40%
Boss Metallic Key....50%
Reliable Cork Lined....60%
O. K. Western Pattern Cork Lined..50%
No Brand, Red Cedar (in bbls.)..50&10%
Western Pattern Metal Key....40%
No Brand Metal Key....60%
Self Measuring
Enterprise, ₩ doz., $36.00....20%
Lane's ₩ doz., $36.00....25&10%

Felloe Plates—
See *Plates, Felloe.*

Fibre Ware—See *Ware, Fibre.*

Fifth Wheels—
Derby and Cincinnati....45&5%
Brewster....50&5%

Files—

Domestic—
Nicholson Files, Rasps, &c.60&10&5@60&10&10%
Nicholson (X.F.) Files....25%
Nicholson's Royal Files (Seconds)....75% (extra prices on certain sizes.)
American....66⅔&10@66⅔&10&5%
G. & H. Barnett (Black Diamond) 60&10@60&10&5%
Arcade....60&10&10@70%
Eagle....60&10&10@70%
Other makers, best brands..60&10&5@70%
Fair brands....70&10@70&10&10%
Second quality....80@80&5%
Heller's Horse Rasps....50&7½@50&10%
McCaffrey's Horse Rasps....50&10%
Chelsea Horse Rasps, Hand Cut...50&10%
Arcade Horse Rasps....60&10@60&10&5%
Trojan Horse Rasps....60&10&5%

Imported—
Butcher....Butcher's ll t, 20%
Stubs....Stub's' list 25@30%

Fixtures Grindstone—
Sargent's Patent....70&10%
Reading Hardware Co....30&10%
P., S. & W. Co....50&10%
Moore's....55%

Fluting Machines—
See *Machines, Fluting.*

Fluting Scissors—
See *Scissors, Fluting.*

Fodder Squeezers—
See *Squeezers, Fodder.*

Forks—
Hay, Manure, &c.Asso. List, 70@70&5&2%
Hay,Manure,&c.,Phila.List,60@60&10&2%
Plated, see Spoons.

Frames—

Saw—
White Vermont....₩ gro., $9.00@$10.00
Red, Polished and Varnished....₩ doz., $1.50, 25%

Screen, Window and Door—
Porter's Pat. Window and Door Frame, 33⅓&10%
Warner's Screen Corner Irons....33⅓@ 33⅓&10%
Stearns' Frames and Corners.25@25&10%
Cortland....40@40&5
Phillips' Window Screen Frames....50@50&5%
Bonanza Window Screens..50&5@50&10%
Empire Fancy Screen Doors, ₩ doz ..$12

Freezers Ice Cream—
White Mountain....60@60&5%
Granite State....65@65&5%
Arctic....70@70&5%
American....60%
Buffalo Champion....65@65&5%
Shepard's Lightning....65@65&5%
Gem....65%
Blizzard....70%
Double Action Crown....60%
Crown....60%
Star....60%
Peerless....60&10%
Giant....60%
Zero....70%
Boss and Pet....60&10&10&10%
Keystone, P., D. & Co., each, $1.50....20%
Standard....60@60&5%
Standard Double Action....60@60&5%
Expert....65@65&5%
Model....60@60&5%
Confectioners' Machine....50%

Fruit and Jelly Presses—
See *Presses, Fruit and Jelly*

Fruit Pickers—
See *Pickers, Fruit.*

Fry Pans—See *Pans, Fry.*

Funnels—
Gersdorff's Perfection, Standard and Globe; *Tin*, 1 gro., 10%; 2 to 5 gro., 20%; 5 to 10 gro....30%
Copper, 1 to 6 doz., 15%; 6 to 12 doz., 20%; over 12 doz....25%

Furnaces, Soldering—
Burgess No. 3 Gem tin reservoir....$7.00
Burgess No. 3 Gem, Copper reservoir.$8.50
Clayton & Lambert No. 1 Fire-Pot, complete....$6.00

Fuse—Dis. 12½@15%. ₩ 1000 ft.
Common Hemp Fuse,for dryground.$2.70
Common Cotton Fuse,for dry ground 2.85
Single Taped Fuse, for wet ground.. 3.85
Double Taped Fuse, for very wet gr.. 4.80
Triple Taped Fuse, for very wet gr.. 5.60
Small Gutta Percha Fuse, for water. 7.50
Large Gutta Percha Fuse, for water.12.00

Gates Molasses—
Stebbin's Pattern....80@80&5%
Stebbin's Genuine....60&10&10%
Stebbin's Tinned Ends....40&10%
Lincoln's Pattern....70@70&10%
Weed's....20&10%
Boss, ₩ doz.:
No. 1, $7; No. 2, $8; No. 3, $9; No. 4, $10....60&10&10%

Gauges—
Marking, Mortise, &c....60&10%
Starrett's Surface, Center and Scratch. 25&10%
Stanley R. & L. Co.'s Butt and Rabbet Gauge....20&10%
Barrett's Comb. Roller Gauge....₩ doz $8.00@$8.50
Hoague & Peck's Champion Gauge—
With Scale....₩ doz., $5.00
Without Scale....₩ doz., $4.00
Wire, Wheeler, Madden & Co....10%
Wire, Morse's....25%
Wire, Brown & Sharpe's....10@20%
Wire, P., S. & W. Co....10&10%

Gimlets—
Nail and Spike....50&10&5%
Eureka Gimlets....60&10%
Diamond Gimlets....₩ gr $5.00
Double Cut, Shepardson's....45@45&5%
Doub e Cut, Ives'....60@60&5%
Double Cut, Douglass'....40&10%

Glue—
Le Page's Liquid....25@25&5%
Upton's Liquid....35%
Improved Process....25@25&5%
Dodd's Liquid Glue....25@25&5%

Glue Pots—See *Pots, Glue.*

Grease, Axle—
Fraser's....Keg ₩ ℔ 4¢, Pail ₩ ℔ 6¢
Fraser's, in boxes....₩ gr $9.00
Dixon's Everlasting, in bxs..₩ doz 1 ℔ $1.20; 2 ℔ $2.00
Dixon's Everlasting....10-℔ pails, ea. 8¢
Lower grades, special brands, ₩ gr $5.50@$7.00
Axleine, tin boxes....₩ gross $13.00
English Coach, wooden boxes ₩ gross $8.50
English Coach, 5-℔ tin pails..₩ doz.$3.50
Tiger, wooden boxes....₩ gross $7.00
Tiger, 5-℔ tin pails....₩ doz $2.80

Grindstones—
Family, regular list....60%
Family, Cleveland Stone Co....20%

Grindstone Fixtures—
See *Fixtures, Grindstone.*

Gun Powder—See *Powder*

Hack Saws—See *Saws.*

Hafts, Awl—
Sewing, Brass Fer. ₩ gr....$1.75
Pat. Sewing, Short, ₩ doz....45@50%
Pat. Sewing, Long....₩ doz $1.80
Pat. Peg, Plain Top.₩ doz....40@40%
Pat Peg, Leather Top ₩ doz $1.50

Halters—

Covert's, Rope, Jute.....60&10&10&2%
Covert's Rope, 7-16-in., Jute.....70&2%
Covert's Rope, ½-in., Hemp.....50&2%
Covert's Adj. Rope Halters.....40&2%
Covert's Hemp Horse and Cattle Tie, 50&10&2%
Covert's Jute Horse Ties.....70&2%
Covert's Jute Cattle Ties.....70&10&2%
Covert's Adj. Web Halters.....35&5&2%
Covert's Saddlery Works Halters...33⅓&5%
Covert's Saddlery Works Horse and Cattle Ties.....33⅓&5%
Covert's Saddlery Works Handy Web Halters.....33⅓&5%

Hammers—

Handled Hammers—

Maydole's, list Dec. 1, '85.....25&10@35%
Buffalo Hammer Co.....
Humason & Beckley.....
Atha Tool Co.....
Verree.....
} ....50&10%
C. Hammond & Son.....40&10@—%
Fayette R. Plumb.....
Artisans' Choice, A. E. Nail.....40&10%
Regular Y. & P., A. E. Nail.....50%
Horseshoe Turning Hammers.....50%
Other Hammers.....50&10%
Cheney's Claw.....40&10%
Cheney's Machinist's & Riveting...50&5%
Magnetic Tack, Nos. 1, 2, 3, $1.25, 1.50 & 1.75.....30&10%
Nelson Tool Works.....40&10%
Warner & Nobles, new list.....25&10
Peck, Stow & Wilcox.....35@40%
Sargent's.....40@40&10%

Heavy Hammers and Sledges—

8 ℔ and under...℔ ℔40¢
8 to 5 ℔.....℔ ℔36¢ } 75&10@75&10 &5%
Over 5 ℔.....℔ ℔30¢
Wilkinson's Smiths.....10½¢@11¢℔ ℔

Handcuffs and Leg Irons

—See *Police Goods.*

Handles—

Cross-Cut Saw Handles—

Atkins', new list.....40%
Champion.....15%
Ely's Perfection.....℔ doz., $3.00
Sensible.....40%

Iron, Wrought or Cast—

Door or Thumb.

Nos.	0	1	2	3	4
Per doz.	$0.90	1.00	1.08	1.35	1.50

60&10&10%
Roggin's Latches.....℔ doz 30@35¢
Bronze Iron Drop Latches..℔ doz 70¢ net
Jap'd Store Door Handles—Nuts, $1.62; Plate, $1.10; no plate, $0.88.....net
Barn Door, ℔ doz $1.40.....10&10%
Chest and Lifting.....70@70&10%

Wood—

Saw and Plane.....40&10@50%
Hammer, Hatchet, Axe, &c.....40@40&5%
Brad Awl.....℔ gr $2.00
Hickory Firmer Chisel, ass'd..℔ gr 4.50
Hickory Firmer Chisel, large..℔ gr 5.00
Apple Firmer Chisel, ass'd...℔ gr 5.00
Apple Firmer Chisel, large...℔ gr 6.00
Socket Firmer Chisel, ass'd..℔ gr 3.00
Socket Framing Chisel, ass'd.℔ gr 5.00
} 40&10@50%
J. B. Smith & Co.'s Pat File.....50%
File, assorted.....℔ gr 2.75
Auger, assorted.....℔ gr 5.00 } 50%
Auger, large.....℔ gr 7.00
Pat. Auger, Ives'.....30&10%
Pat. Auger, Douglass.....℔ set $1.25
Pat. Auger, Swan's.....℔ set $1.00
Hoe, Rake, Shovel, &c.....60@60&5%

Hangers—

Barn Door, old patterns.....70@70&5%
Barn Door, New England.....70@70&5%
Samson Steel Anti-Friction.....55%
Orleans Steel.....55%
Hamilton Wrought Steel Track.....55%
Champion.....60&10%
Climax Anti-Friction.....55%
Zenith for Wood Track.....55%
Sterling.....50&10@60%
Victor, No. 1, $15.00; No. 2, $16.50; No. 3, $18.00.....50&2%
Kidder's.....50@50&10%
Boss.....60&10@60&10&5%
Best Anti-Friction.....60&10@60&10&5%
Duplex (Wood Track).....60&10&5%
Terry's Modern.....50&10@50&10&5%
Terry's Ideal.....50&10@50&10&5%
Terry's Solid.....50&10@60%
Terry's Shield.....50&10@60%
Terry's Wrought Single Strap.....50&10%
Cronk's Patent, Steel Covered.....50&10%
Carrier Steel Anti-Friction.....50&10%
Richards'.....30@30&10%
Lane's New Standard.....50@50&5%
Lane's Standard.....50&5@50&10%
Lane's Parlor.....40%
Warner's Pat.....20&10&10%
Stearns' Anti-Friction.....20&10&10%
Stearns' Challenge.....25&10&10%
Cincinnati Nos. 1, $2.25; 3, $2.50; 4, $2.50.
Paragon, Nos. 5, 6¼, 7 and 8.....20&10%
Crescent.....60@60&10%
Nickel, Steel, Nos. 0, $25; 1, $20; 2, $15, 40&10@50%
Chicago Anti-Friction.....30&10%
Star.....40&10@40&10&5%
Barry.....50%
Interstate.....50&10@60%
Pendulum, Payson's.....40@40&10%
Moody.....45%
Economy, $6.00.....50&10%
Perfection.....50&10@50&10&5%
Lundy, Steel Parlor.....40%
Matchless.....50&10%
Magic.....45&10%
Wild West.....45@10%
Moore's Elevator.....33⅓%
Moore's Baggage Car Door.....33⅓%
Moore's Railroad.....55%

Harness Snaps—See *Snaps.*

Hatchets—

American Axe and Tool Co.
Blood's.....
Hunt's.....
Hurd's.....
Mann's.....
Peck's.....
Underhill's.....
} 40 & 10
Buffalo Hammer Co.....
Fayette R. Plumb.....
C. Hammond & Son.....
Kelly's.....
Sargent's & Co.....
P., S. & W. Co.....
} @ 50&5%
Ten Eyck Edge Tool Co.....
Collins.....10%
Schulte, Lohoff & Co.....50@50&5%

Hay and Straw Knives—

See *Knives.*

Hinges—

Blind Hinges—

Parker.....75&2%
Huffer.....50%
Clark's, Nos. 1, 3, 5, 40 and 50..80@80&5%
Clark's Mortise Gravity.....50%
Sargent's, Nos. 1, 3, 5, 11, 12, 13..75@75&10%
Reading's Gravity.....75&10@75&10&5%
Shepard's.
Noiseless.....75&10%
Niagara.....80%
Buffalo.....80%
Clark's Genuine Pattern.....80%
O. S., Lull & Porter.....75&10%
Acme, Lull & Porter.....75%
Queen City Reversible...70&10&5@75%
Clark's, Lull & Porter, Nos. 0, 1, 1½, 2, 2½, 3.....75&10&2½%
North's Automatic Blind Fixtures, No. 2, for Wood, $9.00; No. 3, for Brick, $11.50.....10%

Gate Hinges—

Western.....℔ doz $4.20, 60@60&10%
N. E.....℔ doz $7.80, 60@60&10%
N. E. Reversible ℔ doz..$5.60, 6 @60&10%
Clark's, Nos. 1 2, 3.....60&10&5%
N. Y. State.....℔ doz $4.90,60@60&10%
Automatic.....℔ doz $12.50, 50%
Shepard's.....60&10&5%

Spring Hinges—

Geer's Spring and Blank Butts...40%
Union Spring Hinge Co.'s list, March, 1886.....20%
Barker's Double Acting.....25%
Union Mfg. Co.....25%
Bommer's.....30%
Buckman's.....15@20%
Chicago.....30%
Bardsley's Patent Checking.....15%
Acme.....30%
U. S.....25&10%
Empire and Crown.....20%
Hero and Monarch.....55%
American, Gem and Star.....20%
Oxford.....20%
Royal.....66⅔%
Reliable.....60%
Champion.....60%
No. 10 Matchless.....60%
No. 25 Unbreakable.....60%
J. G. C. Covered, ℔ gro., $30.....50&5%
Samson.....60@60&7½%
Wiles', No. 1, ℔ gro., $16; No. 2.....$13
Devore, No. 1.....℔ gro , $13.00
Rex.....℔ gro., $13.00
Freeport.....℔ gro., $12.00
New Idea Nos. 1 and 10.....℔ gross $13.00
New Idea Dbl. Acting.....45%
Ideal No. 3.....℔ gross $10.00
Stearns' Noiseless Floor Hinge, ℔ set, $5.00.....20&10@30%

Extra 5@10% often given.

Wrought Iron Hinges—

List February 14, 1891.
Strap and T.....50&10@50&10&5%
Corrugated Strap and T.....50&10&5%
Screw Hook and Strap.....
6 to 12 in., ℔ ℔.. 4¢
14 to 20 in., ℔ ℔..3½¢
22 to 36 in., ℔ ℔.. 3¢
Screw Hook and Eye.....
¾ in., ℔ ℔ 7⅛¢
¾ in., ℔ ℔ 5⅜¢
½ in., ℔ ℔ 4¾¢
Rolled Blind Hinges, Nos. 32 and 34 50&10%
Rolled Blind Hinges, Nos. 232 and 234 55&10%
Rolled Plate.....70&10%
Rolled Raised.....70&10¢
Plate Hinges "Providence" { 8, 10 & 12 in., ℔ ℔.....5¢ over 12 in. ℔ ℔.....4¢

Hoes—

Eye—

D. & H. Scovil.....20%
Lane's Crescent, Planters' Pattern.45&5%
Lane's Razor Blade, Scovil Pattern...30%
Maynard, S. & O. Pat.....45&5%
Sandusky Tool Co., S. & O. Pat } 60&5
Am. Axe and Tool Co., S. & O. Pat... } @60&10%
Chattanooga Tool Co., S. & O. Pat..60& 5@60&10%
Grub.....60&10%

Handled—

Garden, Mortar, &c.....70@70&5&2%
Planter's, Cotton, &c.....70@70&5&2%
Warren Hoe.....60@60&5%
Magic.....℔ doz $4.00

Hog Rings and Ringers—

See *Rings and Ringers—*

Hoisting Apparatus—

See *Machines, Hoisting.*

Hollow-Ware—

See *Ware, Hollow.*

Holders—

Bag—

Sprengle's Pat.....℔ doz $18.....60%

Bit—

Extension.
Barber's, ℔ doz $15.00.....40@40&10%
Ives, ℔ doz $20.00.....60&5@60&10%
Diagonal.....℔ doz $24.00, 40%
Angular.....℔ doz $24.00, 40&5%

File and Tool—

Balz Pat.....℔ doz $4.00, 25%
Nicholson File Holders.....20%

Sash—

Motley's Adj. Sash, Medium Size..... ℔ doz $1.20, 40%

Hooks—

Cast Iron—

Bird Cage, Sargent's List.... } 60&10&10%
Bird Cage, Reading..... }
Clothes Line, Sargent's list.
Clothes Line Moore's.....70%
Clothes Line, Reading list. 60&10@60&10&10%
Ceiling, Sargent's list.....55&10&10%
Harness, Reading list..55&10@55&10&10%
Coat and Hat, Sargent's list. 55&10@60&10%
Coat and Hat, Reading. 50&10@50&10&10%
Coat and Hat, Moore's.....70%

Wrought Iron—

Cotton.....℔ doz $1.25
Cotton Pat. (N. Y. Mallet and Handle W'ks.....30%
Tassel and Picture, T. & S. Mfg.Co....50%
Wrought Staples Hooks, &c. See Wrought Goods

Wire—

Wire Coat and Hat, Gem, list April, 1886.....60@60&10
Wire Coat and Hat, Miles, list April, 1886.....50@50&10%
Indestructible Coat and Hat...45@45&5%
Wire Coat and Hat, Standard.60@60&10%
Handy Hat and Coat.....50&10@60%
Steady Ceiling Hooks.....50&10@60%
Belt.....80&15@80&20%
Atlas, Coat and Hat.....65%
Williamson's Bird Cage Hooks, List April, 1892.....40%
Bright Wire Goods—See Wire.

Miscellaneous—

Grass, No. 2, $2.00; No. 3, $2.10; No. 4, $2.25
Nolin's Grass.....℔ doz $2.25
Bush.....55@60%
Whiffletree—Patent.....55%
Hooks and Eyes—Malleable Iron. 70@70&10%
Hooks and Eyes—Brass.....60&10&10%
Fish Hooks, American.....50%
Bench Hooks—See Bench Stops.

Horse Nails—See *Nails, Horse*

Horse Shoes—

See *Shoes, Horse.*

Hose, Rubber—

Competition, Fair quality.....75@75&10%
Competition, Low Grade.....80@80&10
Standard.....70&10&70@10&5%
Extra.....60&10@60&10&10%
N. Y. B. & P. Co., Para.....25&5%
N. Y. B. & P. Co., Extra.....40&5@50%
N. Y. B. & P. Co., Dundee.....60@60&5%
Cotton Garden, ¾ in., coupled:
Fair Quality, ℔ ℔.....7¢
Good Quality, ℔ ℔.....8½¢

Huskers—

Blair's Adjustable.....℔ gr $8.00
Blair's Adjustable Clipper.....℔ gr 7.00
Hubbard's Solid Steel.....℔ gr 4.50

Indurated Fiber Ware—

See *Ware, Indurated Fiber.*

Irons.

Sad—

From 4 to 10, at factory....℔ 100 ℔, $2.30@$2.40
Self-Heating.....℔ doz $8.00
Self-Heating Tailors'.....℔ doz $18.00
Mrs. Potts' Sad Irons, per set:

No.	50	55	60	65
Small lots	.90	.85	1.05	.95

Crown.....60&10@60&10&5%
Ideal Irons, new list...50&10@50&10&10%
Salamander Irons.....25%
B. B. Sad Irons, ℔ ℔.....3@3¼¢
Chinese Laundry (N.E.Butt Co.).8½¢, 15%
New England.....5¢, 20@20&5%
Mahony's Troy Pol. Irons.....25%
Sensible, list Jan. 91.....50&10&5%
Sensible Tailor's Irons.....33⅓&5%
National Self-Heating.....30%

Soldering—

Soldering Coppers.....℔ ℔ 19@21¢
Covert's Adjustable, list Jan. 1, 1886, 35&2%
Tinker's Dread..℔ doz $1.75; ℔ gro. $18

Pinking—

Pinking Irons, ℔ doz., 55@60¢.

Jack Screws—See *Screws.*

Jacks, Wagon—

Daisy.....33⅓%
Victor.....33⅓%
Lockport.....40%

Kettles—

Brass, Spun, Plain, list Jan. 1, '91..25&5%
Brass, Spun, Pld.W.M.list Jan. 1, '91..20%
Stamped Brass Kettles.....℔ ℔ 21¢
Enameled and Tea—See *Ware, Hollow.*

Keys—

Lock, Ass'n list Dec. 30, 1886..65&10@70%
Eagle, Cabinet, &c.....33⅓&2%
Hotchkiss' Brass Blanks.....40%
Hotchkiss' Copper and Tinned.....40%
Hotchkiss' Pad. and Cab.....35%
Wollensak Tinned.....50&10%

Knife Sharpeners—

See *Sharpeners, Knife.*

Knives—

Butcher, Shoe, &c.

Wilson's Butcher Knives, List Dec 8, 1890.....25%
Ames' Butcher Knives.....25%
Foster Bros.' Butcher, &c.....40%
Jordan's Aa A1 Butchers', list.....net
Nichols' Butcher Knives.....40&10%
W. W. Wilson, Butcher, 6 in., $2.00; 7 in., $2.70; 8 in., $3.80, &c.
Ames' Shoe Knives.....20@25%
Ames' Bread Knives, ℔ doz $1.50, 15@20%
Moran's Shoe and Bread.....20@20&10%
Hay and Straw—See Hay Knives.
Table and Pocket—See Cutlery.

Corn—

Bradley's.....10%
Wadsworth's.....25@25&10%

Drawing—

Witherby..... }
P., S. & W..... }
Mix..... } ...75@75&10&5%
New Haven..... }
Merrill..... ....60&10@60&10&5%
Douglass.....75&75@5%
Watrous.....15&10@25
L & I. J. White.....20&5%
Bradley's.....35%
Adjustable Handle.....25@33⅓%
Wilkinson's Folding.....25@25&5%

Hay and Straw—

Lightning, from Jobbers....$3.00@$9.00
Wadsworth's.....40&7½@40&10%
Carter's Needle...℔ doz. $11.00@$11.50
Heath's.....℔ doz. $13.00@$13.50
Nolin's Hay..℔ doz. $7.00@$8.00

Mincing—

Am. (2d quality), ℔ gr., 1 blade, $7
2 blades, $12; 3 blades, $18.....net
Lothrop's.....20&10%
Smith's, ℔ doz., Single, $2; Double $3 45&50%
Knapp & Cowles.....50&10&60%
Buffalo Adjustable....℔ doz. $3.00, 33⅓%

Knobs—

Door, Mineral.....60@65%
Door, Por. Jap'd.....70@75%
Door, Por. Nickel.....$2.00@$2.25
Door, Por. Plated Nicke..l....$2.00@$2.25
Drawer, Porcelain.....60&10@60&10&10%
Hemacite Door Knobs.....40&10@50%
Yale & Towne Wood, list Dec., 1885...40%
Base, Rubber Tip.....70&10&5%
Picture, Judd's.....60&10&10@70%
Picture, Sargent's.....70&10%
Picture, Hemacite.....85&5%
Shutter, Porcelain.....65&10%
Carriage, Jap.....℔ gro 80¢, 60&10%
Bardsley's Wood Door, Shutter, &c...15%

Ladders.

Davies Extension and Single.....20&5%

Ladles—

Melting, Sargents'.....60@60&5%
Melting, Reading.....35&10%
Melting, P., S. & W.....35&10@40%
Melting, Warner's.....30%

Lanterns—

Tubular—

Regular, with Guard.....℔ doz $3.50
O. K., with Guard.....℔ doz $3.75
Side Lift, with Guard.....℔ doz $4.00
Square Lift, with Guard.....℔ doz $4.25
Anti-Friction, with Guard....℔ doz $4.50
Brass Plated, Sq. Lift, Guard.℔ doz $5.00
Cop. Plated, Sq. Lift, Guard..℔ doz $5.50

Bull's Eye Police—

2¾-inch regular.....℔ doz $3.00
3-inch regular.....℔ doz $3.00
2¾-inch flash light.....℔ doz $4.00
3-inch flash light.....℔ doz $4.50

Lawn Mowers—

See *Mowers, Lawn.*

Leaders, Cattle—

Humason, Beckley & Co.'s.....70%
Sargent's.....70&10@70&10&10%
Hotchkiss.....30%
Peck, Stow & W. Co.....60&10%

Lemon Squeezers—

See *Squeezers, Lemon.*

Lifters, Transom—

Wollensak's:
Class 3 and 4, Bronzed Iron.....60%
Class 3 and 4, Bronze Metal.....50%
Class 3 and 4, Brass.....50%
Skylight Lifters.....35%
Reiher's, list Feb. 20, 1891
Bronzed Iron Rods.....60@60&10%
Brass, Real Bronze or Nickel Plate..30%
Excelsior.....50&10&2%
Shaw's.....50&10%
Payson's:
Universal.....60%
Solid Grip.....60&10@60&10&10%
Imperial.....50&10%

Lines—

Cotton and Linen Fish.....50%
Chalk.....60%
Masons' Linen, 84 ft., No. 1, $1.25; No. 2, $1.75; No. 3, $2.25; No. 4, $2.75; No. 5, $3.25.....25%
Cotton Chalk.....55%
Samson Cotton, No. 4, $2; No. 4¼, $2.50; 1 ℔.....
Silver Lake, Braided No. 0, $6.00; No. 1, $6.50; No. 2, $7.00; No. 3, $7.50 ℔ gro.....25%
Mason's Linen, No. 3½, $1.50; No. 4, $2.00; No 4½, $2.50.
Mason's Colored Cotton.....45%
Wire Clothes..Nos. 18 19 20
100 ft.....$3.50 $3.00 $2.50
Ventilator Cord, Samson Braided, White or Drab Cotton..℔ doz $7.50..30%
Ossawan Mills, Chalk, Twisted, 60%; Chalk, Soft Braided, 50% Chalk, Braided, 25%.

Links, Open—

Terry's—per gro.:

Nos.	1	2	3	4
	$6.00	8.00	12.00	16.00

Locks, &c.—

Cabinet—

Eagle, Gaylord Parker and Corbin... } List March, '84, rev. Jan. 1, '85.33⅓&5%
Deitz, Nos. 36 to 39.....40%
Deitz, Nos. 51 to 63.....40&10%
Deitz, Nos. 87 to 96.....80%
Champion Night Latches.....40%
Barnes Mfg. Co.....40@40&10%
Eagle and Corbin Trunk.....25&10
Champion Cab. and Combin.....33⅓%
Yale.....net prices
Romer's.....20

Door, Locks, Latches, &c.—

R. & E. Mfg. Co., list Mar.20, 1889..... } 65&10@70% Much lower net prices often made
Mallory, Wheeler & Co., list July, '88..... }
Sargent & Co., List Aug. 1, '88 }
Branford Lock Works }

Brittan, Graham & Mathes, list Jan. 1890.....60&10&10%
Plate.....33⅓&2%
Barnes Mfg. Co.....40@40&10%
Yale.....net prices
Deits Flat Key.....30%
Romer's Night Latches.....15%
Brooklyn Latches.....50&10%
Warner's Burglar Proof, ₩ doz. $8.00, 50%

Elevator—

Moore's.....33⅓%

Padlocks—

List June 10, 1891.....50&2%
Norwich Lock Mfg. Co., old list....50&2%
Yale Lock Mfg. Co.'s.....net prices
Eagle.....40%
Eureka, Eagle Lock Co.....40&2%
Romer's Nos. 0 to 91.....30%
Romer's Scandinavian, &c., Nos. 100 to 506.....15%
A. E. Deits.....40%
Champion Padlocks.....40%
Hotchkiss.....30%
Star.....60%
Horseshoe.....₩ doz $9. 50@50&10%
Barnes Mfg. Co.....40@40&10%
Nock's.....30%
Scandinavian.....90&40%
E. T. Fraim's Keystone Scandinavian, Nos. 119, 120, 130 and 140.....90&10%
Other Nos.....65%
Ames Sword Co. up to No. 150.....40%
Ames Sword Co. above No. 150.....50%
Slaymaker, Barry & Co.
No. 1010 line.....90&5%
No. 41 line.....60%
No. 61 line.....60%
No. 21 line.....80%

Sash, &c.—

Clark's No. 1, $10; No. 2, $8 ₩ gr.....33⅓%
Ferguson's.....33⅓%
Victor.....60&10&2%
Walker's.....10%
Attwell Mfg. Co.....25&33⅓%
Reading.....66⅔&10@66⅔&10&10%
Hammond's Window Springs.....40%
Common Sense, Jap'd, Cop'd and Br'zed.....₩ gr $4.00
Common Sense, Nickel Plated. ₩ gr $10.00
Universal.....30%
Kempshall's Gravity.....60%
Kempshall's Model.....60@60&10%
Corbin's Daisy, list Feb. 15, 1886.....70%
Payson's Perfect.....60&10&10%
Hugunin's Sash Balances.....25&5&2%
Hugunin's New Sash Locks.....25&5&2%
Ives Patent.....60&10&5@60&10&10%
Fish (Liesche's pat.), No. 100, ₩ gr., $8; No. 105, ₩ gr., $10.....50%
Davis, Bronze, Barnes Mfg. Co.....60%
Champion Safety list January, 1893.70&5%
Security.....70%
Giant, list Jan., 1892.....70&5%
Wolcott's.....60&10&5%
Monarch.....50%

Lumber Tools—

See *Tools, Lumber.*

Lustre—

Four-ounce bottles.....₩ doz, $1.75; ₩ gross.....$17.00

Machines.

Boring—

	Without Augers.	Upright.	Angular.
Douglas		$5.50	$6.75
Snell's, Rice's Pat.	5.50	6.75	40&10&10%
Jennings'	5.50	6.75	45@45&10%
Other Machines	2.85	2.75	
Phillips' Patent with Augur	7.00	7.50	
Miller's Falls	7.50		25%
Boss, Carpenters'	3.60		
Boss, Ship Bldrs'.	3.85		

Fluting—

Knox, 4½-inch Rolls.....$3.25 each } 35%
Knox, 6-inch Rolls.....$3.60 each }
Eagle, 3½-inch Rolls, $2.15.....35%
Eagle, 5½-inch Rolls, $2.85.....35%
Crown, 4½ in., $3.50; 6 in., $4.00; 8 in., $6.50 each.....35%
Crown Jewel, 6 in.....$3.50 each, 35%
American, 5 in., $3.00; 6 in., $3.40; 7 in., $4.50 each.....35%
Domestic Fluter.....each, $1.50
Geneva Hand Fluter, White Metal, ₩ doz $12, 25%
Crown Hand Fluter, Nos. 1, $15.00; 2, $12.50; 3, $10.00; 4, $8.25.....30%
Shepard Hand Fluter, No. 85, per doz $15.50.....40%
Shepard Hand Fluter, No. 110, ₩ doz $11.00.....40%
Shepard Hand Fluter No. 95, ₩ doz $8.00.....40%
Combined Fluter and Sad Iron. ₩ doz $15.00.....30%

Hoisting—

Moore's Hand Hoist, with Lock Brake.20%
Moore's Anti-Friction Differential Pulley Block.....20%
Moore's Rope Differential Pulley Block.....60%
Energy Mfg. Co.'s.....25%
See also *Blocks.*

Washing—

Anthony Wayne, ₩ doz, No. 1, $42; No. 2, $36; No. 3, $42.
Wayne American.....₩ doz $36.00
Western Star ₩ doz, No. 2, $36; No. 3 $30.
Weisell.....₩ doz $54.00
Fair and Square.....₩ doz $42.00

Mallets—

Hickory.....20&10@20&10&10%
Lignumvitæ.....20&10@20&10&10%
B. & L. Block Co., Hickory & L. V. 30@30&10
Mattocks—Regular list. 60&10@60&10&5%

Measures—

Standard Fiberware, No. 1, peck ₩ dozen, $3.50; ½ peck, $3.00

Meat Cutters—

See *Cutters, Meat.*

Menders, Harness—

Per doz.....$2.00

Milk Cans—See *Cans, Milk.*

Mills—

Coffee—

Box and Side, List Jan. 1, 1888..60@60&5%
Net prices are often made which are lower than above discount.
American, Enterprise Mfg. Co., list Jan. 17, 1893.....20%
The Swift, Lane Bros.....30%
Waddell's New Box Mills, Ideal Brand, New List.....60%

Mincing Knives—

See *Knives, Mincing.*

Molasses Gates—

See *Gates, Molasses.*

Money Drawers—

See *Drawers, Money.*

Mowers, Lawn—

Best Machines: 10-in., $4; 12-in., $4.50; 14-in., $5; 16 in., $5.50; 18-in., $6
Low-Grade Machines: 10-in. $3; 12-in., $3.25 14-in., $3.50 each

Muzzles—

Safety.....₩ doz, $3.00, 25%

Nails.—

Cut and Wire. See Trade Report.
Wire Nails, Papered.
Association list, May 1, '92.80&10&10&5%
Tack Mfrs.' list.....70&5&70&10%
Hungarian, Finishing, Upholsterers', &c. See *Tacks.*

Horse—

	Nos. 6	7	8	9	10	
American	9½	9½	9½	9½	9½	net
Ausable	28¢	26¢	25¢	24¢	23¢	40&5&2%
Clinton, Fin.	19¢	17¢	16¢	15¢	14¢	.30&5%
Essex	28¢	26¢	25¢	24¢	23¢	40&10@50%
Lyra	9½	9½	9½	9½	9½	net
Snowden	9½	9½	9½	9½	9½	net
Vulcan	23¢	21¢	20¢	19¢	18¢	.25%
Northwest'n.	25¢	23¢	22¢	21¢	20¢	25@25&5%
A. C.	25¢	23¢	22¢	21¢	21¢	25&10@33⅓&5%
C. B. K.	25¢	23¢	22¢	21¢	21¢	33⅓@33⅓&10%
Maud S.	25¢	23¢	22¢	21¢	21¢	40&10&5%
Champlain	28¢	26¢	25¢	24¢	23¢	40&5&2%
Champion	25¢	23¢	22¢	21¢	20¢	10&10&10%
Capewell.	19¢	18¢	17¢	16¢	16¢	.10&5%
Anchor	23¢	21¢	20¢	19¢	18¢	.35%
Western	23¢	21¢	20¢	19¢	18¢	.50%
Empire Bronzed						13@14 ₩ lb

Picture—

Brass Head, Sargent's list.....60@60&10%
Brass Head, Combination list.....60&10%
Porcelain Head, Sargent's list.50&10&10%
Porcelain Head, Combination list.40&10%
Niles' Patent.....40%

Nail Pullers—See *Pullers, Nail.*

Nail Sets—See *Sets, Nail.*

Nut Crackers—

See *Crackers, Nut.*

Nuts—List Dec. 18, 1889.

	Square.	Hex.
Hot Pressed	5.80¢	6.50¢ off list
Cold Punched	5.00¢	5.10¢ off list

In packages of 100 lb, add 1-10¢ ₩ lb, net; in packages less than 100 lb, add ½¢ ₩ lb, net.

Oakum—

Best or Government.....₩ lb 6¾@7¼¢
U. S. Navy.....₩ lb 5¾@6¢
Navy.....₩ lb 5¢@5¼¢

Oil Tanks—See *Tanks, Oil.*

Oilers—

Zinc and Tin.....65&10@70&5%
Brass and Copper.....50&10@50&10&5%
Malleable, Hammers' Improved, No. 1, $3.60; No. 2, $4.00; No. 3, $4.40 ₩ doz. 10@10&5%
Malleable, Hammers' Old Pattern, same list.....45%
Prior's Pat. or "Paragon" Zinc. 60&10&10%
Prior's Pat. or "Paragon" Brass.....50%
Olmstead's Tin and Zinc.....60%
Olmstead's Brass and Copper.....50%
Broughton's Zinc.....60%
Broughton's Brass.....50%
Steel, Draper & Williams.....50%

Openers, Can—

Messenger's Comet.....₩ doz $3.00, 25%
American.....₩ gross $2.75@$3.00
Duplex.....₩ doz 25¢, 15@20%
Lyman's.....₩ doz $3.75, 20%
No. 4, French.....₩ doz $2.25, 55@60%
No. 5, Iron Handle.....₩ gr $6.00, 45@50%
Eureka.....₩ doz $2.50, 10%
Sardine Scissors.....₩ doz $2.75@3.00
Star.....₩ doz $2.75
Sprague, No. 1, $2.00; 2, $2.25; 3, $2.50; 66⅔@70%
Excelsior, No. 1 $2.50; No. 2, $1.50.....40%
World's Best ₩ gross, No. 1, $12.00; No. 2, $24.00; No. 3, $36.00.....50&10%
Universal, ₩ doz $3.00.....55&5%
Domestic, ₩ doz $2.00.....45%
Champion, ₩ doz $2.00.....50%
Moore's.....70%

Packing, Steam—

Rubber—

Standard.....70@70&10%
Extra.....60@60&5%
N. Y. B. & P. Co., Standard.....50%
N. Y. B. & P. Co., Empire.....60%
N. Y. B. & P. Co., Salamander.....25%
Jenkins' Standard, ₩ lb 80¢.....25@25&5%

Miscellaneous—

American Packing.....10@11¢ ₩ lb
Russia Packing.....14¢ ₩ lb
Italian Packing.....13¢@.4¢ ₩ lb
Cotton Packing.....15¢@17¢ ₩ lb
Jute.....7¢@8¢ ₩ lb

Pails—

Creamery—

S. S. & Co.: 18-qt., $7.00; 20-qt., $7.25 per doz.....5%

Galvanized—

	Quarts	10	12	14
Hill's Light Weight,	₩ doz.	$2.75	3.00	3.25
Hill's Heavy Weight,	₩ dz.	3.00	3.25	3.75
Heiwig's		2.50	2.75	3.00
Sidney Shepard & Co.		2.50	2.75	3.00
Iron Clad		2.50	2.75	3.00
Fire Buckets		2.75	3.25	3.50

Buckets—See Well Buckets.

Indurated Fiber Ware—25%

Star Pails, 12 qt.....₩ doz $4.20
Milk, 14 qt.....₩ doz $5.40
Stable, 14 qt.....₩ doz $8.00
Fire Pails, deep.....₩ doz $4.80
Fire Pails, round bottom.....₩ doz $5.40

Standard Fiber Ware—

	Plain.	Decr'd
Water Pails, 12 qt., ₩ doz.	$3.15	$3.75
Dairy Pails, 14 qt., ₩ doz.	3.75	4.25
Fire Pails, No. 1, 12 qt., ₩ doz	3.75	
Fire Pails, No. 2, 14 qt., ₩ doz	4.25	
Sugar Pails	5.50	6.00
Horse Pails	4.50	
Buggy Pails	3.50	
Slop Jars (bal. trap)	7.50	8.50
Chamber Pails, 14 qt.	6.00	7.00

Pans—

Dripping—

Small sizes.....₩ lb 5½¢
Large sizes.....₩ lb 5¢
Silver & Co. (Covered).....40%

Fry—

Standard List:

No.	0	1	2	3	4
₩ doz.	$3.00	$3.75	$4.25	4.75	$5.25
No.	5	6	7	8	
₩ doz.	$6.00	$7.00	$8.00	$9.00	

Polished, regular goods.....75@75&10%
Acme Fry Pans.....66⅔%

Dust—

Steel Edge, No. 1.....₩ doz $1.75

Roasting and Baking—

Columbian, S. S. & Co.: Nos. 10, $2: 20, $2.25; 30, $2.50 each.....60&10%

Paper and Cloth—Sand and Emery—

List April 19, 1886.....50&10@50&10&10%
Sibley's Emery and Crocus Cloth.....30%

Parers—

Apple—

Advance.....₩ doz $4.75
Baldwin.....₩ doz 5.25
Bonanza.....each 5.00
Daisy.....₩ doz 4.00
Dandy.....each 7.50
Eclipse.....₩ doz 4.25
Eureka, 1888.....each 16.00
Family Bay State.....₩ doz 12.00
Favorite.....₩ doz 5.00
Gold Medal.....₩ doz 4.00
Ideal.....₩ doz 4.00
Improved Bay State.....₩ doz 27.00@30.00
Little Star.....₩ doz 4.50
Monarch.....₩ doz 13.50
New Lightning.....₩ doz 5.50
Oriole.....₩ doz 4.00
Penn.....₩ doz 4.00
Perfection.....₩ doz 4.00
Pomona.....₩ doz 4.00
Rocking Table.....₩ doz 6.00
Turn Table.....₩ doz 4.50
Victor.....₩ doz 13.50
Waverly.....₩ doz 4.00
White Mountain.....₩ doz 4.00
72.....₩ doz 4.25
78.....₩ doz 7.00

Potato—

White Mountain.....₩ doz $4.50
Antrim Combination.....₩ doz $5.50
Hoosier.....₩ doz $13.50
Saratoga.....₩ doz $5.50

Pencils—

Faber's Carpenters'.....high list 50%
Faber's Round Gilt.....₩ gro $5.25
Dixon's Lead.....₩ gro $4.50
Dixon's Lumber.....₩ gro $6.75
Dixon's Carpenters'.....10%

Pencils, Soapstone—

See *Crayons.*

Pickers, Fruit—

Prize Fruit Pickers.....50%

Picks—

Railroad or Adze Eye, 5 to 6, $12.00; 6 to 7, $13.00.....60&10@60&10&10%

Picture Nails—

See *Nails, Picture.*

Pinking Irons—

See *Irons, Pinking.*

Pins—

Bow—

Humason, Beckley & Co.'s.....60&10%
Sargent & Co.'s, $17 and $18.....60&10%
Peck, Stow & W. Co.....50&10@50&10&5%

Curtain—

Silvered Glass.....net
White Enamel.....net

Escutcheon—

Iron, list Nov. 11, 1885..50&10@50&10&5%
Brass.....60@60&5%

Pipe, Wrought Iron—

List April 13, 1893.

1¼ and under, Plain.....57½&10%
1¼ and under, Galv.....50&10%
1½ and over, Plain.....67½&10%
1½ and over, Galv.....57½&10%
Boiler Tubes, list Oct. 24, 1892.....66&10%
Casing, list Nov. 16, 1892.....52½&10%
Inserted Joints Casing, list Nov. 16, 1892.....47½&5%
Steel Boiler Tubes.....27½&5%
Cold Drawn Seamless Steel Tubing..50%

Planes and Plane Irons—

Wood Planes—

Molding.....40@40&10%
Bench, First quality.....45@45&10%
Bench, Second quality.....50@50&10%
Bailey's (Stanley R. & L. Co.).....50&10%

Iron Planes—

Bailey's (Stanley R. & L. Co.).....50&10%
Miscellaneous Planes (Stanley R. & L. Co.).....25&10%
Steers' Iron Planes.....50@50&5%
Meriden Mal. Iron Co.'s.....50@50&5%
Davis' Iron Planes.....50@50&5%
Birmingham Plane Co.....60@60&5%
Gage Tool Co.'s Self-Setting...20&10&10%
Chaplin's Iron Planes.....50@50&5%
Sargent's.....60@60&10%
Standard Tool Co.....50@50&5%

Plane Irons—

Butcher's.....$5.00@$5.25 to $
Buck Bros.....30%
Auburn Thistle.....
Ohio.....
Sandusky.....
} .30&10@30&10&10%
L. & I. J. White.....20%
Stanley R. & L. Co.....50&10%

Plates—

Felloe.....₩ lb 6¢@6½¢

Pliers and Nippers—

Button's Patent.....60%
Hall's No. 2, 5 in., $13.50; No. 4, 7 in., $21.00 ₩ doz.....40%
Humason & Beckley Mfg. Co..50@50&10%
Lindsay's Giant.....33⅓%
Gas Pliers.....60%
Gas Pliers, Custar's Nickel Plated..60&5%
Eureka Pliers and Nippers.....40%
Russell's Parallel.....25%
P., S. & W. Cast Steel.....50%
P., S. & W. Tinners' Cutting Nippers, add 6%.....10%
Carew's Pat. Wire Cutters.....20%
Morrill's Parallel, ₩ doz, $12.00.....30&5%
Cronk's 3 in., $15.00; 10 in.....$20
Cronk's Button Pattern.....50&10@60%
Cronk's Carrier Pliers.....60@60&5%

Plumbs and Levels—

Regular List.....75&10@75&10&5%
Stanley's Duplex.....20&10%
Stanley's Handy.....20&10%
Disston's.....50%
Cook's.....40&10%
Pocket Levels.....70&10@70&10&10%
Davis Iron Levels.....30%
Davis Inclinometers.....10&10%

Poachers, Egg—

Buffalo Steam Egg Poachers, ₩ doz, No. 1, $6.00; No. 2, $9.00.....33⅓%
Silver & Co., 6-Ring, ₩ doz, $4.00; 8-Ring.....$2.00

Pokes, Animal—

Bishop s I. X. L.....₩ doz $6.00
Bishop's Monarch.....₩ doz $4.50
Bishop's Pioneer.....₩ doz $4.00
Bishop's American.....₩ doz $3.00
Eagle, Double Stale.....₩ doz $5.75
Eagle, Single Stale.....₩ doz $3.75
Buckeye, Single Stale.....₩ doz $2.75
Bolding.....₩ doz $6.00
Metallic Horse Poke.....₩ doz., $6.00

Police Goods—

R. I. Tool Co., Handcuffs, $15.00 ₩ doz 10%
R. I. Tool Co., Leg Irons, $25.00 ₩ doz 10%
Tower's.....25%
Davey's Improved Handcuffs; 2 Hands, Polished, ₩ doz, $48.00; Nickeled, $57.00; 3 hands, Polished, ₩ doz, $72.00; Nickeled, $84.00.....25%
J. P. Lovell's Police Goods.....25%

Polish—

Metal—

Prestoline.....80%
Prestoline Paste.....33⅓%
Gaston's Silver Compound.....33⅓%

Stove—

Joseph Dixon's.....₩ gro, $6.00, 10%
Gem.....₩ gro, $4.50, 10%
Gold Medal.....₩ gro, $6.00, 25%
Lustro.....₩ gro, $4.75
Ruby.....₩ gro, $3.75
Rising Sun, 5 gro lots.....₩ gro $5.50
Dixon's Plumbago.....₩ lb 8¢
Boynton's Noon Day.....₩ gro $18.00
Parlor Pride Stove Enamel, ₩ gro
Yates' Liquid, 2 3 5 10 gal
₩ gal..$0.80 .70 .60 .50
Yates Standard Paste Polish, 10 lb cans, ₩ lb 12½¢
Jet Black.....₩ gro $3.50
Japanese.....₩ gro $3.50
Fireside.....₩ gro $2.50
Diamond O. K. Enamel.....₩ gro $19.00
Bonnell's Liquid Stove Polish, ₩ gro $9.00
Bonnell's Paste Stove Polish, ₩ gro $6.00
Black Eagle Benzine Paste, 5 and 10 lb cans.....12½¢
Black Jack Water Paste, 5 and 10 lb cans.....12½¢
Nickel Plate Paste.....₩ gro $6.00
Crown Paste.....₩ gro $7.20
Crown Paste in 5 and 10 lb pails, ₩ lb 12¢
Black Flag.....₩ gro $7.20
Black Flag, 5 and 10 lb pails.....₩ lb 12¢
Black Flag, liquid, in bottles, ₩ gro $8.00
Diamond Rock Nickel Cleaner.....₩ gro $10.80
Raven Liquid, 6 oz. bottles.....₩ gro $8.00
Raven Liquid, 8 oz. bottles.....₩ gro $9.00
Raven Water Polish, large boxes.....₩ gro $7.20
Raven Paste in 5 lb. pails (cases of 6 pails), ₩ lb 10¢

Poppers, Corn—

Round or Square,
1 qt.....₩ doz $1.00; ₩ gr $8.00
1½ qt.....₩ doz $1.00; ₩ gr $9.00
2 qt.....₩ doz $1.50; ₩ gr $14.00

Post Hole and Tree Augers and Diggers—

See *Diggers, Post Hole, &c.*

Potato Parers—

See *Parers, Potato.*

Pots—

Glue—

Tinned.....40&10@40&10&5%
Enameled.....40&10@40&10&5%
Family, Howe's "Eureka".....40%
Family, L. F. C.'s "Handy".....50%

Powder—

In Canisters—

Fine Sporting, 1 lb each	0.90
Duck, 1 lb each	.60
Rifle, 1 lb each	.30
Rifle, ½ lb each	.18

In Kegs—

Rifle, 25-lb kegs	$3.50
Rifle, 12½-lb kegs	2.00
Rifle, 6¼ lb kegs	1.15
Duck, 25-lb kegs	11.00
Duck, 12½-lb kegs	5.75
Duck 6¼ lb kegs	3.00

Presses—

Fruit and Jelly—

Enterprise Mfg. Co.....25%
Xenia.....₩ doz $3.50
Shepard's Queen City.....40%
Silver & Co.....₩ doz $2.75

Pruning Hooks and Shears—See *Shears.*

Pullers, Nail—

Scranton.. ..₩ doz., $18.00, 33⅓%
Giant, No. 1.....₩ doz., $18.00, 10%
Giant, No. 2.....₩ doz., $15.00, 10%
Pelican.....₩ doz., $9.00, 25%
Eclipse.....Each, $2.00, net
Economy.....₩ doz., $6.00

Pulleys—

Hot House, Awning, &c.....66⅔@70%
Japanned Screw.....60&10&10%
Brass Screw.....70%
Japanned Side.....60&10&10%
Moore's Side, Anti Friction 50%
Moore's Ceiling or End, Anti-Friction 40%
Moore's Dumb Waiter, Anti-Friction 50%
Moore's Electric Light ... .33⅓%
Japanned Clothes Line.....60&10%
Hay Fork, Solid Eye, $4.00; Swivel, $4.50.....50&10&10&5%
Hay Fork, "Anti-Friction," 5 in. solid, $5.70.....50%
Hay Fork, "F" Common and Patent Bushed.....20%
Hay Fork, Tarbox Pat. Iron.....20%
Hay Fork, Reed's Self-Lubricating....60%
Hay Fork, Moore's Anti-Friction 5 in. Wheel, ₩ doz., $12.00.....40%
Shade Rack.....45%
Tackle Blocks—See Blocks.
Shepard's Niagara, No. 25..₩ doz 23¢ net
Sash (Auger Mortise).
Common Sense.....60%
Empire.....60%
Ideal, Nos. 2, 4, 10 & 16 } 30% less 1¢ ₩
Acme..... } doz net.
Star.....
On bbl. lots extra 5%.
Ideal, Nos. 25 and 55. ..₩ doz. 22¢ net.

Pumps—

Cistern, Best Makers..... .60@60&10%
Pitcher Spout, Best Makers.....67½@70%
Pitcher Spout, Cheaper G'ds..75@75&10%

Punches—

Saddler's or Drive, good..₩ doz., 60@65%
Bemis & Call Co.'s Cast Steel Drive.50&5%
Bemis & Call Co.'s Springfield Socket..65%
Spring, good quality..₩ doz., $2.50@$2.60
Spring, Leach's Pat 15%
Bemis & Call Co.'s Spring.....50&5%
Bemis & Call Co.'s Check.....55%
Solid Tinners', P., S. & W. Co., ₩ doz., $1.44.....55%
Tinners' Hollow Punches, P., S. & W. Co.....20&2%
Rice Hand Punches.....15%
Avery's Revolving.....40%
Avery's Sawset and Punch—See Sawsets
Niagara Hollow Punches.....20&2%
Niagara Solid Punches.....55%

Rail—

Sliding Door, Wr't Brass....₩ ℔, 35¢, 40%
Sliding Door, Bronzed Wr't Iron..₩ ft., 7¢
Sliding Door, Iron, Painted..₩ ft., 4¢, 40%
Barn Door, Light..In. ½ ⅝ ¾
Per 100 feet.....$2.00 2.50 3.10, 10%
B. D. for N. E. Hangers—
Small. Med. Large.
Per 100 feet.....$3.15 2.70 3.25 Net
Terry's Steel Rail..... ₩ ft., 4½¢
Victor Track Rail, 7¢ ₩ foot.....50&2%
Carrier, double braced, Steel Rail, ₩ foot.....3½@4¢
Lundy Parlor Door, Planed Edge, ₩ ft.7¢
Moore's Steel Rail.....25&10%
Moody Steel Rail ₩ ft., 5¢..... .....45%

Rakes—

Cast Steel, Association g'ds..70@70&5&2%
Cast Steel, outside g'ds,.....70@70&5&2%
Malleable.....70@70&5%
Gibbs' Lawn Rake.....₩ doz., $4.90
Gibbs' Canton Lawn Rake...₩ doz., $3.75
Gibbs' Acme Lawn Rake....₩ doz., $4.75
Gibbs' Favorite Lawn Rake.₩ doz., $3.90
Gibbs' Crown Lawn Rake, No. 1..... ₩ doz., $4.90; No. 2, $5.40
Oneida Lawn Rake .....₩ doz., $3.00
Fort Madison Prize Bow Brace and Peerless.....65%
Fort Madison Steel Tooth Lawn Rake, $6.00..... .....25%

Razors—

J. R. Torrey Razor Co 20%
Wostenholm and Butcher, $10 to $....10%
Jordan's AAA1, new list..... Net
Jordan's Old Faithful, new list.....Net
Galvanic.....₩ doz., $15.00
Electric Cutlery Co..... .....Net
Campbell Cutlery Co..... .....60%

Razor Strops—

See *Strops, Razor.*

Registers —

Moore's Japanned.....75%
Moore's Electroplated..... .....75%
Moore's Bronze Finishes..... .....70%
Moore's Solid Bronze... ....65%
Moore's Stove Pipe... .....33⅓%

Rings and Ringers—

Bull Rings—

Union Nut Co.....55%
Sargent's.....75&10%
Hotchkiss' low list.....30%
Humason, Beckley & Co.'s.....70&10%
Peck, Stow & W. Co.'s..50&10@50&10&10%
Ellrich Hdw. Co., White Metal, low list. 50@50&10%

Hog—

Top of the Hill Ringers.....₩ doz $2.00
Top of the Hill Rings.....₩ doz $1.25
Hill's Improved Ringers.....₩ doz $1.25
Hill's Old Style Ringers.....₩ doz $1.12½
Hill's Tongs.....₩ doz $3.00
Hill's Rings.....₩ doz bxs $1.00
Perfect Rings.....₩ doz bxs $1.50
Perfect Ringers.....₩ doz $2.15@$2.25
Blair's Hog Ringers.....₩ doz $2.00
Blair's Hog Rings.....₩ doz 90¢@$1.00
Champion Ringers.....₩ doz $2.00
Champion Rings, Double.....₩ doz $2.25
Brown's Ringers .....₩ doz $2.00
Brown's Rings .....₩ doz $1.15@$1.25
Electric Hog Rings.....₩ doz boxes $1.50
Electric Hog Ringers.....₩ doz $2.00
Major Rings .....₩ doz $1.25
Major Ringers.....₩ doz $2.00

Rivets and Burrs—

Norway Iron list Nov. 17, '87....60&10%
Second quality.....70%
Copper .....60@60&10%
Coppered Iron, Bettina Brand. .50&5%

Rivet Sets—See *Sets.*

Roasting and Baking Pans—See *Pans, Roasting and Baking.*

Rods—

Stair, Brass.....25@30%
Stair, Black Walnut.....₩ doz 40¢

Rollers—

Barn Door, Sargent's list. ....60&10&10%
Acme Moore's Anti-Friction.....55%
Union Barn Door Roller.... .....70%
Moore's Barn Door Stay.....50%
Thompson Mfg. Co.'s Lawn Rollers ..30%

Rope—The following prices are f.o.b., New York or factory, and are shaded ¼¢@½¢ on large lots; terms, 1½% for cash.

Manila, 7-16 in. diam. and larger₩ ℔ 9 ¢
Manila.....⅜ in. ₩ ℔ 9½¢
Manila.....¼ and 5-16 in. ₩ ℔ 10 ¢
Manila, Tarred Rope.....₩ ℔ 8½¢
Manila, Hay Rope.....₩ ℔ 8½¢
Sisal.....7-16 inch and larger ₩ ℔ 7½¢
Sisal.....⅜ in. ₩ ℔ 8 ¢
Sisal.....¼ and 5-16 in. ₩ ℔ 8½¢
Sisal, Hay Rope.....₩ ℔ 7½¢
Sisal, Tarred Rope.....₩ ℔ 7 ¢
Sisal, Medium Lath Yarn.....₩ ℔ 7 ¢
New Zealand..7-16 in. & larger ₩ ℔ 7 ¢
New Zealand.....⅜ inch, ₩ ℔ 7½¢
New Zealand..¼ and 5-16 inch, ₩ ℔ 7¾¢
New Zealand, Hay Rope.....₩ ℔ 6¾¢
New Zealand, Tarred Rope.... ₩ ℔ 6½¢
Cotton Rope.....₩ ℔ 13½@16¢
Jute Rope..... ....₩ ℔ 6½@7¢

Wire—

List February, 1892. All kinds.....45%

Rules—

Boxwood.. .. .80&10&10@80&10&10&10%
Ivory.....50&10%
Starrett's Steel Rules and Straight Edges.....25&10%

Sad Irons—See *Irons, Sad.*

Sand and Emery Paper and Cloth—

See *Paper and Cloth.*

Sash Cord—See *Cord, Sash.*

Sash Locks—*See Locks, Sash.*

Sash Weights—

See *Weights, Sash.*

Sausage Stuffers or Fillers—See *Stuffers or Fillers, Sausage.*

Saws—

Disston's Circular.....45@45&5%
Disston's Cross Cut, list Jan. 1,'93.40&10%
Disston's Hand.....25%
Woodrough & McParlin.
Hand, Panel and Rip.. .....25&10%
Cross Cuts, list Jan. 1, 1893.....45&10%
Wheeler, Madden & Clemson Mfg. Co.
Hand, Panel and Rip.....30&10%
Cross Cuts, list Jan. 1, 1893.....50&10%
Atkins' Circular..... .....40%
Atkins' Cross Cuts, new list. 40%
Atkins' Mulay, Mill and Drag.....50&10%
Atkins' One-Man Saw.....40%
Atkins' Wood Saws.....40%
Peace Circular and Mill.....45@45&5%
Peace Hand Panel and Rip.....25@25&5%
Peace Cross Cuts, list Jan. 1,'93...45&10%
Richardson's Circular and Mill.45@45&5%
Richardson's X Cuts, list Jan. 1,'93.45&10%
Richardson's Hand, &c . . .25@25&5%
C. E. Jennings & Co.'s brand. 25%

Hack Saws—

Griffin's, complete.....40&10&50
Griffin's Hack Saw Blades.....40&10&50
Star Hack Saws and Blades.....25%
Eureka and Crescent.....25%

Scroll—

Lester, complete, $10.00..... .....25%
Rogers, complete, $4.00..... .....25%
Barnes' Builders' and Cab Makers'$15,25%
Barnes' Scroll Saw Blades.....35%

Saw Frames—

See *Frames, Saw.*

Saw Sets—See *Sets, Saw.*

Saw Tools—See *Tools, Saw.*

Scales—

Hatch, Counter, No. 171, good quality, ₩ doz $18.00@$19.00
Hatch, Tea, No. 161....₩ doz $6.50@$7.00
Union Platform, Plain.....$2.10@2.20
Union Platform, Striped.....$2.40@2.50
Chatillon's Grocers' Trip Scales.....50%
Chatillon's Eureka.....25%
Chatillon's Favorite.....40%
Family, Turnbulls.....30@30&10
Riehle Bros.' Platform.....40%

Scale Beams—

See *Beams, Scale.*

Scissors, Fluting.....45%

Scrapers—

Adjustable Box Scraper (S. R. & L. Co.) $6.00.....30&10%
Box, 1 Handle.....₩ doz $2.25@$2.50
Box, 2 Handle.....₩ doz $3.00@$3.25
Defiance Box and Ship..... .....20&10%
Foot..... .....50&10&60%
Ship, Common..... ....₩ doz $3.50 net
Ship, R. I. Tool Co..... .....10%

Screen Window and Door Frames—See *Frames*

Screw Drivers—

See *Drivers, Screw*

Screws—

Bench and Hand—

Bench, Iron..... ....55&10@55&10&10%
Bench, Wood, Beech.... .....₩ doz $2.25
Bench, Wood, Hickory.....20&10%
Hand, Wood..... .....25&10@25&10&5%
Hand, Grand Rapids, list.....35%

Coach, Lag and Hand-Rail—

Lag, Blunt Point, list Jan. 1, 1890..... 80@80&10%
Coach and Lag, Gimlet Point, list Jan. 1, 1890..... .....80@80&5%
Hand Rail, Sargent's..... .....70&10%
Hand Rail, H. & B. Mfg. Co....70&10@75%
Hand Rail, Am. Screw Co..... .....75%

Jack Screws—

Jack Screws, Millers Falls list.50@50&10%
Jack Screws, P., S. & W.....35%
Jack Screws, Sargent.....70%
Jack Screws, Stearns'.....40@40&10%

Cork—

Humason & Beckley Mfg. Co..40&10@50%
Williamson's.....33⅓@33⅓&5%
Detroit Cork Screw Co.....33⅓%

Machine—

Flat Head Iron.....65%
Round Head Iron.....60%

Wood—

List January 1, 1891.
Flat Head Iron.....70%
Round Head Iron.....65%
Flat Head Brass.....70%
Round Head Brass.....65%
Flat Head Bronze.....70%
Round Head, Bronze' ...65%
} Extra 10 or 10& 10% often given.
Rogers' Drive Screws.....82½%

Scroll Saws—See *Saws, Scroll.*

Scythes—

Grain.....40&5@40&10%
Grass.....40&10&50%

Scythe Snaths—

See *Snaths, Scythe.*

Sets—

Awl and Tool—

Aiken's Sets, Awls and Tools, No. 20, ₩ doz$10.00..... .....60@60&5%
Fray's Adj. Tool Hdls., Nos. 1, $12; 2, $18; 3, $12; 4, $9.....45%
Millers Falls Adj. Tool Hdls., Nos. 1, $12; 2, $18.....25%
Henry's Combination Haft...₩ doz $6.50
Stanley's Excelsior:
No. 1, $7.50; No. 2, $4.00; No. 3, $5.50.....30&10%
Common Brad Sets,
No. 42, $10.50; No. 43, $12.50...70&10&5%

Nail—

Square.....₩ gr. $4.00@$4.25
Round.....₩ gr. $3.25
Buck Bros.....27½%
Cannon's Diamond Point...₩ gr. $12, 20%

Rivet—

Regular list..... .....70%

Saw—

Stillman's Genuine....₩ doz $5.00@7.75, 40&5%
Stillman's Pattern, Hand, ₩ doz $3.25; Cross Cut, $6.50.....55@55&10%
Common Lever.....₩ doz $2.00, 45@50%
Morrill's No. 1, $15.00.....40&20%
No. 11, $16.00.....40&20%
Nos. 3 and 4, Cross Cut, $23.00..40&20%
No. 5, Mill, $31.00.....40&20%
No. 10, $15.50.....40&20%
Leach's..No. 0, $8.00; No. 1, $15...15@20%
Nash's.....20&10@20&10&10
Hammer, Hotchkiss.....$5.50, 10%
Hammer, Bemis & Call Co.'s new Pat.45%
Bemis & Call Spring Hammer..... 30&5%
Bemis & Call Co.'s Plate.....20%
Bemis & Call Co.'s Cross Cut.....30&5%
Aiken's Genuine.....$13.00, 55@55&10%
Aiken's Imitation.....$9.00, 55@55&10%
Hart's Pat. Lever.....20%
Disston's Star..... .....25%
Leopold.....40&10@50%
Atkin's Lever.....₩ doz No. 1, $6.00
Atkin's Criterion.....₩ doz No. 1, $6.00
Croissant (Keller), No. 1, $15.00; No. 2, $24.00.....40&10@50%
Avery's Saw Set and Punch.....50%
Kohler's Royal.....₩ doz $7.00
Kohler's Giant Royal.....₩ doz $12.00
Crescent.....₩ doz $3.00
Lloyd's Acme.....₩ doz $15, 40&10%
Taintor Positive.....₩ doz $18, 50%

Sharpeners, Knife—

Larkins'.
Applewood Handles...₩ doz. $6.00, 40%
Rosewood or Cocobola. ₩ doz. $9.00 40%

Shaves, Spoke—

Iron.....45%
Wood.....30%
Bailey's (Stanley R. & L. Co.).....40&10%
Stearns'.....30&10%
Cincinnati.....25&10%
Goodell's ₩ doz. $9.00.....25%

Shears—

American (Cast) Iron..75&10@75&10&5%
Barnard's Lamp Trimmers..₩ doz. $3.75
Seymour's, List Dec. 1881. 60&10&10@60&10&10&5%
Heinisch's, List Dec. 1881. 60&10&10@60&10&10&5
Heinisch's Tailor's Shears.....33⅓%
Cast Steel Trimmers:
First quality.....80@80&10%
Second quality.....80&10@80&10&10%
Acme Cast Shears.....10&10%
Diamond Cast Shears.....10%
Clipper.....10&10%
Victor Cast Shears.....75&10@75&10&5%
Howe Bros. & Hulbert, Solid Forged Steel.....40%
Hatch Cutlery Co., Solid Steel Forged.60%
Davenport Cutlery Co.. ... 60@60&10%
Clauss Brand Japanned..... 70%
Clauss brand, Nickeled, same list.....60%
Galvanic 8½ to 9 in., ₩ doz. $1.00 ₩ inch
Electric Cutlery Co. . . . Net
Campbell Cutlery Co., Jap'd 75%
Nickel Plated.....65%

Tinners' Snips—

Wrt. Handles, Steel Blades ..20@20&10%
Niagara Snips and Shears. ..20&10%
Cast Handles, Laid with Steel 40%

Pruning Shears and Hooks—

Disston's Combined Pruning Hook and Saw.....₩ doz. $12.00, 20&10%
Disston's Pruning Hook, ₩ doz. $12.00 20&10%
E.S.Lee & Co.'s Pruning Tools.50&10@70%
Pruning Shears, Henry's Pat., ₩ doz. $3.75@$4.00
Henry's Pruning Shears, ₩ doz. $4.25 @$4.5
Wheeler, M. & C. Co., Combination, ₩ doz $12.00
Dunlap's Saw and Chisel, ₩ doz $8.50, 30%
J. Mallinson & Co., No. 1, $5.25; No. 2, $7.25
P., S. & W. Co..... .....60%
Levin Pruner No. 1, $15.00 ₩ doz 40&3%
Levin Pruner No. 2, $21.00 ₩ doz...40&3%

Tinners', &c.—

Shears and Snips (P. S. & W.).....30@35%
Snips, J. Mallinson & Co.....33⅓%

Sheaves—

Sliding Door—

M. W. Co., list July, 1888....50&10@60&5%
R. & E., list Dec. 16, 1885.....55&20%
Corbin's list.....60&10&3%
Patent Roller.....60&10&3%
Patent Roller, Hatfield's.....75%
Russell's Anti-Friction, list Dec. 18, 1885 .....60&3%
Moore's Anti-Friction.....50%

Sliding Shutter—

R. & E., list Dec. 18, 1885.....60&10&3%
Sargent's list..... .....70%
Reading list.....60&10&10%

Shells—

First quality 4, 8, 10 and 12 gauge 25&10&3%
First quality Rival, Club and Climax brands, 14, 16 and 20 gauge ($7.50 list) .....20&10&3%
Prize.....40&3%
Star, Club, Rival and Climax Brands... 33⅓&10&3%
Smokeless brand, 12, 10, 16 gauge. 33⅓&10&2½
Trap brand, 12 and 10 gauge..33⅓&10&3%
Selbold's Comb. Shot Shells.....15&3%
Brass Shot Shells, 1st quality.....60&3%
Brass Shot Shells, Club, Rival, Climax. 65&3%

Shells, Loaded—

Standard List, July 19, 1890..... 40&10&10@40&10&10%

Ship Tools—

L. & I. J. White.....20&5%

Shoes, Horse, Mule, &c.—

Horse—

Burden's, Perkins', Phœnix, Standard, Diamond State, Bryden's Boss and Crescent, at factory.....$4.00
Bryden's Frog Pressure, at factory..$5.00

Mule—

Add $1 ₩ keg to above prices.

Ox Wrought—

Ton lots..... .....₩ ℔ 9¢
1000 ℔ lots.....₩ ℔ 9½¢
500 ℔ lots.....₩ ℔ 10¢

Shot—

Small lots.
Drop, up to B, 25-℔ bag.....$1.45
Drop, up to B, 5-℔ bag..... .35
Drop, B and larger, 25-℔ bag..... 1.70
Drop, B and larger, 5-℔ bag..... .40
Buck and Chilled, 25-℔ bag..... 1.70
Buck and Chilled, 5-℔ bag .40
Dust Shot, 25-℔ bag..... 2.00
Dust Shot, 5-℔ bag..... .45
In ton lots, 5% discount of 5 cts. per bag (25 ℔'s) made.

Shovels and Spades—

Ames' Shovels, Spades, &c., list Nov. 1, 1885..... .....30%
NOTE.—Jobbers frequently give 5@7½% extra on above.
Griffith's Black Iron.....50&10%
Griffith's C. S. .....60@60&5%
Griffith's Solid C. S. R. R. Goods.....30%
St. Louis Shovel Co. .....20@20@7½%
Hussey, Binns & Co..... .....15@20%
Hubbard & Co.... .....20@20@7½%
Lehigh Mfg. Co.....50&10%
H. M. Myers Co.....30%
Payne Pettebone & Son.....33⅓&5%
Remington's (Lowman's Pat.)40&10@50%
Rowland's Black Iron..50&10@50&10&5%
Rowland's Steel..... .....60&5@60&10%
Terra Haute Shovel & 25%

Shovels and Tongs—

Iron Head.....60&10@60&10&5%
Brass Head..... .....60&10&10%

Sieves and Sifters—

Mann's Tin Rim..... .....50&25%
Buffalo Metallic, S. S. & Co.. 50&25&20%
Shaker (Barler's Pat.) Flour Sifters ₩ gr $21.00
Electric Light..₩ doz $1.50; ₩ gro $15.00
A. & W. Sifters . . .₩ gr $15.00
Hunter's Genuine.₩ doz $1.75, ₩ gr $16.50
Hunter's Imitation..... ₩ doz $1.75; ₩ gr $15.00

Sieves, Wooden Rim—

	Iron	Plated
Mesh 18, Nested, ₩ doz....	$0.80	$1.00
Mesh 20, Nested, ₩ doz....	.95	1.10
Mesh 24, Nested, ₩ doz..	1.15	1.25

Sinks, Wrought Steel—

Columbus, Painted or Unpainted..... 30@30&10 %
Columbus, Galvanized and Enameled. 50@50&10 %
New Era, Painted.....40&10@50&5 %
New Era, Galvanized and Enameled... 60&10&10@70&5 %

Skeins, Thimble—

Western list.....75&5@75&10%
Columbus Wrt. Steel..Special net prices
Coldbrookdale Iron Co.....60%
Seneca Falls Pattern.....60%
Utica P. S. T. Skeins.....60%
Utica Turned and Fitted.....25%

Slates—

School, by case..... .....40&10@50%
Large lots..... .....50&10&10%

Slaw Cutters—See *Cutters.*

Sleds Hand—

Tubular Steel .....₩ doz $24.00 40&50
Lots of 6 doz 50%

Snaps, Harness, &c.—

Anchor (T. & S. Mfg. Co.)....65%
Fitch's (Bristol)....50&10%
Hotchkiss....10%
Andrews....50%
Sargent's Patent Guarded....70&10&10%
German, new list....40&10%
Covert....50&10&5&2%
Covert, New Patent....50&10&5&2%
Covert, New R. E....60&10&5&2%
Covered Spring....60&10&10%
Covert's Saddlery Works' Triumph 33⅓%
John Protz Snaps....75@75&5%
Kelley & Woolworth's Steel Harness....50&10@60%

Snaths—

Scythe....50&2@50&5&2%

Soldering Irons—

See *Irons, Soldering.*

Spittoons, Cuspidors, &c.

Standard Fiberware—

Cuspidors, 8½-inch, ₩ doz., No. 5, $3; No. 5X, $9.
Spittoons, Daisy, 8-inch, No. 1, 4; 10 and 11 inch, $6.

Spoke Shaves—

See *Shaves, Spoke.*

Spoke Trimmers—

See *Trimmers, Spoke.*

Spoons and Forks—

Tinned Iron—

Easting, Cen. Stamp. Co.'s list....70&10%
Solid Table and Tea, Cen. Stamp. Co.'s list....70&10%
Buffalo, S. S. & Co....33⅓&2%

Silver Plated—

4 months or 5% cash 30 days:
Meriden Brit. Co., Rogers....40&15%
C. Rogers & Bros....40&15%
Rogers & Bros....40&15%
Reed & Barton....40@40&5%
Wm. Rogers Mfg. Co....40, 15&5%
Simpson, Hall, Miller & Co....40, 15&5%
Holmes & Edwards Silver Co....40, 15&5%
L. Boardman & Son....50&12½%

Miscellaneous—

Holmes & Edwards Silver Co.:
No. 67 Mexican Silver....50&10&5%
No. 30 Silver Metal....50&10&5%
No. 24 German Silver....50&10&5%
No. 50 Nickel Silver....50&5%
No. 49 Nickel Silver....50&10&5%
Wm. Rogers Mfg. Co.:
Rogers' Silver Metal....50&10&6%
18% Rogers' German Silver....60&6%
22% Rogers' Nickel Silver....50&6%
German Silver....50@50&5%
German Silver, Hall & Elton..50&5% cash
Nickel Silver....50&5@50&10&5% cash
Brittannia....60@60&5%
Boardman's Nickel Silver, list July 1, 1891....60&7½&5%
Boardman's Brittannia Spoons, case lots....60&5% cash

Springs—

Door—

Torrey's Rod, 39 in....₩ doz $1.20@1.2
Warner's No. 1, ₩ doz $1.50; No. 2, $3.40....55@55&10%
Gem (Coil), list April 19, 1886....20%
Star (Coil), list April 19, 1886....20&10%
Victor (Coil)....60&10@60&10&5%
Champion (Coil)....60&10@60&10&10%
Gowell's, No. 1, ₩ doz $18.00; No. 2, $15.00....50@50&10%
Rubber, complete, ₩ doz $4.50....55&10%
Hercules....50@50&10%
Phœnix....33⅓%

Carriage, Wagon, &c.—

Elliptic, Concord, Platform and Half Scroll....60&10@60&10&10&10 or net prices
Cliff's Bolster Springs....25%

Squares—

Steel and Iron, Nickel-Plated....80&10&10@80&25%
Try Square and T Bevels....60&10&10%
Disston's Try Square and T Bevels....50%
Winterbottom's Try and Miter....30&10%
Starrett's Micrometer Caliper Squares. 25%
Avery's Flush Bevel Squares....40%
Avery's Bevel Protractor....50%

Squeezers—

Fodder—

Blair's....₩ doz $2.00
Blair's "Climax"....₩ doz $1.25

Lemon—

orcelain Lined, No. 1....₩ doz $6.00 25&30%
Wood, No. 2....₩ doz $3.00, 35%
Wood, Common....₩ doz $1.70@1.75
Dunlap's Improved....₩ doz $3.75, 20%
Sammis....No. 1, $5.00; No. 2, $9; 12, $18 ₩ doz....25&10%
Jennings' Star....₩ doz $2.50
The Boss....₩ doz $2.50
Dean's..Nos. 1, ₩ doz $6.50; 2, $3.35; 3, $1.90; Queen, $2.50
Little Giant....50@50&5%
King....40&5%
Hotchkiss Straight Flush....₩ doz $12.00
Silver & Co., Glass....₩ gro. $9.00

Standard Fiber Ware—

See *Ware, Standard Fiber.*

Staples—

Barbed Blind, ½ in. and larger, ₩ ℔ 7@7½¢
Barbed Blind, ¾ in....₩ ℔ 8@8½¢
Fence Staples, Galvanized, Fence Staples Plain, Same price as B'rb Wire SeeTrd.Rep
Grand Crossing Tack Co.'s list....75&10%

Steelyards....40&10@50%

Stocks and Dies—

Blacksmith's:
Waterford Goods....35%
Butterfield's Goods....35%
Lightning Screw Plate....25@30%
Reece's New Screw Plates....25@30%
Reversible Ratchet....30%
Gardner....25%
Green River....35@30%

Stops, Bench—

Morrill's, ₩ doz. No. 1, $10.00; No. 2, $11.00 40&20%
Hotchkiss's....₩ doz $5, 10@10&10%
Weston's, No. 1 @ No. 2, $9, 25&10&5%
McGill's, ₩ doz $3....10%
Cincinnati....25&10
Terrell's Nos. 1 and 2, ₩ doz., $3; No. 3, $3.60....80%
Millers Falls....25%
Stearns'....20&10%

Stone—

Stones, Grind—See *Grindstones.*

Scythe Stones—

Pike Mfg. Co., list April, 1892....33⅓&5%
Cleveland Stone Co., list Nov. 1892..33⅓&5%

Oil Stones, &c.—

Pike Mfg. Co:
Hindostan No. 1, ₩ ℔....8¢
Sand Stone....5¢
Turkey Oil Stone, 4 to 8 in....80¢
Turkey Slips....$2.00
} 40 @ 40& 10%

Lily White Washita....60¢
Rosy Red Washita....60¢
Washita Stone, Extra....50¢
Washita Stone, No. 1....40¢
Washita Stone, No. 2....30¢
Lily White Slips....90¢
Rosy Red Slips....90¢
Washita Slips, Extra....80¢
Washita Slips, No. 1....70¢
Arkansas Stone, No. 1, 3 to 5½ in., $2.80
Arkansas Stone, No. 1 5½ to 8 in., $3.50
} 33⅓@33⅓&10%

Lake Superior....₩ ℔ 13¢
Lake Superior Slips....₩ ℔ 20¢

Stove Polish—

See *Polish, Stove.*

Stretchers Carpet—

Cast Steel, Polished....₩ doz $2.2
Cast Iron, Steel Points....₩ doz 75@80¢
Socket....₩ doz $1.75
Bullard's....25@25&10%

Strops, Razor—

Genuine Emerson....60@60&5%
Imitation " ..₩ doz $2.00, 20&10&5%
Torrey's....20%
Badger's Belt and Com....₩ doz $2.00
Lamont Combination....₩ doz $4.00
Jordan's Pat. Padded, list Nov. 1, '89, 50%
Electric Cutlery Co....Net
Campbell Cutlery Co....Net

Stuffer, Sausage—

Miles' Challenge, ₩ doz $20....50@50&5%
Perry....₩ doz, No. 1, $15.00; No. 0, $21.00....50&5@50&10%
Draw Cut No. 4, each $30.00....20%
Enterprise Mfg. Co., list Jan 17, '93..25%
Silver's....40&10%

Sweepers, Carpet and Lawn—

Carpet—

Bissell No. 5....₩ doz $17.00
Bissell No. 8....₩ doz $20.00
Bissell, Grand....₩ doz $36.00
Standard....₩ doz $24.00
Domestic....₩ doz $21.00
Domestic, No. 2....₩ doz $22.00
Grand Rapids....₩ doz $24.00
Crown Jewel, No. 1, $18.00; No. 2, $19.00; No. 3, $20.00
Magic....₩ doz $15.00
Improved Parlor Queen, Nickeled....₩ doz $27.00
Japanned....₩ doz $24.00
Excelsior....₩ doz $22.00
Garland....₩ doz $18.00
Parlor Queen....₩ doz $24.00
Housewife's Delight....₩ doz $15.00
Ladies' Friend....₩ doz $15.00
Ladies' Friend No. 2....₩ doz $16.00
Advance....₩ doz $18.00
Our Leader....₩ doz $19.00
Triumph....₩ doz $20.00
Goshen....₩ doz $21.00
Supreme....₩ doz $22.00
Easy....₩ doz $22.00
Gilt Edge....₩ doz $24.00
Acme....₩ doz $26.00
Imperial....₩ doz $26.00
Grand Republic....₩ doz $30.00
Banner....₩ doz $22.00
The Star....₩ doz $21.00
Reliable....₩ doz $22.00
The Rapid....₩ doz $22.00
Our Own....₩ doz $27.00
Model....₩ doz $27.00
Goshen Sweeper Company, Grand Rapids, Mich., make the following rebates:
5 dozen in 6 months....₩ doz $1.00
10 dozen in 6 months....₩ doz $2.00
25 dozen in 6 months....₩ doz $3.00
Except on L.F.,when 10 dozen price is $13.50, and 25 dozen $13.00.

Lawn—

Thompson Mfg. Co....30%

Swings—

Davies Lawn....25%

Tacks, Brads &c.—

List October 19, 1889. Old established straight Weights. Short Weight goods are sold at lower prices.

Carpet Tacks—
American, Blued....66⅔%
American, Tin'd and Cop'd....70%
Steel, Bright and Blued....66⅔%
Steel, Tinned and Coppered....70%
Swedes Iron, Blued....72½%
Swedes Iron, Tinned....75%
American Iron Tacks, Domestic.66⅔%
Swedes Iron Tacks—
S. S., Blued....66⅔%
S. S., Tinned....70%
Lanc., Blued....55%
Lanc., Tinned....60%
Gimp and Lace Tacks—
S. S., Blued....62½%
S. S., Tinned....66⅔%
Lanc., Blued....55%
Lanc., Tinned....60%
Basket and Trimmers' Tacks—
Lanc....52½%
S. S....55%
Hungarian Nails....60%
Common and Patent Brads....55%
Leathered Tacks....10%
Brush Tacks, S. S....60%
Looking Glass Tacks, S. S....35%
Picture-Frame Points, S. S....35%
Finishing Nails....60%
Trunk and Clout Nails—
Black....65%
Tinned or Coppered....67½%
Basket Nails....60%
Chair Nails....62½%
Cigar Box Nails....45%
Tin Capped Nails....50%

} Extra discount 25&2%

Miscellaneous—

Double Point....90@90&10%
Wire Carpet Nails....50&10%
Claw Handle Carpet....₩ gross $4 00
Bonnie Blue....₩ box 1.50
Bill Nye Brad Box....4500
Parisian Gilt Nails, cartoon....50
Home Tacks, No. 50 ₩ case (12 cartons), $36.00; No. 100, ₩ case (12 cartons) $72.00.
Home Nails, No. 200, ₩ case (12 cartons), $30.00; No. 400, ₩ case (12 cartons), $60 00.
} 50&2%

Upholsterers' Nails....50&10%

Wire Brads and Nails

Steel-Wire Brads, R. & E. Mfg. Co.'s list 50&10%

See also *Nails, Wire.*

Tanks, Oil—

Emerald, S. S. & Co.: 30-gal.$8.75; 60-gal., $11 each....50&10&5%

Tapes, Measuring—

American....40@40&5%
Spring....40%
Chesterman's, Regular list....25@30%

Thermometers—

Tin Case....80@80&10%

Thimble Skeins—See *Skeins.*

Ties, Bale—Steel.

Standard Wire, list....50&10&5%

Tinners' Shears, &c —

See *Shears, Tinners' &c.*

Tinware—

Stamped, Japanned and Pieced, list Jan 20, 1887....70&10@70&25%

Tire Benders, Upsetters, &c.—See *Benders and Upsetters, Tire.*

Tobacco Cutters—

See *Cutters, Tobacco.*

Tools—

Coopers'—

Bradley's....20%
Barton's....20@20&5%
L. & I. J. White....20&5%
Albertson Mfg. Co....25%
Beatty's....30%
Sandusky Tool Co....30@30&5%
Shaves Cincinnati Tool Co....20%

Lumber—

Ring Peavies, "Blue Line"..₩ doz $20.00
Ring Peavies, Common....₩ doz $18.00
Steel Socket Peavies....₩ doz $21.00
Malt Iron Socket Peavies...₩ doz $19.00
Cant Hooks, "blue Line"....₩ doz $16.00
Cant Hooks, Common Finish..₩doz$14.00
Cant Hooks, Mall. Socket Clasp, "Blue Line" Finish....$16.00
Cant Hooks, Mall. Socket Clasp, Common Finish....₩ doz $14.50
Cant Hooks, Clip Clasp, "Blue Line" Finish....₩ doz $14.00
Cant Hooks, Clip Clasp, Common Finish....₩ doz $12.00
Hand Spikes....₩ doz 6 ft., $15.00; 8 ft., $20.00
Pike Poles, Pike & Hook, ₩ doz, 12 ft., $11.50; 14 ft., $12.50; 16 ft., $14.50; 18 ft., $17.50; 20 ft., $21.50.
Pike Poles, Pike only, ₩ doz, 12 ft., $10.00; 14 ft., $11.00; 16 ft., $13.00; 18 ft., $16.00; 20 ft., $20.00.
Pike Poles, not ironed, ₩ doz, 12 ft., $6.00; 14 ft., $7.00; 16 ft., $9.00; 18 ft., $12.00; 20 ft., $16.00.
Setting Poles, ₩ doz, 12 ft., $14.00; 14 ft., $15.00; 16 ft., $17.00.
Swamp Hooks....₩ doz $18.00

Saw—

Atkins', new list....40%

Transom Lifters—

See *Lifters, Transom.*

Traps—

Game—

Newhouse....40@40&5%
Oneida Pattern....70&10%
Game, Blake's Patent....40&10&5%

Mouse and Rat—

Mouse Wood, Choker, ₩ doz holes, 9@10¢
Mouse, Round Wire....₩ doz $1.50 10%
Mouse, Cage, Wire....₩ doz $2.50 10%
Mouse, Catch-'em-alive..₩ doz $2.50 15%
Mouse, Bonanza....₩ doz 0.90@$1.00
Rat, Decoy....₩ gr $10.00, 10%
Ideal....₩ gr $10.00
Cyclone....₩ gr $5.25
Hotchkiss Metallic Mouse, 5-hole traps, ₩ doz., 75¢; in full cases, ₩ doz.60@65¢
Hotchkiss Imp. Rat Killer...₩ gro $18.50
Hotchkiss New Rat Killer...₩ gro $16.50
Schuyler's Rat Killer....₩ gro $15.00
Dandy....₩ doz., $1.75
Waddel's Go Bang, ₩ gro....$12.50

Fly—

Harper, Champion or Paragon....₩ doz. $1.75, ₩ gro. $16.50
Balloon, Globe or Acme....₩ doz. $1.50, ₩ gro. $13.50

Triers—

Butter and Cheese....25%

Trimmers, Spoke—

Bonney's....₩ doz $10.00, 50%
Stearns'....20&10%
Ives', No. 1, $15.00; No. 2, $12.00 ₩ doz. 55&10%
Douglas'....₩ doz $9.00, 20%
Cincinnati....25%

Trowels—

Lothrop's Brick and Plastering, 20&10&5@35%
Reed's Brick and Plastering....15%
Disston's Br'k and Plastering..25@25&10%
Peace's Plastering....25@25&5%
Clement & Maynard's....20@20&5%
Rose's Brick....15@20%
Brade's Brick....25%
Worrall's Brick and Plastering....20%
Garden....70%
Cleves' Angle Trowel, ₩ gro, No. 1, $36; No. 2, $30; No. 3, $15. net @ 10%

Trucks, Warehouse, &c.—

B. & L. Block Co.'s list....40%
Thompson Mfg. Co....40%
Barnes' Barrel Trucks....40%

Tubes Boiler—

See Pipe

Twine—

Flax Twine—

	DC.	E.
No. 9, ¼ and ½ ℔ Balls	25¢	31¢
No. 12, ¼ and ½ ℔ Balls	22¢	30¢
No. 18, ¼ and ½ ℔ Balls	20¢	29¢
No. 24, ¼ and ½ ℔ Balls	20¢	29¢
No. 36, ¼ and ½ ℔ Balls	18¢	28¢

No. 264 Mattrass, ¼ and ½ ℔ Balls.52@54¢
Chalk Line, Cotton, ½ ℔ Balls....25¢
Mason Line, Linen, ½ ℔ Balls....55¢
2-Ply Hemp, ¼ and ½ ℔ Balls (Spring Twine)....15½¢
3-Ply Hemp, 1 ℔ Balls....16¢@16½¢
3-Ply Hemp, 1½ ℔ Balls....15¢@15½¢
Cotton Wrapping, 5 Balls to ℔..15¢@18¢
2, 3, 4 and 5 Ply Jute, ½ ℔ Balls....10¢
Wool....6½¢@6½¢
Paper....13¢@14¢
Cotton Mops, 6, 9, 12 and 15 ₩ to doz..18¢

Vises—

Solid Box....50&10@60%

Parallel—

Fisher & Norris Double Screw....15&10%
Stephens'....25@30%
Parker's....20@25%
Wilson's....55%
Howard's....40%
Bonney's....50%
Millers' Falls....40@40&10%
Trenton....40&5@40&10%
Merrill's....15@20%
Hollands'....35@40%
Sargent's....70&10%
Backus and Union....40%
Double Screw Leg....15&10%
Prentiss....20@25%
Simpson's Adjustable....40%
Moore's....20%
Massey Quick Action....20@25%

Saw Filers—

Bonney's, Nos. 2 & 3, $15.00....40&10@50
Stearn's....33⅓&10@33⅓&10&10%
Stearn's Silent Saw Vises....33⅓@35%
Hopkins'....₩ doz $17.50, 10%
Reading....40&10%
Wentworth....20&10%
Economy, ₩ doz., Nos. 110, $10.00; 120, $15.00....50&10&10&5%

Miscellaneous—

Phœnix Vises....33⅓%
Phœnix Hand Vises....₩ doz $3.60, 33⅓%
Cowell Hand Vises....20%
Bauer's Pipe Vises....10%
Cincinnati....25&10%
Enterprise Pipe Vises....each $3.00, 40%
Massey Combination Pipe Vise....40%

Wads—Price Per M.

U.M.C.&W.R.A.—B. E., 11 up.. 68¢
U.M.C.&W.R.A.—B. E., 9&10.. 82¢
U.M.C.&W.R.A.—B. E., 8.... 96¢
U.M.C.&W.R.A.—B. E., 7....$1.10
U.M.C.&W.R.A.—P. E., 11 up. 1.15
U.M.C.&W.R.A.—P. E., 9&10.. 1.50
U.M.C.&W.R.A.—P. E., 8.... 1.70
U.M.C.&W.R.A—P. E., 7.... 1.80
Eley's B. E., 11 and larger....$1.70@1.75
Eley s P. E., 12 to 20.... 3.00@ 3.25

} Dis.20&2%

Wagon Boxes—

See *Boxes, Wagon.*

Wagon Jacks—

See *Jacks, Wagon.*

Ware, Hollow—

Cast Iron, Hollow—

Stove Hollow-Ware—
Ground....60&10@60&10&10%
Unground....65&10@70&5%
White Enameled Ware—
Maslin Kettles....70&10@70%
Boilers and Saucepans....60@60&5%
Tinned Boilers and S'pans....60@60&5%
Rustless Hollow Ware....60@50&5%
Gray Enameled Ware—
Stove....
Maslin Kettles....60&60&10%
Boilers and Saucepans....40%

Enameled—

Agate and Granite Ware, list Jan. 1, 1889..33⅓&10%
Ironclad Enameled Ware....dis 33⅓&10%
} Extra 10% on some leading articles.

Kettles—

Galvanized Tea-Kettles—

Inch....	6	7	8	9
Each....	55¢	60¢	65¢	75¢

Standard Fiber—

	Per Doz. Plain.	Decorated.
Wash-Basins, 10½ in....	$1.80	2 00
Wash-Basins, 12 in....	2.00	2.50
Keelers, 11¾ in....		3.50
Cuspidors....		7.50
Spittoons, "Daisy," 8 in.	3.50	4.00
Peck Measure....	3.50	
Half-peck Measure....	3.00	

See also Pails.

Indurated Fiber.—

Spittoons No. 2, ₩ doz....$6.00
Basins, Ringed, ₩ doz., No. 2....2.80
Washtubs, Nested, Nos. 0, 1, 2 and 3 (4 pieces), ₩ nest....$5.75
Keelers Nested, Nos. 1, 2, 3 and 4 (4 pieces), ₩ nest....$2.55
Butter Bowls 15, 17 and 19-inch (3 pieces), ₩ nest....$1.50
Liquid Measures, pt., qt., 2 qt. and funnell (4 pieces), ₩ set....$1.20
See also Pails.

} Dis. 40&5%

Silver Plated, Hollow—

4 mo. or 5% cash in 30 days.
Reed & Barton....
Meriden Britannia Co....
Simpson, Hall, Miller & Co....
Rogers & Brother....
Hartford Silver Plate Co....
William Rogers Mfg. Co....
} 40&5%

Washers—

Size hole	5-16	⅜	½	⅝ to 1in
Washers	5½	4½	3¼	2¾

In lots less than 200 ℔, ₩ ℔, add ½¢, 5-℔ boxes 1¢ to list.

Washer Cutters—

See *Cutters, Washers.*

Water Coolers—

See *Coolers, Water.*

Wedges—

Iron....₩ ℔ 3½¢
Steel....₩ ℔ 8½¢

Weights, Sash—

Solid Eyes....₩ ton $18.00@$19.00

Well Buckets Galvanized—See *Buckets, Well, Galvanized.*

Wheels Well—

8 in., $2.00 10 in. $2.50 13 in $3.7

Whips

	Length.	4½	5	5½	6	6½	7	7½	8 ft.
X. L. Whalebone Driving		$18.00	20.00	22.00	24.00	27.00	30.00	33.00	36.00
Eureka, Two-thirds Whalebone		....	....	15.00	16.50	18.00	20.00	....	....
Bull Bone, Half-length Whalebone		....	....	11.00	12.00	13.00	15.00	....	....
American Standard		8.00	8.50	9.50	10.50	12.00	13.50	15.00	16.50
True Grip, Raw Hide Center		6.00	6.00	6.50	7.00	7.50	9.00	....	....
New Name, Stocked Java, Black and Wine Colors		....	....	....	6.00	....	....	....	....
Americus, 93 Pen Whip		....	....	....	6.00	....	....	....	....
Gents' Light Driving No. 111		....	....	....	6.00	....	....	....	....
Gents' Light Driving No. 106		....	....	....	5.00	....	....	....	....
Hand-made Stocked Java No. 103		....	....	3.75	4.00	....	....	....	....

Per dozen.

A large variety of cheaper grades.....50¢@$3.00
Team Whips.....$2.00@$7.50
Toy Whips.....
Hardware Assortment, 10/American, 75 Whips for $50.00. ₩ gro. $2.50@$12.00

Wire and Wire Goods—

Iron—

Market,

Br. & Ann., Nos. 0 to 18, 75&10@75&10&5%
Cop'd, Nos. 0 to 18, 75&5%
Galv., Nos. 0 to 18, 70&5@70&10%
Tin'd, Tin'd list, Nos. 0 to 18, 70@70&10%

Extra 5@10% often given and net prices often made on large lots.

Stone,
Br. and Ann'd, Nos. 16 to 18, 80%
Bright and Ann'd, Nos. 19 to 28, 80&5%
Br. and Ann'd, Nos. 27 to 36, 82½&5%
Tinned, 65&10%

Extra 10% often given.

Tinned Broom Wire, 18 to 21, ₩ lb....45¢
Galvanized Fence.....75&10%
Brass, list Jan. 18, 1884.....40&5%
Copper, list Jan. 18, 1884.....40@5%
Annealed Wire on Spools.....60%
Malin's An'aled & Tin'd on Spools..60&5%
Malin's Brass and Cop. on Spools...50&5%
Ossawan Mills, An'ld and Tinned on Spools.....60&10%
Ossawan Mills, Brass and Copper on Spools.....50&10%
Tate's Spooled, Tin'd & Annealed..60&5%
Tate's Spooled Cop. and Brass.....50%
Cast Steel Wire.....50%
Stubs' Steel Wire.....$6.00 to $, 30%
Steel Music Wire, 12 to 30, imported.....60@70¢ ₩ lb
Wire Clothes Line, see Lines.
Wire Picture Cord, see Cord.

Bright Wire Goods—
Standard list.....85@85&10%

Wire Cloth and Netting—
Painted Screen Cloth ₩ 100 ft. $1.75@$2.00
Galvanized Wire Netting.....75@75&10%

Wire Barb—
See Trade Report.

Wire Rope—See *Rope, Wire.*

Wrenches—
American Adjustable.....40%
Baxter's Adjustable "S".....40&10@50%
Baxter's Diagonal.....60%
Coes' Genuine.....50@50&10%
Coes' "Mechanics'".....50&10&3%
Girard Standard.....65&10@70%
Lamson & Sessions' Engineers'....60&10%
Lamson & Sessions' Standard.....70&10%
P. S. & W. Agricultural.....
Girard Agricultural.....
Lamson & Sessions' Agric'l..
W. & B. Diamond.....
75&10@80%

Bemis & Call's.
Pat. Combination Bright.....40&5%
Pat. Combination Black.....40 & 10%
Merrick's Pattern.....45%
Brigg's Pattern.....30&10%
Cylinder or Gas Pipe.....45&5%
No. 3 Pipe.....55%
Aiken's Pocket (Bright).....$6.00, 50&10%
The Favorite Pocket.....₩ doz., $4.00, 40%
Webster's Pat. Combination.....35%
Boardman's.....30%
Always Ready.....25&5%
Alligator.....50%
Donohue's Engineer.....20&10%
Eagle.....50&10%
Acme, Bright.....50&2%
Acme, Nickeled.....40&2%
Hercules.....70@70&5%
Walker's.....55&5%
Diamond Steel.....55&5%
Cincinnati Brace Wrenches.....25&10%
Tafts Vise Wrench.....55&10&2%

Wringers, Clothes—

Am. Wringer Co.'s list, July 1, '93..2% cash
Colby WringerCo., list Sept. 1, '91..2% cash
Lovell Mfg. Co., list July 1, 1892..2% cash
Peerless Mfg. Co., list Feb., 1892..2% cash
National Wringer & Mfg. Co., list June 1, 1892.....2% Cash

Wrought Goods—
Staples, Hooks, &c., list March 17, 1893 85&10@85&15

News and Notes.

The elevators and storehouses of New York are congested with wheat awaiting transportation abroad. The low cargo rates prevailing have led to few offerings by the steamship companies, and as a result every available storage building has been taxed to its utmost by the influx of grain from the West and even a great number of canal boats have been unable to unload their cargoes.

There were 887 business failures in the Canadian Dominion during the first half of this year, according to *Bradstreet's*. The liabilities aggregated $8,215,759, against $3,880,236 of assets. As compared with the same period of 1892, this represents a falling off in number of 7 per cent. and an increase of about 14 per cent. in liabilities.

The United States Consul at Batoum, on the Black Sea, has made an interesting report on the development of the petroleum oil trade at Baku, on the Caspian Sea. The general conclusion arrived at is that, in spite of the immense supply of oil, the increasing demand may exhaust it. The daily yield of crude oil in 1885 was 38,000 barrels, and in 1892 it had increased to 110,000 barrels, while during the month of May it ran up to 137,000 barrels per day.

The French War Office has had submitted to it an electric gun alleged to be capable of discharging 25,000 projectiles in five minutes and to have a range of several miles.

Letters from Caracas to merchants in the South American trade indicate that Venezuela is at last at peace. It is stated that President Crespo has submitted to the new parliament a proclamation pardoning all those who fought against him. The act has been approved and all natives of the country can now safely return.

The American Society of Civil Engineers has issued a reference map of the United States for the convenience of visiting foreign engineers. It contains an extensive list of public works and manufactories which are open to their inspection, the map and lists having been prepared by the Committee of Information and Courtesy, of which Edward P. North, Leffert L. Buck and Foster Crowell are the members

In the United States Circuit Court at Pittsburgh last week opinions were handed down in two suits for infringement of patents. One case was that of the Duff Mfg. Company against William Forgie, and the other that of William Forgie against the Duff Mfg. Company and the Oil Well Supply Company. The first suit was on a jacking mechanism for screwing and unscrewing oil-well tools, which is covered by three patents held by the plaintiff. The court held several of the claims in two of the plaintiffs' patents had been infringed by the devices used by the defendant, and a decree against him was directed to be drawn. In the other case on other devices, for which Forgie claimed to have patents, the court held his patent is invalidated because of the non patentability of the device. Judgment for the defendant was therefore given.

A splendid system of electric buoys has been inaugurated by the Lighthouse Board for lighting the lake front between Chicago harbor and the World's Fair grounds. This system of lighting might be advantageously introduced in other inland waterways.

The London & Northwestern Railway Company have begun an experiment in running what they term "corridor trains," which correspond with our vestibule trains, on their line between London and Edinburgh. In constructing the cars for this new train an effort has been made to combine the conveniences of the American system with those conditions of semi privacy that are considered desirable in English railway carriages. The cars, both first-class and third-class —for the second-class cars have been discontinued—are built with a corridor running along the left or platform side of the carriage, instead of having a central passageway, as is usual in American trains. The space not occupied by the corridor is divided into compartments in the usual way, each compartment affording accommodations for four passengers. The passage from one car to another is effected by an arrangement which resembles our vestibule device, except that the covering is of stout india rubber, fitted to metal frames.

A successful trial has been made on Long Island of an underground electric railway system, for which claims of advantage over the usual trolley system are made.

The new Walnut street bridge, Philadelphia has been opened to the public. The bridge has been in course of construction since June, 1889. Its erection was authorized and an appropriation of $200,000 to begin the work was made on December 24, 1888. Work was not commenced on the piers, however, until September 20, 1889, when the contractors began the eastern one. On November 9 this was carried away by a freshet. Work was then begun on the western pier. Considerable difficulty was met with in constructing the piers on account of the depth of water. The four piers were finally constructed, however, at a cost of $120,000. There are three spans over the river 123 feet long. The total cost of the structure was $741,418 64.

One important result of the armor-plate tests made at Indian Head last week will be to extend the use of the Harvey process. The tests were satisfactory as far as they went, but the Secretary of the Navy is reported to have reached the conclusion that, while the plates were as good as could be expected from plain nickel steel, they did not show the resisting power of Harveyized nickel-steel plate. This will mean much to the manufacturers of armor plate. The contracts under which the plates are made permits certain pieces to be made of plain nickel steel. The reason for this is that the Harvey process is very difficult of application to curved plates or pieces of irregular form. Such pieces are very apt to warp when submitted to the process, and as they emerge with a surface almost as hard as a diamond it is said by the plate makers to be next to impossible to do anything with them in the way of manipulation. The warping frequently throws the bolt holes out of line and distorts such pieces as the sponsons, the semi-cylindrical pieces that protect the guns on the side of a ship, so that they will not fit, and the work of adjustment is very difficult and tedious, as few tools can be made to cut the hardened plates.

It is stated that franchises are being gradually secured with the ultimate object of connecting Philadelphia and Newark, N. J., by trolley railway lines.

The London *Times*, following what has become its usual practice, has published an exhaustive review of the acreage and condition of crops in Great Britain, based upon replies to special inquiries addressed to all sections of the country. A decreased acreage is shown for wheat and barley, but oats, potatoes, beans, peas, roots, grass and hops all show increases. Speaking of the unpromising conditions, the *Times* says that if the farmers are to escape actual ruin some unforeseen and fortunate circumstances must arise.

Boston advertises for bids for the construction of a dam across the valley of Stony Brook. This will make a basin holding 7,500,000,000 gallons. The work must be finished by November 1, 1896.

THE METAL WORKER.

NEW YORK AND CHICAGO.

Saturday, July 29, 1893.

DAVID WILLIAMS, - PUBLISHER

BUSINESS OFFICES:

NEW YORK.....96-102 Reade Street.
PHILADELPHIA.....220 South Fourth Street.
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CHICAGO.....59 Dearborn Street, cor. Randolph.
CINCINNATI.....Rooms 22-24 Pickering Building.
ST. LOUIS.....Bank of Commerce Building.
CLEVELAND.....312 The Cuyahoga.

BRITISH AGENCY: The Ironmonger, 42 Cannon street, London, England.

Announcement.

The publication of *Metal* by the Kittredge Company, 78 Reade street, New York City, has ceased, and the journal has been incorporated with *The Metal Worker*. Unexpired subscriptions to *Metal* will be filled by *The Metal Worker* for the time for which payment has been made.

The acquisition of this journal will in no way affect the policy or conduct of *The Metal Worker*, which will continue to be published in the interests of the several classes to which it is addressed. The practical features of the paper will be increased wherever and whenever possible, and the news of the trades will be fully presented. It is not proposed to change the standard of the paper in any way, except to improve it whenever occasion offers. With this purpose in view, the co-operation of the readers of *The Metal Worker* is cordially invited, and it is desired that they continue to write freely when they are seeking information or have anything of interest to tell the trade.

Photographing Plant Growth.

Photography has in many ways been serviceable to modern science. In almost every branch of physical research its aid has been called in to record facts, phases and discoveries, the impression of which, often of an evanescent nature, could not by any other means be caught and permanently retained in evidence. Fresh applications of this valuable art are being continually reported. The camera's aid has brought to knowledge, in combination with the refracting telescope, stars and heavenly bodies not visible to the human eye even when assisted by the most powerful instruments. Muybridge has succeeded in obtaining that most wonderful series of photographs of the movements of the horse, which has taught artists and naturalists more about animal locomotion than they ever dreamt of before. Only recently we read that the characteristic walk of certain insects had been absolutely defined by photography. Similarly the camera has accurately registered the movements of a bird's wing in flight. Even the play of the lightning flash has been followed and recorded. There seems to be practically no limit to the usefulness of photography in the arts and sciences. Its latest development, as noted in an exchange, is the application of photography to record the movements of the growing parts of plants, by which some curious results have been obtained. In the case of the hop convolvulus, the movements of the young stems were found to consist of a succession of irregular circular or elliptical curves, which vary every moment, even in their direction. These movements are caused by unequal growth in different parts of the stem. It was also discovered that even when asleep plants move, not, as was formerly supposed, interruptedly, but continuously. Further interesting disclosures will probably be made in this field by the help of the camera.

Summer Ventilation.

At no time in all the year is ventilation more ardently sought than in this time of thin clothes and cooling beverages. And yet it is not ventilation in its true sense that is always sought. Comfort to the ordinary man comes rather from an appreciative movement of the air than from a mere preservation of its quality without drafts. The palm leaf, as well as the whirring electric fan emphasize this most strongly. And yet what we really require is an atmosphere cooler than that in which we are suffering. This can seldom be obtained except by expensive appliances. The supply of large air volumes by means of a fan meets the requirement only in so far as quantity is concerned, but quality, as necessary to the desired result, must be measured by a lower temperature, and, even more important, by an atmosphere that is dry enough to readily absorb the moisture emitted by the skin, but still not so dry as to have the least effect of parching. The great difficulty with most cooling devices is that either cold water or ice is employed, the air being brought intimately in contact with it and thereby charged with moisture. At the same time the temperature of the air is reduced and hence its own relative humidity increased. This latter is likewise true of air cooled by contact with refrigerating pipes. It has been suggested that the air, prior to its cooling, might be passed across trays of calcium chloride, which is a greedy absorbent of moisture, and thereby be dried to such an extent as to make it possible to cool it to the desired degree without objectionably raising its relative humidity.

Salary vs. Opportunity.

Too frequently the young man seeks first and most earnestly for a paying position. It is too much a matter of a bird in the hand being worth two in the bush. But the day comes when the young man, now older grown, finds that he has practically reached the limit of his opportunity with the person or concern by whom he has been employed. The boy who settles down to learn a trade, although his first few years may be years of hardship and deprivation, will, with persistence, reach and surpass his rival who has taken a position which is limited in its possibilities, or which is such as to give him no valuable fitting for a position elsewhere.

Too Small Capital.

With the recurrence of hard times and the multiplication of failures on every hand, a great deal is heard of the good effects that will be accomplished through the permanent retirement of those who have been trying to do business on too little capital. This is a theme which is dwelt on in every circle, and the small merchant, whose utmost credit is measured by hundreds, applies the criticism as glibly to his weak competitors as does the millionaire operator to his weaker rivals. It is recognized that every line of trade has in it a number of weak concerns that even in good times are tottering on the verge of bankruptcy, because of too great an extension for the capital invested. And men argue that if only these lame ducks could be driven out of business everybody else would have a much better opportunity. Prices would be more stable, because there would be no one making occasional forced sales to raise money or offering inducements of an exceptional character to increase trade.

Forced Sales.

Proceeding upon this line of argument, men are apt to draw distinctions and term some business houses illegitimate or irregular. They are thus characterized solely because they do not have sufficient capital to conduct their operations in the conservative, staid, dignified manner peculiar to con-

cerns with unlimited bank accounts or unlimited credit. They are obliged to make a raid on the market when a little pinch comes, and cut prices so as to make a line of goods move quickly and bring in the requisite cash. They are apt to break out most unexpectedly and of course always most disadvantageously for their competitors who would encourage stability and deplore distressing fluctuations. The hardware and kindred trades do not suffer much from "fire sales" and from "misfits," it is true, but there are equally annoying circumstances to vex the sturdy merchant who discounts his bills and expects all his customers to do the same.

Cheap Credit.

Credit has perhaps been too cheap in the recent past. The point had almost been reached when a man could go into business with no capital whatever and obtain credit at a dozen different sources of supply. He could certainly command a credit of several times his cash resources. Every creditor knew that he was buying from others at the same time greatly in excess of his capital, and yet there was no protest at the great expansion in business thus promoted. Orders had to be obtained, because small margins made it necessary to do a large business, and the dance went on. Sometimes the banks were imposed upon by this class of people representing themselves to be exclusive customers, slipping in back doors, because they did not want it known that they were borrowers of money, yet using every bank in their vicinity in the same way until the bubble grew too big and finally burst. These are the people that straightforward business men would be glad to see permanently retired. Many of them have been relegated to the commercial graveyard already, and others will follow as the monetary pinch retains its hold. Unfortunately, these people do not go alone, but take company with them worthy of a better fate.

Cash Business.

Out of these tight times we will emerge presently on a much better basis. Business will be done more largely for cash. Credits will be very carefully scrutinized. It will not be an easy matter for a merchant to buy goods to the full amount of his capital from a dozen different houses and trust to good luck to pull through. That time will come only after the country has enjoyed a long season of prosperity again and forgotten all about the panic of '93. Meantime energetic men of small means will find it much harder to get a start in the world than from '80 to '90. It will not do to refuse credit to all of them, establishing a cast-iron rule on the subject, as that would kill all enterprise and prevent perhaps most capable business men from getting a good foothold in the great struggle for supremacy.

Indianapolis, Ind., has adopted the plan of cremating her city garbage.

In Memoriam.

The following letter from ex-Senator Dawes of Massachusetts has been furnished us for publication. Mr. Dawes, who knew Colonel Auchmuty in his country home at Lenox, tells how he was always working for the good of others and did not limit his benefactions to his cherished trades school.

PITTSFIELD, MASS., July 25, 1893.

I am very glad to comply with your request, and avail myself of the opportunity to bear testimony to the great work and worth of the late Colonel Auchmuty. Although his summer home here in the country is many miles from the noble work to which he devoted so much of his time and money, yet we here saw in our daily intercourse with him what manner of man he was, and were made acquainted with those traits of character out of which came the trades school of New York and the many other benevolent enterprises which he had so much at heart. He brought with him here—indeed, he carried with him everywhere—a great heart, an earnest zeal to do something that would help those around him to the opportunity, to the desire and to the ability to better their own condition. It was along this line that his interest lay—to help men to help themselves. He was, above all, a public spirited man, and identified himself with every undertaking tending to the improvement of his city and town, as he had given himself in the past to the nation in its time of need. We saw much of that spirit in his work at Lenox, where he devoted much time to promoting and superintending works for the improvement of that town. Much of the liberal and public-spirited effort which has made it not only beautiful and attractive, but safe and wholesome as well, by means of its roads, its water supply and sewerage, and other permanent improvements, is due to the inspiration, personal effort and example of Colonel Auchmuty, one of the first among the summer comers and earliest among those who set about doing the best possible thing for Lenox. There is not a charity or other good work in that town which will not feel his loss, and especially will this be true of the publicschools.

We knew little of the methods of the trades school founded by him in New York, but we knew of the good it was doing. Boys from the vicinity of his home here have been the recipients of its benefits, and have come back equipped for a useful life and resolved on its accomplishment. Colonel Auchmuty impressed those with whom he came in contact with the feeling that the endeavor of his life was to lift—to lift those who needed a lift in whatever way opened. The needy and the worker alike have lost a most efficient helper, those who have money and a heart to use it for their fellows, a most worthy example, and the community in which he lived a most estimable citizen.

He won the regard of all, and the lasting gratitude of many a useful and valuable citizen who but for him would have gone through life, if not a positive curse to society, a helpless and useless incumbrance. He will be missed and mourned by all who knew him.

H. L. DAWES.

We print below a letter from Harry Brill, who is well known to the graduates of the New York Trades School, and who, from his intimate acquaintance with Colonel Auchmuty and his work, understood better than others the relationship he held toward the students:

NEW YORK, July 25, 1893.

In the death of Col. R. T. Auchmuty an inestimable loss has been sustained, not only by the school with which his honored name will always be associated as its founder and sustainer, but also in educational circles where his thorough knowledge and familiarity with the subject of instruction in the mechanical trades was of incalculable value, and greater than all will his loss be felt by the army of young men whose welfare he constantly sought to promote.

In the many tributes to his memory that have recently appeared, extended reference has been made to his life and to the trades school he built, to his high character, noble purposes and benevolence; but only to those most intimate with him was the absorbing interest he took in young men familiar.

Nothing afforded him greater pleasure than to personally be among the students, observing their progress, speaking words of sympathetic encouragement, imparting kindly advice and endeavoring to make brighter the trying road each was traveling in his efforts to acquire a trade that would insure an honorable livelihood. On frequent occasions a student, becoming disheartened for the moment at not immediately attaining success in some difficult piece of work, obtained renewed determination not to fail through the influence his presence exerted.

That the young men appreciated the fatherly interest he took in their life is attested by the enthusiasm with which he was always greeted and by the innumerable letters received by him from those who have attended the school.

A few years ago, in an address made in Philadelphia, he said: "I propose to devote the remaining years of my life to the American boys." How faithfully and unselfishly he has done so is too well known to need repetition.

Although Colonel Auchmuty has passed away, the institution which he leaves will continue to shed its usefulness in the future as it has done in the past.

HARRY BRILL.

From Edward Murphy, a master plumber, widely known throughout the country and who has taken much interest in the New York Trades School, we have the following appreciative letter:

NEW YORK, July 26, 1893.

A subdued and hushed air hung over the village of Lenox, amid the Berkshire hills in Western Massachusetts, as the simple funeral cortege conveying the remains of the late Colonel Auchmuty wound its way down the mountain road from his residence to the church where the final rites were performed.

The stately edifice, which stands as an enduring monument of his architectural skill as well as of the munificence of himself and Mrs. Auchmuty, was filled with his relatives, friends and the residents of the neighborhood. The simple and impressive services occupied all too short a time, and on the invitation of the Rev. Dr. Huntington, one of the officiating clergymen, the entire assemblage followed the funeral to the ancient cemetery where so many of the forefathers of the village hamlet sleep.

The last sad tribute of reverence and affection was paid on a grassy slope of the hill side facing the west, the rays of the setting sun gilding his resting

place, and the thought involuntarily came into the mind how fitting and peaceful was the close of the earthly career of one of the noblest and most self-sacrificing men of his generation. A man of large means, cultivated tastes and historic record, he identified himself with a new departure in the history of the world's well-doing. For many years he devoted himself heart and soul to a cause that appealed intensely to his sense of justice and patriotism. He saw the young men of his native land debarred by senseless and galling restrictions from their natural opportunities of acquiring the knowledge of various trades and unhesitatingly he resolved to right this wrong as far as in him lay. With infinite pains and assiduity he elaborated and carried into effect his plans for a school where the more important of the building trades could be taught. The difficulties he met with and the discouraging opposition that beset the pathway not alone of him, but of all who run counter to the antique prejudices of average humanity, is known but to his intimate friends.

It is one of the tritest of sayings that nothing succeeds like success, and of those now ready to applaud the splendid results and untiring efforts as evidenced in the work of the well-known New York Trades School, could but realize the time, thought and expense involved, they would be amazed at the magnitude of the undertaking. And all this was done without parade, without notoriety seeking or appealing for outside aid, and it is within the bounds of strict truth to say that as an individual enterprise the school is to-day unparalleled in the world's history.

And now a word as to the future. As recently organized under a board of trustees, whose names are synonymous for executive ability, intelligence and wealth, it would be difficult to set a limit to the progress and development that may be expected hereafter. While the changes thus made conduce immensely to the success of the school, it may be well to say that in any event ample provision was made for its continuation on the lines already laid down by Colonel Auchmuty, for, as he declared on more than one occasion, it was his purpose and determination that, no matter what happened, his life-work should not die with him, but should be perpetuated for all time.

EDWARD MURPHY.

Natural Gas.

BY L. M. W.

It is generally known that natural gas gushes up out of the well and doesn't have to be pumped out, but only a vague idea exists as to the force with which it comes. The highest pressure reported was found in a Canada well, which was calculated at 700 pounds to the inch. A few have been found in the Pittsburgh district that have run up to 500 pounds, while a pressure of from 300 pounds up to 350 pounds is not uncommon. At a manufacturing plant at Gas City, Ind., that had not yet got the boiler in operation, a gas-pipe was connected with a pumping engine instead of the steam pipe, and no difficulty was experienced in pumping water from a well 280 feet deep. In using the gas for fuel it has been found necessary to use pressure regulators to reduce the pressure to about 8 ounces, which seems to be most satisfactory. One ounce or an ounce and a quarter is about the usual pressure found in the artificial gas manufacturing plants of the average city. In many sections where there is an abundance of natural gas, the right to bore for gas is leased by a syndicate from the owners for all promising land near a given center, where, as an inducement for manufacturers to locate, a plot is given and gas furnished for fuel free of charge. As a result economy of consumption or perfection in combustion is given little consideration and leaks and wastes impart a perceptible odor to the atmosphere. In some cases a blower is used to force air into a mixing chamber with the gas to secure a clean flame and a high temperature.

In the tin-plate plants workmen who have formerly used coal are quite enthusiastic over natural gas. It supplies an even temperature, never making the plates too hot or too cold (to demand extra work or loss of time) and there is no replenishing of fuel or stoking necessary, consequently more work and wages result.

For light forging an oven or furnace, built of brick, is used for heating the iron or steel. The ovens are of various sizes, set on iron legs of convenient hight, and consist of two thicknesses of brick on the bottom and on the top. One in mind had side walls about 14 inches high on the outside and was 24 x 36 inches in size, with an opening 4 inches high across one side, through which the material was inserted. On looking inside no flame was apparent, but a bright red heat was clearly perceptible and the blacksmith had no difficulty in shaping his work when placed on the anvil.

In the brass foundry a flame encircles the crucible and frequent heats can be readily made.

Plumbago Foundry Facings.

The Joseph Dixon Crucible Company of Jersey City, N. J., have issued the following interesting statement: In considering the subject of foundry facings the art of molding may be divided into three classes — viz.: 1. Green sand. 2. Dry sand or loam. 3. Flat or "print-back" molding. Such a division answers to the three general methods in which facings are applied.

But in different shops different conditions exist and different methods are followed, and because of their differences we are often unable, through our ignorance of them, to correctly fill orders that come to us.

For your better information we give a short description of the three methods of mold-making and using of facings.

1. In green sand molding, the sand (slightly damp, just enough so to pack and retain the form of the pattern) is rammed around the pattern, the pattern is removed and the facing is applied. This is done either by shaking the facing through a bag or by being put on with a brush, to insure its even distribution over the surface of the mold. It is then rubbed by the hand or by the use of a "sleeking" tool. This insures the adherence of the facing to the moist sand so that it will not run or become loosened, as the molten iron runs across it.

This method of making molds is used more than any of the others and is used in all general machine shop work, except where the castings are very heavy.

2. The dry sand or loam molding is employed. In this branch of work, dry sand—that is, sand that has previously been used in the same kind of work, is mixed with fresh loam, and after the molds are made they are baked by placing them in an oven if small, or by building a fire inside the mold if they are large. Such a mold is hard and firm and the surfaces are porous in texture and afford a fine support for the facing, which is applied in the form of a wash or paste. The usual sleeking follows, to insure perfectly smooth surfaces on the casting. This method is followed where the work is heavy—such as engine and planer beds, engine cylinders, large gear wheels, &c.

3. Flat or "print-back" molding is the method employed where the articles to be cast are light and ornamental in character—such as stove plate, grate fronts, castings and iron fences, &c. In this case the molds are made the same as in green-sand molding, and the facing is applied through a shake bag, but instead of smoothing the facing by the hand or tool, the pattern itself is pressed back into the mold, and in this way the facing is made to stick to the sand and also to correspond exactly to the surface of the pattern. Whatever loose facing may be left in the mold is blown out by the bellows and the mold is finished.

With this information in your mind, you are expected to put yourself in possession of such other information as will enable you to answer the following questions when sending in an order for facings:

1. What articles does the molder make?

2. (*a*) Which of the three methods are followed?

(*b*) If more than one method is used, for which method is the particular facing of this order to be used?

3. (*a*) If for green sand molding, is the facing to be applied through a shake bag or by a brush?

(*b*) Is the facing "sleeked" by the hand or by a tool?

(*c*) Are the castings heavy or light (that is, is the total surface of the casting small or great as compared with the weight)? This is important. A block 1 foot each way weighs the same as a plate 4 feet long by 3 feet wide by 1 inch thick. But the block has but 6 square feet of facing surface, while the plate has more than 25 feet. You wil see at once how differently the first cast ing would effect a facing.

(*d*) Does the foundryman consider that he uses his sand wet, dry or medium? Be sharp on this point, so that you may be able to judge for yourself. One man's "dry" sand may be another man's "wet" sand. By feeling of the sand in every shop you go into you will soon be able to judge on this point better than any molder in any shop.

(*e*) Do they have any trouble from the facing running before the iron?

4. If for dry sand loam molding, is any charcoal added to the facing by the molder himself?

5. If for flat molding, is charcoal used in connection with the facing, and if so, is it dusted on separately or mixed with the facing before using?

6. Are there any troubles in the conditions or practices of the shop that might bother the facing, and have there been any difficulties experienced in the use of his molding sand.

Nearly $9,000,000 were expended in Washington, D. C., during the year ending June 30, 1893, in building operations. The new houses put up within that period were 2720. This number would have been much larger but for the law recently passed which practically forbids houses being built in alleys in the national capital.

TIN PLATES.

What Is Tin Plate?

BY L. M. W.

On listening to the queries of the sightseer at the tin-plate exhibit at the World's Fair the lack of information and acquaintance with the features of tin-plate manufacture becomes conspicuous. The general but incorrect impression is that a secret and wonderful skill is required to plate the black sheets. In fact, in many cases, this all-important essential is a seemingly new thing to the inquirer. In the production of the black sheet from 80 to 90 cents is expended of every dollar spent in making tin plate. On the toughness of the fiber depends the value for working. On the even thickness depends its desirability and value for various purposes. On its surface depends the amount of material used and the ease of coating it. With the black sheets possessing all of these desirable features the coating is by no means a serious condition to meet and is readily overcome, as is shown by the 10 to 20 cents of the dollar which pays for both the pig tin and the labor. For some reason it is not generally known that the English tin-plate makers are just as far from the mines where they get their supply of pig tin as we are, and that the tin mined on the British Isles is not suitable for use in coating plates. We have lead at home for making terne plates, and have that advantage. The price of tin plate will always be sympathetic with the price of sheet iron, and not with pig tin, to so great an extent. The puddler and rolling-mill man, rather than the miner, will always exert the more potent influence on the tin-plate market. This does not seem to be the public opinion, but just think it over and the truth will become manifest.

Tin Plates for Cuba.

A Washington dispatch records the discovery that British tin plates have been lately introduced in considerable quantities into Cuba, free of duty, under the reciprocity treaty recently entered into between that island and the United States. It was found that a wonderfully large trade in tin plates had recently developed with America, while there has been at the same time a remarkable falling off of receipts from duties on English plates at Havana. Upon investigation by the Spanish authorities, it was found that large British shipments of tin plates and tin-plate hardware have been unloaded in the United States, marked "in transit," and that these goods, supplied in some way by the necessary certificates, manage systematically to get into Cuba, under cloak of the reciprocity treaty, without paying the duties which Spain exacts from all English imports. The Spanish Government has sent complaints to London and Washington, and the three governments are said to be now making efforts to stop the leak in the Havana customs receipts, to restore direct British trade, and to prevent the reciprocity treaty from covering fraud.

SCRAP.

A. A. THOMSON & Co., New York, are installing an additional tinning machine at their tin-plate works, which will increase their output 50 per cent. Messrs. Thomson report a very satisfactory demand for their product of roofing plates, which insures the sale of all they can put out, running their works to full capacity.

THE TERNE PLATES for roofing the new pier building for the Inman Company at the foot of Fulton street, New York City, were supplied by the N. & G. Taylor Company, Philadelphia. The pier, which is 650 feet long and 130 feet wide, will be the finest structure of its class in the North river and one of the finest in the country. Taylor Old Style, 1C, 20 x 28, is the plate used. The roofing is being carried out by Jacob Ringle & Son, roofers, of Jersey City.

THE HARRISBURG, PA., SHEET MILL of the Lalance and Grosjean Mfg. Company was lately shut down for three weeks, owing to lack of water. This defect has been remedied by the connection of the works with the city water system and the mill is again in full operation. The company report a large demand for their black sheets for tinning purposes. All the material that they do not consume at their Woodhaven factory is readily bought by the American tin-plate manufacturers.

BRITISH EXPORTS of tin-plates and sheets to the United States during the month of June were 26,759 tons, against 23,550 tons in the corresponding month of 1892.

P. W. SPENCE & CO'S CIRCULAR, dated London, July 11, has the following report on the British tin-plate trade for the first half of this year: "Tin plates receded still further during the half year, and now are at the lowest figures ever known in the history of the trade. This fall was caused by the reaction in the price of tin, following upon the silver crisis, and the slow demand experienced from the United States. The trade is undoubtedly very unprofitable to the makers, and any stoppage of production could not fail to affect prices. There is still great uncertainty as to when the McKinley tariff will be amended; but the American authorities have at last discovered that the quantity of tin plates made from native iron is very small, and that the great bulk of the so-called American tin plates are being made from English black plate. Exports of tin plates (January 1 to June 30):

	1893. Tons.	1892. Tons.	1891. Tons.
To United States	160,420	143,021	263,225
To Russia	15,273	15,781	11,818
To other countries	41,874	47,975	31,163
Totals	217,567	206,777	306,206"

JOHN HAMILTON, Pittsburgh, Pa., manufacturer of the well-known Hamilton best re-dipped American roofing plate, is receiving the hearty congratulations of his friends and the trade generally on the occasion of his marriage, which took place on Thursday, the 27th inst. The happy couple are now enjoying a tour of the Eastern watering places, and before returning to their future home at Bellevue, Pa., will make an extensive visit to the World's Fair. The warmest congratulations of *The Metal Worker* are extended.

LATEST ADVICES from England report business as still dull in the tin-plate trade, the principal inquiries being from Russian and San Francisco dealers. American business moving slowly, and orders below the average. Manufacturers are reluctant to book orders at present prices, and the market is reported as firmer at the iron masters' quarterly meeting held in Birmingham, the week before last. Some large shipments, amounting to 122,797 boxes, had been made from Swansea.

IMPORTS OF TIN into Great Britain during the first half of this year were 339,456 hundredweight, against 274,957 hundredweight in 1892, and 337,836 in 1891. The value of pig tin received was $7,484,098. Of this amount 607 hundredweight was shipped again to the United States.

THE STRIKE at the Carmarthen Tin-plate Works, Carmarthen, Wales, is reported as raised and work has been resumed after a stoppage of nine weeks. Mutual concessions were made by employers and employed in the matters under dispute. The struggle was carried on with the greatest good feeling on both sides. Gilbertson's Pontardawe tin-house men are still out on strike.

N. & G. TAYLOR COMPANY continue to make a good showing at their tin-plate works in Philadelphia. The following figures, furnished by the firm exhibit their output of tin and terne plates for the six months ending June 30:

	Net weight. Pounds.
Tin plates lighter than 50 pounds per 100 square feet	1,190,738
Tin plates weighing 50 pounds per 100 squre feet	691,226
Tin plates weighing 62½ pounds per 100 square feet	105,117
Tin plates weighing 63 pounds per 100 square feet and heaver	503,301
Terne plates lighter than 50 pounds per 100 square feet	1,753,383
Terne plates weighing 50 pounds per 100 square feet	1,656,946½
Terne plates weighing 62½ pounds per 100 square feet	54,641
Terne plates weighing 63 pounds per 100 square feet and heavier	333,902½
Total	6,289,255

VALUABLE TESTIMONY is constantly coming to hand respecting the quality of American tin plate. Among the warmest advocates of the new material are country tinsmiths, who have put it to test with satisfactory results. Not long ago in conversation with a dealer in the country districts he announced that he ordered American tin plate every time, and in the cheaper grades he considered them far ahead of the imported article. There was not, however, so much difference in the higher-priced plates.

A BRIGHT, smiling young man and one who is popular with the tinners and consumers of solder, tin plate and registers is J. Rudderow, though 22 years have been passed in attending their wants in the service of Hall & Carpenter of Philadelphia.

IN RESPECT of the tin-mining industry of the Black Hills in South Dakota, the *Hill City Tin Miner* observes as follows: "It may perhaps not be generally believed, owing to certain recent unaccountably peculiar workings of the parties principally in interest, that there are in the southern hills extensive bodies of tin ore which can and will, perhaps sometime in the dim future, be profitably mined and worked; but such is nevertheless the case, and these bodies of ore do not by any means all belong to corporation capital. While possibly a long time may elapse and larger capital be required in the development of these mines than in those of the gold belt, it is none the less true that, despite the reasonable doubt of their existence on the part of the investing public, they are good property to own."

TIN-PLATE IMPORTATIONS for the first four months of this year were 90,770 gross tons. This shows a falling off of 3398 tons from the figures for the corresponding period of 1892; while consumption has increased.

TIN PLATE in transit from Great Britain to West Indies, Central and South American ports, via New York, amounted to but 1680 pounds for June, 1893.

Sealed proposals will be received at the office of the Supervising Architect, Washington, D. C., until August 9, for all the labor and materials required for the excavation, concrete foundations, cut stone and brick work, iron and wood floor, ceiling and roof construction, roof covering, drainage, approaches, &c., for the United States post office building at Staunton, Va., in accordance with the drawings and specification, copies of which may be had at the office of the Supervising Architect, Washington, or from the superintendent, at Staunton, Va.

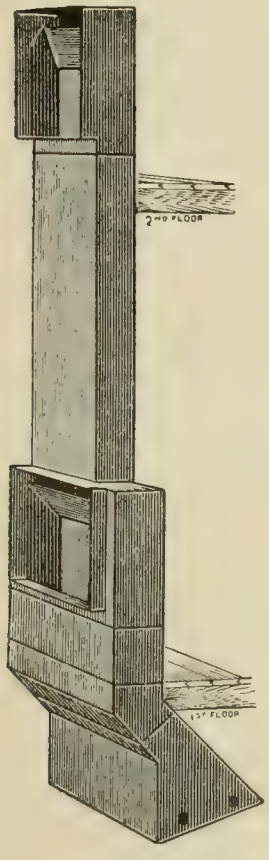


Fig. 1.—Stack of Novelty Ventilated Wall Pipe.

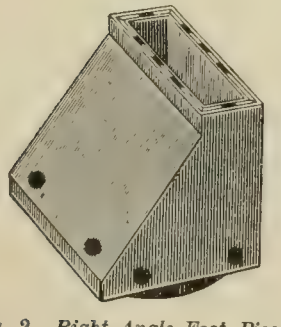


Fig. 2.—Right Angle Foot Piece.

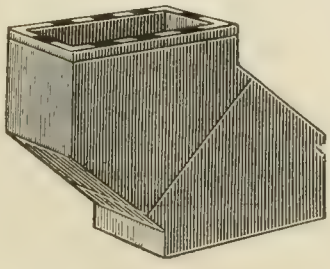


Fig. 3.—Two 45° Edgeway Ells.

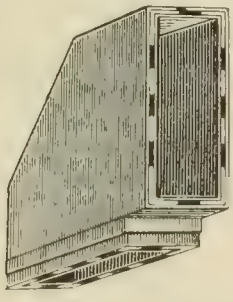


Fig. 4.—Right Angle One-Piece Edgeway Ell.

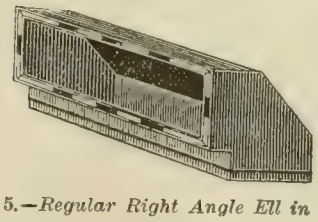


Fig. 5.—Regular Right Angle Ell in One Piece.

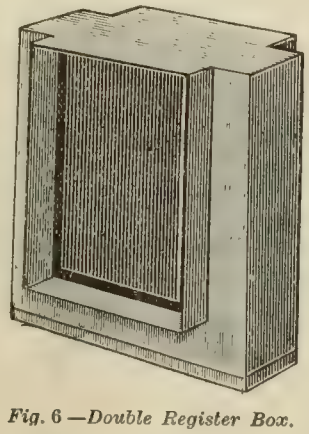


Fig. 6.—Double Register Box.

NOVELTY VENTILATED WALL PIPE.

Patents have recently been granted John P. Schaffer, 18 Wood street, Pittsburgh, Pa., for a new ventilated wall pipe or hot air flue, which he is putting on the market under the name of the Novelty. It is intended for use in the partitions of houses that are to be heated with hot air. It consists of an inner and an outer pipe, with an air space between them to insure safety and guard against the loss of heat. Selected bright tin is used, and the pipe is furnished in lengths of 8 feet with a complete line of fittings to facilitate its erection in a building. Shorter lengths are furnished when ordered, but a feature of the pipe is the ease of adjusting the lengths to the requirements. A slip socket connection fits on the ends of the pipe and is readily removed to permit the shortening and easily replaced to complete the pipe. It is stated that this work can be done with facility at the building where the pipe is being erected, while the long lengths securely double seamed together effect an appreciable saving of time and labor. Fig. 1 shows a 45° foot piece to receive the pipe from the furnace connecting with a 45° ell, making an offset to clear a timber, then connecting with a short piece of pipe with a register box, from the top of which a smaller size of pipe runs to a room above. Fig. 2 shows a right angle foot piece. Fig. 3 is two 45° edgeway ells for making either a right or left offset, or a right angle ell. Fig. 4 is a right angle edgeway ell in one piece. Fig. 5 is a regular right angle ell in one piece, and Fig. 6 is a double register box. The ease with which these fittings connect and the varied requirements they meet has, we understand, been satisfactorily demonstrated in some of the fine residences in Pittsburgh during the past winter. Being made of special sizes of tin and by machinery there is no waste of material. In sizes the inside or air-carrying pipes are 3 x 7¼, 3 x 9¼, 3 x 11¼, 3 x 13¼, 4¼ x 11¼, 4¼ x 13¼ and 11¼ x 11¼, with all of the various fittings for each size. The outside pipe is ¾ inch larger in dimension, and the air space is made to connect from the base of the pipe to the register.

The *Mineral Water Review* gives the following reasons why tinned vessels exposed to the action of mineral waters are apt to rust: "Pure tin is not affected at ordinary temperatures, but as soon as a portion of the tin is removed by injury so as to expose even a tiny speck of iron surface, corrosion at once sets in and proceeds very rapidly. The reason of this is of an electrical nature—that is, iron and tin together form what is called a "galvanic couple," which will decompose the water charged with carbonic acid deposited upon them from the air; oxygen and hydrogen gases are liberated, and the iron, having the greater affinity for the oxygen, is the metal attacked, in particular, such corrosion is very rapid when the exposed iron surface comes in contact with water highly charged with carbonic acid, as in a mineral water factory.

THE LETTER BOX.

A Day's Work in Tin Roofing.

From C. R., *Spokane, Wash.*—Kindly state through the columns of *The Metal Worker* the average number of squares of tin roofing (20 x 28 inch tin) a practical roofer can finish in one day's work of ten hours.

Note.—From statements of practical roofers on this question it appears that to lay, nail down and solder from three to four squares of 20 x 28 inch tin roofing on straight work is considered a fair day's work of ten hours for an average man. This is on flat seam roofing, for which the sheets have previously been matched and locks turned. For standing seam roofing the average is from five to six squares for ten hours' work. The tin is put down in strips, which are cut from rolls of tin put together and soldered in the shop. The workman has to turn the locks, cleat down the strips, make the standing seam and do whatever soldering is required to make this amount of roof surface tight. This does not include any extra fitting, flashing, coping, &c., but is for straight work only. There are many tinners and roofers who will be able to do a greater amount of work than the estimates given. There are also a great number of workmen who would not be able to accomplish the amount of work set as the average standard, though the quality of their work would be their recommendation. The difference between the time considered sufficient to do any job of roofing and the time it actually required depends on how the men are managed, and how the work is handled by foreman, as well as on the efficiency and willingness of the workmen.

Core Box Plane.

From PATTERN MAKER, *New York.*—The article of "R. A. F.," on core box plane attracted my attention, as I have been using just such a tool of my own make for many years. He says he never saw any except those made by the owners, but I have also one manufactured by Collins & Rice of Cleveland, Ohio, that is made of cast iron with extension sides for cutting large core boxes. My old plane is the favorite for small work, owing to its lightness, and, furthermore, a wooden plane does not wear the sides of the work like the end of an iron plane.

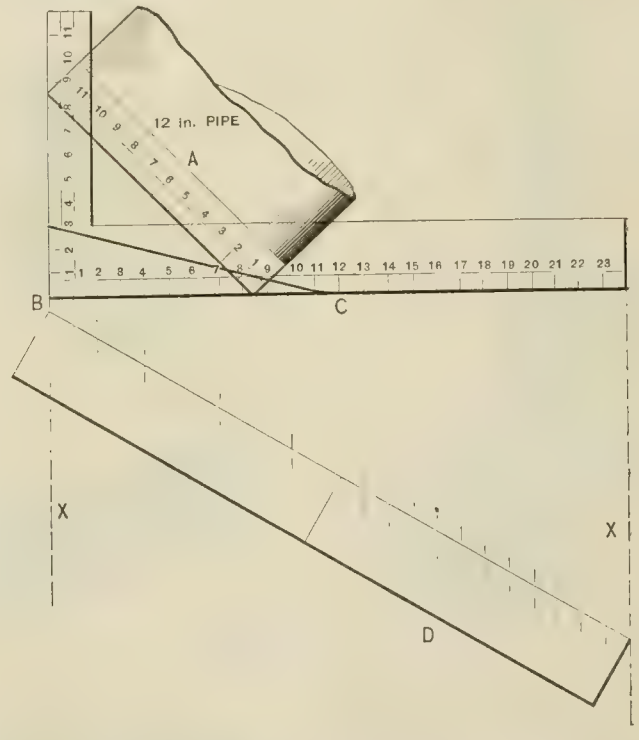
Gasoline Burner for Hot-Water Boiler.

From R. L. S., *Fredericksburg, Va* — I have a customer who has a hot-water heater for warming a house. The house is not a large one and he wants to use a gasoline burnner to heat the water, as he thinks it would be cheaper than coal. I wish to know where I can get such an arrangement and what would be the best way to connect it.

Note.—We do not know of house-heating boilers heated with gasoline fuel attachment, but if any of our readers have had experience in this line, or have any ideas to suggest, we should be glad to hear from them.

Circles and the Shop Square.

From H. W. W., *New York.*—I have observed from time to time in *The Metal Worker* during the last few months graphic methods for computing the circumference of a circle with a right angled triangle, or an ordinary square. It calls to my mind some calculations I have seen demonstrated with the square and rule, for example: The rule A, Fig. 1, is just 12 inches long and represents a pipe 12 inches in diameter. We will assume that there are two branches or pipes to be taken from the 12-inch main. What must the diameters of the branches be to equal the capacity of the main? By referring to Fig. 1 it will be observed that the rule A is 8½ inches from B on the base C, and 8½ inches from B on the perpendicular, which shows that two 8½-inch pipes must be used to equal the capacity of the 12-inch main. Again, suppose we had a 3-inch pipe already in what diameter will the other be. Place the rule A at 3 inches on the perpendicular shown by the single line, the other end will reach 11⅝ inches on the base C, which shows that a pipe 11⅝ inches in diameter must be used with the 3-inch to equal the 12-inch pipe; and in a like manner when one diameter is given it will give the other two, or when two diameters are given it will show the third. I saw, while finishing this sketch, a method of dividing a piece of any material into equal parts, which is shown and explained, without interfering or complicating the first explanation. In this case we have a piece that may represent a sheet of metal, a pipe, or anything else, 30 inches long, which it is desired to divide into 24 equal parts. Place it in an oblique angle so that both upper corners will bisect the lines X X in Fig. 1, which equals the 24 divisions.



Circles and the Shop Square.—Fig. 1.—Find the Diameter of Two Circles Having Area Equal to that of a Larger Diameter.

Fig. 2.—A Circle Inscribed within a Square whose Sides Equal its Diameter.

While discussing this subject to areas and circumferences of circles a good opportunity is offered to say a word by way of explanation of the arithmetical rules for computing the areas and circumferences of circles. All circles are to each other as the squares of their diameters, and these multiplied by the decimal 0.7854 give their area. The diameter of a circle multiplied by 3.1416 equals its circumference. To make the above statement plainer and more comprehensive I have made the sketch shown in Fig. 2. All its sides are equal, its angles right angles, and contains one square inch. The inscribed circle is one inch in di-

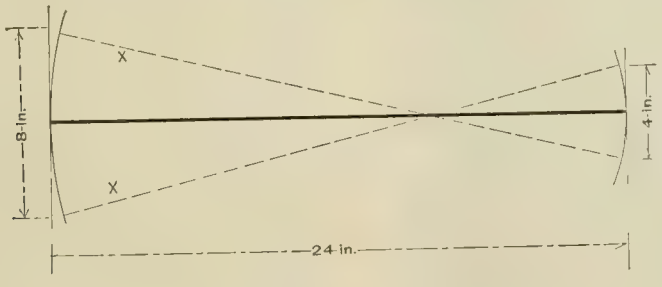
ameter. Although it is one inch in diameter, it contains only 0.7854 square inch, as shown by the shaded part. We will substract the circle from the square, representing the square by 1.000 — 0.7854 = 0.2146. Here we have the area of the three spaces, the square 1., the circle 0.7854 and the shaded part 0.2146.

Locating a Fulcrum.

From H. W. W., *New York.*—A handy way of locating a fulcrum on a lever is as follows: Divide the length of the lever by the sum of the two sweeps and multiply the result by one of the sweeps, which will give the distance the fulcrum must be placed from the sweep used. Suppose we have a lever 24 inches long and it has a sweep of 8 inches at one end, where must the fulcrum be located to give a sweep of 4 inches at the other end?

8 + 4 = 12, the sum of the sweeps.
24 ÷ 12 = 2, the result of dividing the length of the lever by the sum of the sweeps.
2 × 4 = 8, the result multiplied by the smaller sweep, giving the distance the fulcrum must be placed from it.

The cut shows the graphic method, which is to lay off the length of the lever, full size or to a scale, if you wish; also the given and the desired



Locating a Fulcrum.

sweep; then draw the diagonal lines X and X and where they bisect will be the point of location. Still another way of making this calculation is by the old-fashioned single rule of three, or proportion. As the sum of the sweeps is to the length of the lever, so is the length of either sweep to the distance the fulcrum must be placed from it on the lever. As 12 is to 24 so is 4 to the distance the lever must be located from it. The distance is determined by multiplying the means and dividing by the extreme 24 × 4 = 96 ÷ 12 = 8 inches, the distance the fulcrum must be placed on the lever from the end having the 4-inch sweep.

Heating Range Boilers.

From H. W. W., *New York.*—In reply to the inquiry of "J. H. B.," that appeared in *The Metal Worker* of July 15, would say that the heater A would circulate or heat the greater quantity of water, for this reason: Although the uptake tube of B is 8 inches higher it has less pressure, on account of the 8-inch column of water resisting its circulation; while, on the other hand, it has 8 inches more pipe on the uptake and about 2 inches more pipe to the supply. As the water backs are an equal distance from the tanks, the pipe B will have the shorter bends, and the shorter bends, together with the tortuous passage of the water through 10 inches of pipe, will be an impediment to circulation. There is also more surface in the pipe B exposed for the radiation of heat. These features would seem to overcome any advantage it would gain from the higher connection. To determine which of these tanks would circulate the quicker would, in my judgment, require a very careful test under the following conditions: Both tanks to be tested with the same water back and same range, coal, draft, &c., for the conditions of the two tanks are so nearly alike that to test them with separate water backs and ranges would leave the question as to which is the better undecided. It takes but a very small impediment to affect the free circulation of water in pipes by the application of heat. The particles of water absorb the heat from the iron, become expanded and are forced upward by other particles of greater density falling in their place by gravity. It is easy to appreciate, therefore, what a small obstruction would check the motion of this water. It is these obstructions that determine to a great extent the quantity of water that can be heated in a given time. It will be seen that if the better circulator of the two had any of these defects the poorer one would give the better results and we would still be in ignorance as to which embodied the more correct principle.

Flat Seam Roofing.

From WILLIAM SURRELL, *New Madison, Mo.*—I do not fully understand how "J. H." of Harrisburgh, Pa. lays his flat seam roofing, an account of which was presented in a recent issue of *The Metal Worker*, and I would be very glad to have him send me a finished sample.

Trouble with Water Back.

From F. M. P., *Washington, N. J.*—I would suggest to J. P. & S., Haddonfield, N. J., that perhaps they will find a partial stoppage either in the water back or pipes connected therewith. I trust that they will give a full report of the way in which they remedy the difficulty.

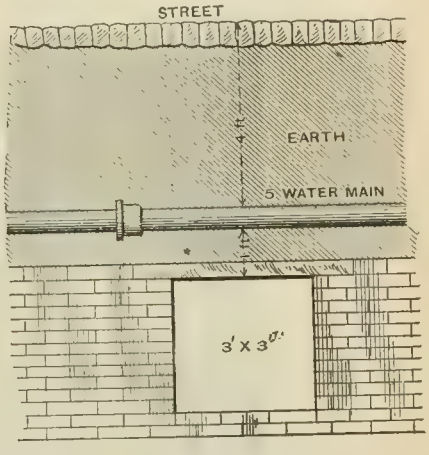
From C. B. T., *Shamokin, Pa.*—In *The Metal Worker* of July 15 is a letter from "J. P. & S.," Haddonfield, N. J., in reference to trouble with a water back. I once had an experience of the same kind, and found that the boiler was too large for the capacity of the water back. I would advise the correspondents to try a smaller boiler or two water backs.

From J. W., *Wappinger's Falls, N. Y.*—In reply to your correspondent "J. P. & S.," who write concerning their trouble with a water back, I would advise them to look at their hot-water pipe. I had similar trouble with a water back, and after much bother, found that the hot-water pipe was leaking.

Water Main Near Culvert.

From A. & M., *Tidioute, Pa.*—We send herewith sketch of a 5-inch water main on which we would like your advice in regard to the danger of its freezing. The pipe is to be buried 4 feet deep, and would lie but 1 foot above a stone culvert. How and what way would be the best to protect it from the frost coming up from below. Would you advise running the pipe below the culvert, which would then make it a depth of 10 feet from the surface?

Answer.—Of course the latter suggestion of our correspondent would be the most effective, and there would be no danger of the pipe freezing if put so far beneath the surface of the ground. Nevertheless, we think it would be needless expense and trouble to sink the main so deep. As a matter



Water Main Near Culvert.

of fact, while the culvert gives opportunity for freezing it is not to be presumed that the frost will enter on the sides of the culvert to any such depth as it would from the surface of the ground. The particular conditions will govern this matter very largely. For instance, we do not know whether the culvert is in the line of the cold winds, how long it is, whether curved or straight, all of which will govern the depth of frost from the sides and top. Unless it is in a particularly exposed place and in a very cold locality we think that a packing around the water main where it crosses over the culvert would prevent its freezing. Any of the well-known insulating materials could be used, preferably inside of a box, through which the pipe was run for a few feet over the culvert. A box 1 foot or 18 inches in size, packed full of a good insulating material, ought to be sufficient protection against frost in this one spot.

Hardening Sheet Brass.

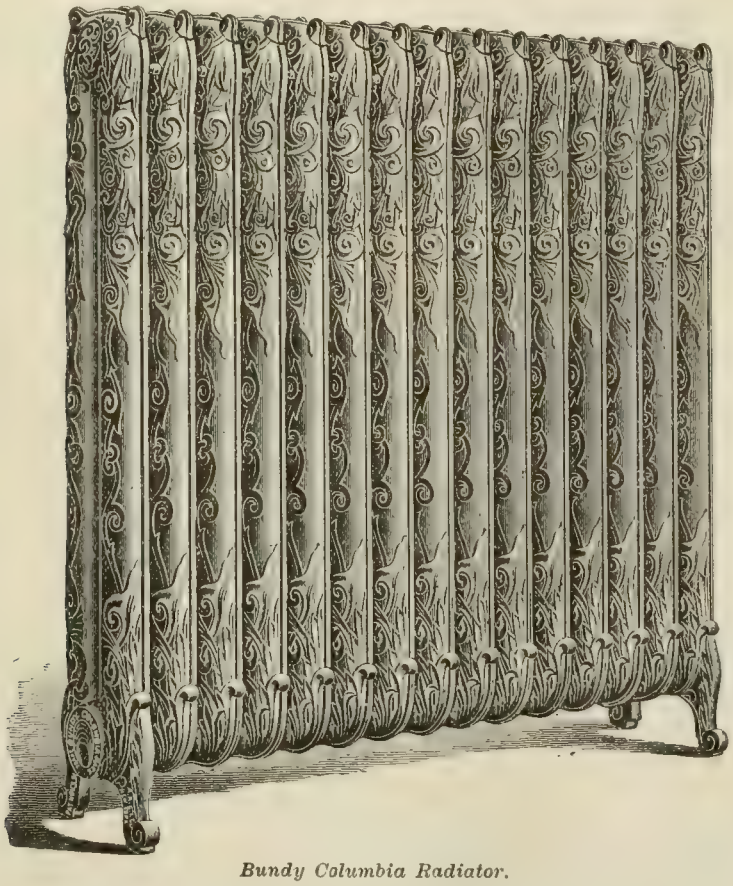
From C. O. L., *Brooklyn, N. Y.*—Please inform me how I can harden sheet brass after the same has been bent into shape?

Hon. Patrick Walsh of the Augusta *Chronicle* says that three things are necessary to make the South prosperous and independent—namely, diversified agriculture, the pursuit of mining, and the development of manufactures.

STEAM AND HOT WATER.

The Bundy Columbia Radiator.

The accompanying illustration shows a general view of the Bundy Columbia Radiator, which has just been put on the market by the A. A. Griffing Iron Company of Jersey City, N. J. The style of decoration they describe as Byzantine, tracing the general form of the figures back to the early centuries when this type of architecture prevailed. The firm inform us that the radiator was brought out in commemoration of the Columbian Exposition, where it is exhibited among their goods in Section O, Block 3, of the Manufactures and Liberal Arts Building. The radiator is made for both steam and hot water, in five hights from 45 to 20 inches, and is adapted to fit corners of rooms, bay windows, circles, columns, staircases or windows. The Radiator is put together with screw threaded nipples at the top and bottom, no packing or gaskets being used in its construction. A noticeable feature to which the manufacturers refer is the fact that the bottom and top of each section is enlarged, improving the appearance and furnishing a broad stand at the top upon which objects may be placed. The 45-inch radiators contain 5 square feet of heating surface per section and the 20-inch 2 square feet of heating surface per section.



Bundy Columbia Radiator.

HEATING NOTES.

W. M. MACKAY, the well-known heating engineer, has resigned his position as manager of the school and public buiding heating and ventilating department of the American Boiler Company to accept the management of the steam and hot water department of Hart & Crouse, manufacturers of the Royal Heaters. Mr. Mackay's headquarters will be at 236 Water street, New York, on and after August 1, where he will be pleased to see his many friends in the heating trade. He is now on a visit to the World's Fair at Chicago.

THE DEALERS in steam, hot air and hot water apparatus in Newark, N. J., recently had the pleasure of a visit from two genial business men from New York—L J. Parks, representing the Richardson & Boynton Company, and Geo. W. Plastow, representing the American Boiler Company.

A CIRCULAR with a very old-fashioned flavor to it comes to us from the Mason Regulator Company, 10 Central street, Boston, Mass. The publication, which is a folded card, is a similitude of a ribbon-bound note. The printed address is gotten up in true antique style and conveys instructions to the postman to carry it with the greatest speed. Within there is similar quaint reference to the Mason Regulator Company and their wares.

THE HOLLAND RADIATOR COMPANY of Chicago have sold 200,000 feet of the product of their Bremen plant to the J. L. Mott Iron Works.

THE THEO. JACOBS COMPANY, 72-74 Market street, Chicago, have taken the contract for the heating and power plant in the new Y. M. C. A. Building, 155-157 La Salle street. A 500 horsepower Heine safety boiler will be used in connection with 18,000 feet of radiation. The above firm are also to overhaul the heating plant in the Savoy Hotel, Michigan avenue, near Twelfth street. This plant was put in some two years ago by parties who are now out of business.

THE L. H. PRENTICE COMPANY, 203 and 205 Van Buren street, Chicago, have taken the contract for supplying six boilers, pumps, tanks, &c., for the heating and power plant in the old and new buildings of Mercy Hospital, Twenty-sixth street and Calumet avenue. The above firm are also to furnish the heating and power plant in the Greunewald Building, New Orleans.

A PAMPHLET DESCRIPTIVE of the Richmond heaters for steam and hot water, manufactured by the Richmond Stove Company of Norwich, Conn., is issued by Allen Black of St. Paul, Minn., and also in the interests of the two other firms of Allen Black & Co. of Duluth, Minn., and Black, Spriggs & Co., Grand Forks, N. D. The pamphlet of 20 odd pages is neatly bound in colored paper with gilt lettering. The inner pages of fine paper contain illustrations of the various Richmond heaters, both general and sectional views being presented. Brief particulars of the apparatus are given and tables of sizes, capacities and prices are likewise printed. At the close of the pamphlet are testimonial letters and a list of those using the Richmond heaters in the West.

THE THAYER HEATER COMPANY of 134 High street, Boston, Mass., distribute a neatly illustrated circular respecting their hot-water heater. The pamphlet, which is well published, consists principally of testimonial letters received from the various users of this apparatus. On the front page of the publication is a broken view of the Thayer heater, followed by some general remarks on the apparatus and hot-water heating. Then come testimonial letters and, later, a long list of some of their patrons, and this in turn is followed by a table of sizes, capacities, &c., and then come further illustrations of heaters, unions, special fittings, &c. Another publication issued by the same concern is a little black-covered pamphlet, entitled "Directions for Setting up the Thayer Hot-Water Heating Apparatus." This is a neat and serviceable little book, and will be distributed on application. It begins with some remarks on chimneys, the general arrangement of piping, sizes and capacities of heaters, &c.; then comes information about piping and sizes, as well as the radiating surface to be used.

THE UNITED STATES RADIATOR COMPANY of Loyalhanna, Pa., have been granted a charter with a capital stock of $50,000. The directors are G. C. Blackmore, New York City; D. L. Sloan, C. C. Elwood and C. F. Crawford of Pittsburgh; H. M. Mechling, James A. Shields and Nathan Miles of Greensburg.

ROOFING AND CORNICE.

Condensation Gutters on the Inside of Windows.

From W. N., *New York.*—In furnishing the roofing and cornice work for churches the specifications usually call for condensation gutters on all chapel and dormer windows. For the benefit of sheet-metal workers who may be called upon to do this class of work I think the following will prove interesting.

It is a well-known fact that warm air will rise upward, and when coming in contact with a cold surface, such as glass, for instance, the glass begins to sweat on the side having the warm air, an example of which can be seen in our dwellings during the winter months, thereby causing not a little moisture to accumulate.

Such was the case with a church I have in mind, the church being heated day and night, and all windows and ventilators tightly closed in cold weather. The chapel and dormer windows began to sweat continually, thereby causing the moisture to run down the wooden sill on the inside and ruin the frescoed walls. To overcome this a sheet-metal gutter was placed on the inside of each window, connected to a metal tube, which conveyed the condensed moisture to the outside. The descriptions and the diagrams herewith will show how the work was done. In Fig. 1 is shown the front elevation of a wooden or metal dormer window on a pitched roof, the roof covering being either slate, shingles, flat or standing seam tin roof. A and B represent the flashing around the sill of the dormer, which is soldered and riveted water-tight to the dormer in the shop, and is slated in with the the courses in case the roof was of slate or shingle. X represents the outlet of the tube, which is connected to the gutter on the inside. The glass in the wooden sash is shown in Fig. 1. Fig. 2 represents a sectional view on line C D in Fig. 1, and shows the rafter, Y Y, on which the roof

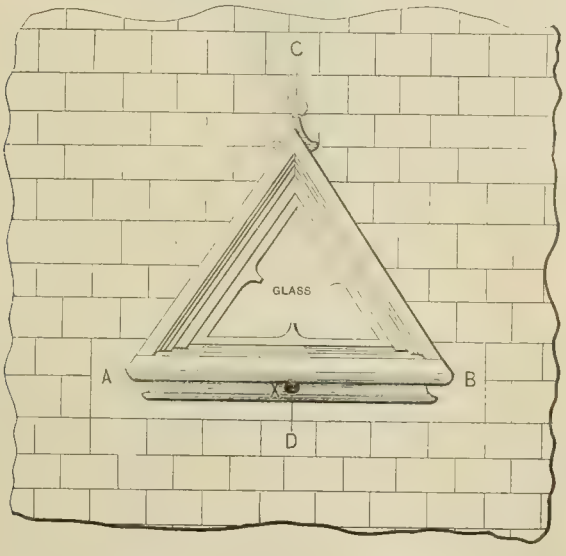


Fig. 1.—Front Elevation of a Dormer Window on a Pitched Roof.

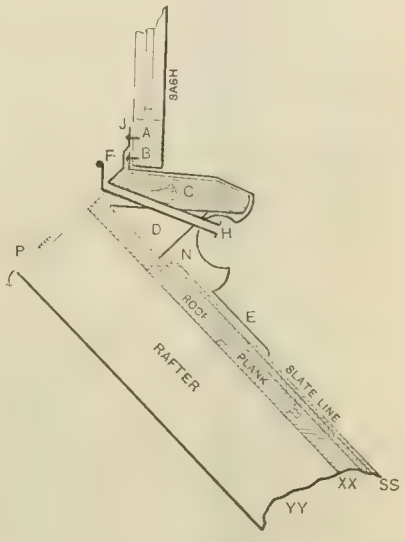


Fig. 3.—Enlarged View, Showing Fastening of Gutter in Fig. 2.

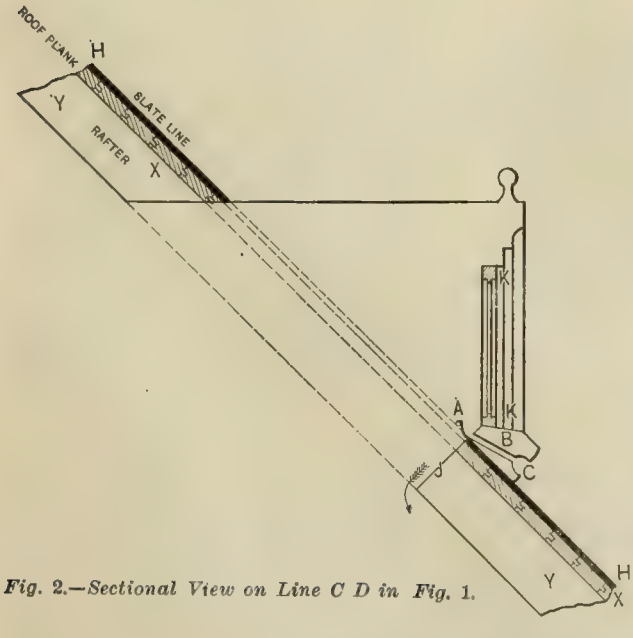


Fig. 2.—Sectional View on Line C D in Fig. 1.

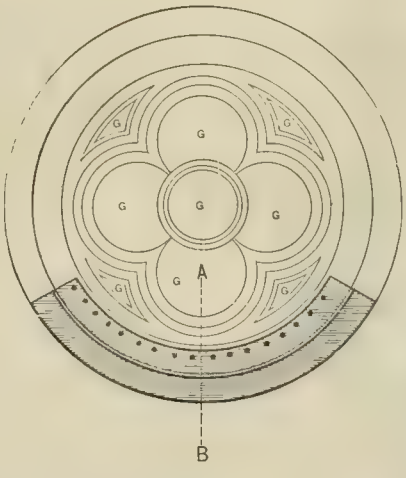


Fig. 4.—Inside Elevation of Circular Window, Showing Condensation Gutter in Position.

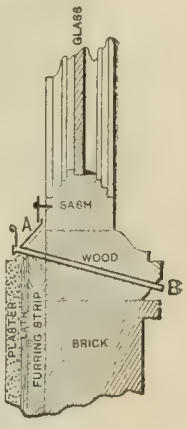
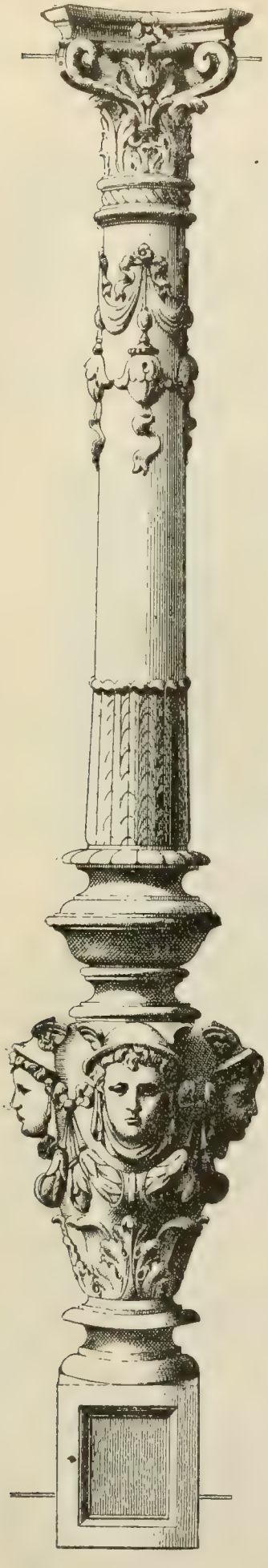


Fig. 5.—Sectional View through A B in Fig. 4.

CONDENSATION GUTTERS ON THE INSIDE OF WINDOWS.



Sheet Metal Covering for Iron Column.—Fig. 1.—Casing Complete.

boards, X X, are nailed, the slates being shown by H H. In this case the dormer was made of sheet metal and the wooden sash, shown by K K in Fig. 2, was placed in last, or after the dormer was set. The moisture dripping from the glass in the sash K K would follow the arrow J and drip inside of the building. A gutter was placed as shown at A, being nailed against the sash K. A tube in the center of the gutter was placed as shown at X in Fig. 1, and passing through the sill B projected over the cove molding C, as shown in Fig. 2. Fig. 3 is an enlarged view of part of Fig. 2, showing the manner of fastening the condensation gutter. Y Y represent the rafter, X X the roof planks and S S the slates. D is a wooden bracket nailed to the roof planks, on top of which the wooden sill C is placed. If the roof is of slate, after slating up as far as N, the metal dormer, with the flashing attached around and water-tight to the sill, as shown by A B in Fig. 1, is placed over the wooden sill C and over the slates, as shown in Fig. 3. After the dormer is framed on the inside by the carpenter the wooden sash shown in Fig. 3 is placed into the metal dormer from the outside, against the flange bent up on the metal sill, and nailed as shown at B. This flange prevents the rain, when striking against the dormer, from running or soaking to the inside, as was first supposed to be the case, before the condensed moisture was thought of. The sash being fastened the condensation gutter is formed corresponding to the shape of the inside sill, as shown by F J in Fig. 3. The length being obtained a head is soldered at each end and a hole punched in the center of the gutter, and at its deepest point, corresponding in size to the tube used, which is usually ¾ inch diameter. A wired edge is placed at the top of the gutter, as shown at F. The gutter is placed temporarily in its proper position and a mark made where the tube will pass through the wooden sill C. Then, taking away the gutter, bore a hole through the wooden sill C with an auger, and, using a small sharp chisel and hammer, cut a round hole through the metal sill, as shown at H. Set the gutter again in its proper position, placing a bedding of white lead between the upper flange J of the gutter and the bottom of the sash. The flange J is nailed every ½ inch with small tinned tacks, thereby making a good water-tight joint. The metal tube is now placed through the hole in the metal sill H and through the wooden sill C, from the outside, until it projects about ½ inch over the inside of the gutter; then with a small hammer a flange is turned on the tube and against the gutter, and soldered water tight, which completes the job.

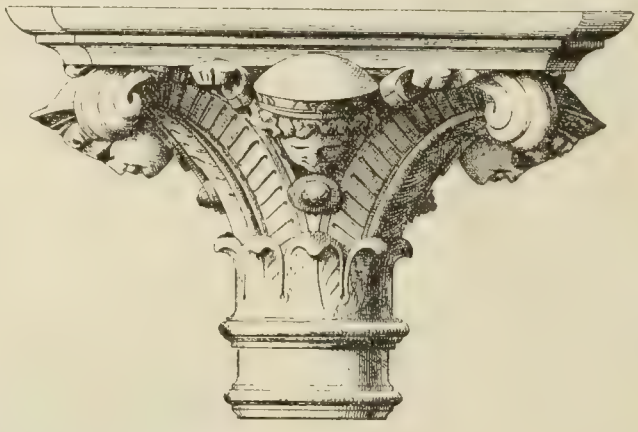


Fig. 2.—Capital for Casing.

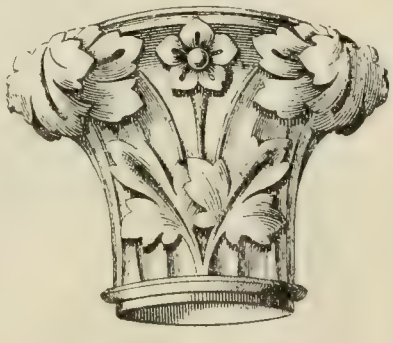


Fig. 3.—Capital for Casing.

The same method, shown in Fig. 3, would be employed on the chapel windows, with the exception that the latter are usually all made of wood. The writer has in mind a condensation gutter which was made for a circular window, 8 feet in diameter, over a choir in a church in Yonkers, N. Y. The gutter was made to correspond to one-third of the circle, as shown by the heavy lines in Fig. 4, and nailed along the edge of the sash, as shown, using white lead, as before explained, to obtain a water-tight joint. G G G, &c., in Fig. 4, indicate the glass. The method used to fasten the gutter and to connect the tube is the same as shown and described in connection with Fig. 3. Fig. 5 is a sectional view, taken on the line A B in Fig. 4, and shows the method of flanging the bottom of the gutter at A. The tube is shown at B. Care should be taken to solder water tight and heavily the two upright strips of the gutter to the bottom, shown at A in Fig. 5.

Sheet-Metal Coverings for Iron Columns.

Fred F. Bischoff & Co., 24 and 26 West Lake street, Chicago, are manufacturing a line of sheet-metal column coverings, Fig. 1, and capitals, Figs. 2 and 3, for decorating iron columns, illustrations of some of which are herewith shown. These articles are made of zinc or copper and in such lengths and sizes as may be required. For convenience in placing them about iron columns after they are in position, the coverings can be constructed in halves, the necessary joints being made by soldering. The space between the covering and the column can be filled with sand or plaster of paris, thus securing fire protection. The increasing use of iron and steel construction is furnishing an excellent field for work of this character.

FLASHINGS.

THE ACME ROOFING COMPANY, Canton, Ohio, are building, a two-story office building, 20 x 28 feet, the indispensable business correspondent, bookkeeper and their help having been gradually crowded out by the growth of their business. With all the necessary machinery for making steel roofing and corrugated, beaded, pressed brick and weather-board siding and cornices, cresting, finials, conductor and some new things in eave troughs, no doubt the additional space gained in the shop when the office moves to the new building will prove highly useful.

THE NEW MANUFACTURING BUILDING of the Canton Steel Roofing Company of Canton, Ohio, is full of busy workers turning out steel roofing, coated with their anti-rust graphite paint, and all of their specialties, though new machinery that is on the floor is yet to be put in operation and the office and paint house yet to be built. The promptness of getting in running order after being burned out is only a sample of the energy that is infused into their business.

THE BERGER MFG. COMPANY, Canton, Ohio, expect soon to be in the new plant they have been building about a mile down the railroad from their present location. It is arranged to save handling and to pass the raw material from department to department till it reaches the storehouse or cars completed. The main building is 60 x 600 feet, and here the machinery is located and manufacturing done. On both sides of this building is a railroad switch for receiving tons of tin plate and steel and shipping cars of goods. Across the switch and beside the main building is a pressroom 40 x 50 feet and a paint and storage building 40 x 270 feet. All of these structures are one story, of ample hight, and well provided with windows for light and air. At the end of the main building is a three-story brick building 35 x 70 feet, which will be used for offices and for drafting and designing rooms. In the new plant steel roofing in all its forms, steel and copper siding in some novel styles, ceilings, cornices, finials and all of the many specialties of the company will be turned out under advantages not previously possessed.

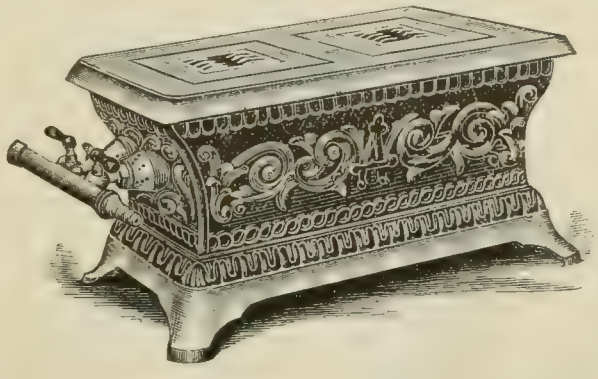
ADVICES from the West report a brisk demand for roofing materials, as many building operations are nearing completion. Tin plates, copper and other lines used for this purpose are being circulated in heavy shipments, prices being firm.

M. HARRISON & SON, 214 and 216 East Fifty-second street, New York, have a large well-lighted shop, provided with all essential tools and machines for turning out cornices, skylights, ventilators, gutters and builders' sheet-metal work.

PROMINENT AMONG the varied products of the Newark Sheet Metal Ware Company, Newark, N. J., is plain and corrugated galvanized leader. A new machine has recently been made for them by Ohl & Haefner of the same city, which turns out an 8-foot length in 40 seconds. A galvanizing plant is now being erected, when the leader will be made of black iron and afterward galvanized. Sheet-metal railway supplies are manufactured for many of the principal railroads, each requiring special sizes and shapes suited to their rolling stock. Valves and plungers for sheet-metal pumps are other lines that are sold to widely separated ship chandlers and pump makers. Some specialties are made in stamped and pieced tinware, for bakers' and confectioners' use. Their showcase contains some fine samples of brass and copper goods, in funnels, measures, coal hods and confectioners' trays.

The Fire King Water Heater.

A. Weiskittel & Son, Baltimore, Md., have placed upon the market a new gas water heater which is shown in general view in the accompanying engraving. In putting in a heater of this kind, where a range water back and circulating boiler are already in use, the makers state it is only necessary to cut the circulating pipes and insert two tees to connect with the gas water back. By this arrangement hot water can be obtained from the boiler whenever either of the water backs are in use. The exterior of the Fire King water heater here shown is made of ornamental cast iron, while the water generator itself is made of cast brass. Two powerful burners are provided running the entire length of the water back and when both are in operation it is stated that a 30-gallon boiler can be heated to about 95° in half an hour. When the water in the boiler is heated to the desired temperature, one of the burners can be extinguished and the flame of the other turned down so as to generate only a sufficient amount of heat to keep the water hot. The water heater is provided with two boiler holes in the top so that cooking operations may be carried on at the same time the water is being heated if so desired.



The Fire King Water Heater.

What's in a Name?

It is said that the London publishers of Rudyard Kipling's new collection of short tales under the title of "Many Inventions," have received inquiries respecting the work from representatives of more than one trade and technical journal, who were evidently under the impression that it contained a record of novel devices, mechanical or otherwise. When Horne Tooke's "Diversions of Purley," an abstruse philological work, was reprinted a few years ago, it was ordered by numerous circulating libraries in the expectation that it would be found to be light literature of a diverting kind. Similarly Ruskin's books have, it is said, frequently misled folks by their erratic titles. For instance his "Treatise on Sheepfolds" has been repeatedly in request by bucolic individuals anxious for information about the housing of sheep. They are generally disappointed on finding that the book is a theological essay. The same author's "Sesame and Lilies" has been sometimes catalogued among horticultural works.

Flimsy Kerosene Cans.

In a recent report to the State Department U. S. Consul Plumacher, at Maracaibo, complains of the careless packing of American kerosene received by importers at that place. In every consignment recently received there is said to have been much loss by leakage, notwithstanding the most careful storage and handling. Desiring to reduce as much as possible the gross weight, upon which duties are levied in Venezuela, American shippers of this oil have gone to extremes. The kerosene is packed in tins of 5 gallons each, two of them being stowed in a tight-fitting wooden box. The tin now in use is much too thin, and the wooden boxes are of light material fastened by too few nails. The result is that many tins arrive empty and others require resoldering, while the boxes are practically in pieces. A great proportion of the kerosene does not remain in Maracaibo for consumption, but is sent to various points in the interior of both Venezuela and Colombia. Before this can be done both tins and boxes must be thoroughly repaired, which expensive process may have to be repeated several times before the oil arrives at its final destination, thus increasing its cost. Moreover the leaking oil is liable to damage other cargo.

Consul Plumacher strongly recommends the use of a heavier and more carefully soldered tin for the inside cases of kerosene.

The wealthiest nation on the globe, according to an exchange, is the United States, which has an assessed value of $47,475,000,000; next coming Great Britain with $43,600,000,000; France ranks third with $40,300,000,000; then Germany with $31,600,000,000; Russia comes next with $21,715,000,000; Austria follows with $18,065,000,000, and Italy succeeds with $11,755,000,000; Spain is worth $7,965,000,000; the Netherlands, $4,935,000,000; Belgium, $4,030,000,000. The assessed valuation of Sweden is $3,475,000,000; of Canada, $3,250,000,000; of Mexico, $3,150,000,000; of Australia, $2,950,000,000; of Portugal, $1,855,000,000; of Denmark, $1,830,000,000; of the Argentine Confederation, $1,660,000,000; of Switzerland, $1,620,000,000; of Norway, $1,410,000,000; of Greece, $1,055,000,000.

PLUMBING and GAS FITTING.

New Mercury Gauge.

A. Y. McDonald Company, 168 Lake street, Chicago, are putting on the market a new mercury gauge for gas-fitters' use, which is herewith illustrated. Fig. 1 is a general view and Fig. 2 a sectional view. It is 10 inches in length over all. Enough mercury is placed in the chamber to seal the glass tube about ⅜ inch, the cap screwed on, and it is ready for use. The mercury cannot escape, no matter in what position the gauge is placed. It can easily be carried in the pocket.

Fig. 1.—General View of Gauge.

Fig. 2.—Sectional View through Gauge.

New Mercury Gauge.

There is no necessity for removing the mercury except to clean occasionally, which should be done with any gauge.

Massachusetts Plumbing Regulations.

An act for the licensing of plumbers and the supervision of plumbing in Massachusetts has just been passed into law by the State legislature. Its enactments are briefly as follows: 1. No person, firm or corporation not now engaged in the business of plumbing can hereafter engage in or work at the business, either as a master or employing plumber, or as a journeyman, unless he has received a license therefor. 2. Such license to be obtained by application to the Board of Health having jurisdiction in the locality where he intends to work, except in cities and towns where the inspector of buildings has control of the plumbing regulations, in which case the application must be made to such officer, when the application will be referred to the Board of Examiners, by whom the candidate will be examined as to his qualifications. 3. In every city and in each town of 5000 inhabitants or more, having a system of water supply or sewerage, there will be a Board of Examiners, consisting of the chairman of the Board of Health, and where there is such an officer, the inspector of buildings, who will be members *ex-officio* of the board; and a third member, who must be a practical plumber, to be appointed by the Board of Health, and who will hold office for one year. Where there is no inspector of buildings a second practical plumber will take his place on the Examining Board. 4. The Examining Board will designate certain times and places for the examination of all applicants wishing to engage in plumbing within their jurisdiction. If satisfied with the applicant's practical knowledge of plumbing, house drainage and plumbing ventilation, the board will so certify to the Board of Health or inspector of buildings, who will grant the necessary certificate. These licenses will be valid throughout Massachusetts, and be renewable annually upon payment of a fee of 50 cents. 5. The Board of Health or inspector of buildings of each city or town to appoint one or more inspectors of plumbing, who will hold office until removed by the board, their compensation to be paid by the local treasury. The inspectors to inspect all plumbing work for which permits are granted, and report all violations of any regulations regarding plumbing. 6. Each city or town coming under the operation of the act to prescribe rules and regulations for the materials, constructions, alterations and inspection of all pipes, tanks, faucets, valves, and other fixtures by which waste water or sewage is carried. No plumbing work to be done, except in the case of repair of leaks, without permit being first issued. This does not apply to the city of Boston, a special statute law of 1892, governing that city alone, having provided the regulations. 7. The act does not apply to persons who may be learning the business of plumbing until such time as they are sent out to do practical plumbing. 8. Penalties for violating the act are fixed at a fine not to exceed $50, and the license of the offender may be revoked by the examining board.

TRAPS AND VENTS.

"High Grade Lavatories" is the title of a handsome publication just issued by the William S. Cooper Brass Works, Philadelphia, Pa. The pamphlet, 11 x 14 inches in size, contains illustrations of an extensive line of lavatories and lavatory fittings. A special page illustrates Cooper's Porcelain-lined roll rim bath. Twenty-four illustrations are given of the special forms of lavatories, having bowls of various shapes and adapted to different positions. Corner lavatories are shown, while others are for barbers' use and fitted with several bowls. The cuts are neatly executed and all the necessary descriptive particulars are given in connection with them. Later on in the pamphlet are two pages of colored illustrations, showing the appearance of the decorated lavatory basins. At the close of the pamphlet are given sectional illustrations of the Protectus waste, the Security anti-syphon trap, lavatory brackets, faucets, &c.

An International Sanitary Exhibition will be opened at Havre, France, on August 17. The exhibits will include models, plans, material necessary for sanitation of soil, dwellings, cities, institutes, hospitals, &c.

The Bailey-Farrell Mfg. Company, Pittsburgh, Pa., are showing something new in noiseless water closet goods that is interesting and a seat that is fastened to the closet independent of the wall. The latter feature has become in general demand and has several material advantages over a seat that must be fastened to the wall, even though it disfigure handsome tile work and is not substantially rigid.

Geo. L. Simonet recently returned to his old home in West Hoboken, N. J., from Thun, Switzerland, where in the Chartreuse, a hostelry of seventeen rooms, he has been doing the plumbing and gasfitting and erecting a hot-water plant. About 1000 feet of surface of Bundy, Elite and Defiance radiators are used, and a Florida boiler, which was from necessity so set that it is six feet above the radiators on the first floor. One of Terrill's gas machines is used to supply the gas for lighting. The plumbing work comprised every convenience according to the most modern system. After all the work was completed it was submitted to a critical test in operation and a certificate in the possession of Mr. Simonet tells that everything worked in a manner that was in every particular satisfactory. Congratulations on the success of his trip and safe return are received wherever he calls on his friends.

The Goulds Mfg. Company of Seneca Falls, N. Y., have issued a catalogue describing their Duplex water lifters, which have a general application, filling supply tanks in residences, office buildings, &c. They may be employed where the water pressure is insufficient to carry the supply to all points desired, or where the supply is impure, for pumping other water supply from cisterns or other source. The only condition precedent to the successful operation of the Duplex water lifter is a pressure of at least 10 pounds per square inch. The lifter is modeled after the Duplex pump, which, as is well known, consists of two steam pumps of equal dimensions placed side by side and each dependent upon the other for its valve movement. The Duplex lifter, having water-power cylinders in place of the steam cylinders of the steam pump, consists of two pumps of the same dimensions placed side by side, with the valve motion so designed that the movement of the piston of each pump will control the movement of the slide valve of the opposite pump, the effect of which is to allow one piston to proceed to the end of the stroke and gradually come to rest. During the latter part of this movement the opposite piston moves forward in its stroke, and also gradually comes to rest; but in its move-

ment forward and before reaching the end of its stroke the slide valve controlling the first piston is reversed, and in consequence the first piston returns to its original position, and, in nearing the end of its stroke, it in a similar manner reverses the slide valve controlling the second piston. These movements are both uniform and continuous so long as the water is supplied to the power cylinders. This form of valve gear enables the lifter to be run at any desired rate of speed. The catalogue gives full particulars as to the amount of water that can be raised to a given hight with different working pressures, and the amount of water under pressure needed to raise a given supply.

In response to a call from a committee of five to the 150 plumbers in Newark, N. J., and vicinity, a good number attended a meeting on the 27th to form plans to organize a permanent association of master plumbers. Among the objects sought will be the co-operation of the Board of Health in arranging sanitary regulations, a better protection to the trade and the diffusion of the knowledge necessary to the modern plumber. The experience and support of some of the prominent plumbers of New York and Brooklyn has been assured.

The Use of S Traps.

From C. M., *Potsdam, N. Y.*—Please tell me through the columns of *The Metal Worker* the objections to using an S trap to bath, sinks, washbowls and other fixtures on a job of plumbing in a building of two or three stories; also what are the advantages of special forms of patented traps?

Answer.—We do not know of any objection to the use of S traps in the positions named by our correspondent, except, of course, where they are employed without a vent. To simply make an S bend in the waste pipe of the fixture is not adequate protection against the gases of the sewer and drains. A trap of that form is easily syphoned, and there is no certainty whatever that the water will seal it continuously. By the use of a vent pipe—that is, another pipe running from the crown of the trap either into the soil pipe above the highest fixture or else through the roof of the house, the various waste pipes are ventilated and all danger of syphoning the trap is overcome. The special traps to which our correspondent refers have many advocates, and in a general way the claim is made for them that their use obviates the necessity of employing vent pipes. These special traps are so constructed that the seal is not broken by the conditions that would affect the seal in an ordinary unvented S trap.

An ingenious general information machine has, says an Australian exchange, been recently set up in a railway station in Melbourne. By pressing different electric buttons the following, among other things, will appear: A list of the best hotels in the city; a list of the plays at the theaters, with their play bills; a list of the omnibus routes and the cab fares to the various parts of interest, &c. The principle of the machine is capable of infinite expansion, and doubtless we shall soon hear more of it on this side of the Atlantic.

Concerning Heat.

Professor Sells gave a course of lectures in the Old Free Library, Manchester. The conduction and convection of heat were lucidly explained by the lecturer, who illustrated his remarks by means of experiments performed before an oxy hydrogen lantern, and thrown upon the screen through a double reflector. The transmission of heat through solids differing in amount with different bodies was illustrated by means of heating four bars covered with a thin layer of wax, the bars being of copper, brass, iron and glass. The bars transmitted heat in different proportions, thus melting the wax around them at different times. The copper bar transmitted heat the fastest. The brass and iron bars followed, and the glass was the last to melt the wax. This proved the relative conductivities of certain bodies and illustrated how bad and good conductors could be chosen. Glass, the lecturer said, was almost a non-conductor, while brass was, they all knew, used for pipes in engines. A table of relative conducting power was thrown on the screen. Silver was first, the capacity being taken at 100°, brass followed and bismuth came last, being only 2°. The lecturer here stated that when we became rich enough possibly silver might be used for the improvement of locomotion. An instance of the application of a bad conductor of heat was the asbestos glove used by the firemen of engines for taking up hot bodies without damaging their hands. The lecturer, by means of placing a sheet of asbestos on his hand, held a ball of red-hot asbestos without experiencing much inconvenience, and by making a hollow in his hand he averred that it was possible for him to hold anything hot on his hand for any length of time. This again introduced the next point of thelecture, viz., the small conductivity of most gases. He said that if he were to put water on his hand he could illustrate that liquids also were bad conductors. Air being a bad conductor of heat, double doors, walls and even double windows should be put in houses. After the same theory, clothing which contained the greatest amount of cells, notably silk, wool and felt, were the warmest because they could store up the largest amount of air. The lecturer here mentioned the Norwegian cooking box, which is made entirely of felt of various thicknesses. A fire is lit under it and the food is put in to cook and covered in with a felt lid. The fire is allowed to go out and the cooking box may be left for any amount of time up to ten or twelve hours, or until the meal is ready for consumption. This box is not only used for cooking purposes but is also an ice house, as when cool, the box will preserve ice for a long time. This, said the lecturer, was the first time he had heard of a cooking stove being capable of being used as an ice house. Proceeding, the heating of liquids and gases by transference of particles was illustrated, the heat being applied from below by a Bunsen burner. The heated particles becoming relatively lighter, ascended. This ascension of the heated particles was used in expelling the used-up air from mines. To illustrate this a large test tube was introduced and an oblong body was let down in it so as to cause a narrow passage of air round the side of the test tube in a U shape. At one side a small candle was burning, and at the other side a piece of smoldering brown paper was put. The smoke from the paper descended on one side and came up at the side the candle was on and out at the top.

Construction and Care of Wicks.

In the course of a paper recently read before the Edinburgh Association of Science and Art, on the "Burning of Mineral Oil in Lamps and Stoves," John Laing offered some useful information and advice in regard to the construction and care of wicks, of which the following is an extract: "With reference to wicks, said Mr. Laing, those made from long staple cotton draw the oil freely and regularly from a long distance and would empty any font without any diminution of capillary power, but tightly plaited wicks of short staple cotton have not so good capillary powers, and accordingly the flame was not supplied with such a regular supply of oil necessary for complete combustion and a good light. Such wicks are apt to char and also give a higher temperature to the burner. A wick rather on the loosely woven side is, on the whole, best for the majority of burning oils unless they were of light specific gravity, in which case one closely woven was considered the best. The quality of any oil could not be judged by its appearance when first lighted; it would be better to burn a font out till none was left, taking note of the character of the flame at intervals from beginning to end. A good distillation oil should not lose much in such a test, but chemically-treated oils would do so. It was not always the fault of the oil, however, when the light was poor and dropping; old wicks were frequently to blame. Before a new wick was used it should be dried before the fire, or put into an oven for a short time till no watery vapor comes from it, and while it was still warm it should be put into the oil. The longer a wick was used the worse lighting results it gave. When there was a double wick lamp or stove, one wick should never be left unlit, as the one lighted will char the unlighted one, and generate a dangerous amount of heat; and on no account should a wick tube be left minus a wick while the lamp was burning. When a lamp was not in use, the wicks should be turned down slightly below the top of the wick tubes. Lamps and stoves should never be charged only half full, because if vapors were given off in any quantity there was ample space for mixing with the air to a dangerous extent. On the other hand, brimful charges were very dangerous because of the expansion of the oil by the heat, which involved the risk of bursting the oil font. All wicks should be long enough to reach the bottom of the oil font; when they become shorter a new wick ought to be supplied. The question as to whether glass or metal fonts were the better was difficult to answer. Each had its advantages and disadvantages; but all glass fonts should be inside metal containers, as in that case there would be less danger if an explosion occurred.

The first gun of modern ordnance for the protection of New York is now in position at Sandy Hook. It is a 12-inch gun, weighing 51½ tons, and is mounted on a Snyder disappearing carriage. It is the first 12-inch gun built in this country. It was constructed at the Watervliet Arsenal, and has fully borne out all the expectations of its designers.

WORLD'S FAIR NOTES.

The Judges.

Much dissatisfaction was expressed last week because the names of the appointees for judges were not announced in all the departments. Those appointed for the department of electricity are as follows: H. S. Carhart, Ann Arbor; H. J. Ryan, Pennsylvania; B. F. Thomas, Columbus, Ohio; George F. Barker, Philadelphia; T. C. Mendenhall, Washington, D. C.; Robert E. Owen, Lincoln, Neb.; Michael O'Dea, Notre Dame, Ind.; W. M. Stein, Chicago; Samuel Reber, United States Army; H. A. Rowland, Baltimore, Md.; E. P. Warner, Chicago.

The judges had been appointed because they were expected to get together on Saturday in the different buildings and organize for work.

Scotchmen Come Here to Learn.

One of the most noteworthy arrivals at Jackson Park last week was "The Artisan Expedition to America," projected by the *Courier* and the *Weekly News* of Dundee, Scotland. The party consists of ten specialists in the departments of metallurgy, electricity, textile, shipbuilding, paper making, mining, building, transportation, agriculture, and wood working, under the conduct of James Murray, formerly chief reporter of the two newspapers. Its object is the acquisition of reliable information concerning the conditions of the American wage earners, how they live, what kind of houses they have, what hours they work, what leisure they enjoy, and what kind of food they get.

Electricity Lectures Practically Illustrated.

Chief Barrett has arranged for a series of lectures in Electricity Building that are expected to prove a popular feature of World's Fair education. The lectures will be given daily by experts in charge of exhibits, each man selecting the subject in which he is best equipped for discussion. After each lecture the audience will accompany the speaker to the exhibit that has been under discussion and a practical illustration of the talk will be made.

Most of the exhibitors in Electricity Hall have agreed to assist Chief Barrett in carrying out his plan, and he is confident that the course will prove of great interest to students of electricity.

Attendance and Profits.

During the month of June the World's Fair cleared, above all expenses, $1,017,898.94. The receipts for the second month, as returned by Auditor Ackerman, were $1,660,820.21 and the expenditures $642,921.27.

Contrasted with the first month of the exposition this result is all that the managers could desire and more. The receipts for May were $719,402.71 and the expenditures $609,883.87, leaving a profit for that month of only $109,518.84. The profits for the second month were consequently ten times as great as for the first four weeks.

It is unreasonable to expect anything like that increase during any of the following months, but the gain is steady, and July will show a much wider margin of profit than June, which was fully up to the expectations of the managers. Aside from the large increase at the turnstiles, the returns from concessionaires will be much greater. The managers have settled most of the disputes with concessionaires, who held back their funds waiting for compromises on account of the delay in getting their electric lights in place. The revenue from concessions is expected to reach $20,000 or $25,000 a day from now until the close of the fair. Mr. Ackerman's report, which closed June 30, shows that $580,006.36 had then been realized from concessions. Since that date large payments have been made by shop keepers and others doing business on the grounds.

The report shows that $1,286,675.26 was due contractors on July 1, but Mr. Ackerman says this was largely reduced after the report was made up. The largest amount due on any one contract was $260,469.58 for the electric light plant. The heavy receipts by the fair are particularly gratifying on this account, because so many contractors were creditors after the gates were thrown open to the public. Quite a number of Chicago firms were put to great inconvenience by reason of the non-payment of their claims on the completion of work. The disbursements are a little late, but they will make the times more endurable.

The Jurors.

Full information regarding World's Fair Judges of awards is not yet accessible. The following jurors for Manufactures Department, nominated in executive session sometime ago, were confirmed for the groups named on the 21st inst.:

Glass and Glassware.—R. M. Atwater, Syracuse, N. Y.; John Corcoran, Wheeling, W. Va.; Charles Colne, Brooklyn, N. Y.

Chemical Products—Professor Appleton, John Brown University, Providence, R. I.; Prof. C. F. Chandler, Columbia College, New York; Major King, U. S. A., Willetts Point, N. Y.; George E. Lorenz, Toledo; William McMurtie, New York City; Prof. Albert Prescott, Ann Arbor, Mich.; Prof. W. B. Rising, Berkeley, Cal.; Prof. Ira Remsen, Johns Hopkins University, Baltimore; Prof. S. P. Sharpless, Boston; William Simpson, Raleigh, N. C.; Prof. Edgar F. Smith, University of Pennsylvania, Philadelphia; Waldron Sharpleigh, Gloucester, N. J.; Marcus Salmon Benjamin, New York; J. D. Humphrey, Huntsville Ala.

Paints and Dyes.—J. B. Brewster, New York City; Dr. M. H. Drummond, New York City.

Ceramics and Mosaics.—Dr. W. S. Bigelow, Boston; Walter S. Lenox, Trenton, N. J.; Professor Morse, Boston; Henry Loomis Nelson, Washington, D. C.; Salomon P. Stratton, Boston.

Plumbing Materials—H. E. Bullock, Illinois; W. E. Clow, Chicago; Morton Y. Cady, Moline, Ill.; Hugh H. Hannah, Indianapolis.

Cooking and Heating Apparatus.—Romyn Hitchcock, Washington, D. C.

Monuments and Undertakers' Supplies.—Dr. J. Henry Jackson, Barre, Vt.; L. G. Laurean, New York City; Charles H. Morgan, Worcester, Mass.

Scales.—Samuel H. Howard, Caledonia Springs, Vt.

Wrought Iron and Thin Metal Goods.—J. L. Ketcham, Indianapolis; G. W. West, Birmingham, Ala.

Gold and Silver Ware.—David Pell Secor, Chicago.

Stained Glass in Decoration.—John C. Carpenter, Kansas; John La Farge, Judge A. B. Quinton, Topeka, Kan.

Carvings in Various Materials.—A. H. Dainty, Chicago.

Materials of War, Hunting and Sporting Goods.—W. C. Dodge, Washington, D. C.

Safes, Hardware and Cutlery.—John Griffith, Philadelphia; E. R. Strauss, Chicago.

Typewriters, Paper and Stationery.—Charles L. Hamilton, Philadelphia; C. A. Lownsberry, North Dakota; E. Morgan, Springfield, Mass.; William O'Shea, Lincoln, Neb.

Judges Named but Not Assigned to a Particular Group.—Prof. E. C. Carpenter, Ithaca, N. Y.; Hounton Chapman, Uniontown, Ky.; Ernst Fenelosa, Boston; F. D. Higbee, Chicago; H. H. Jackman, Kansas; G. W. Johnston, Hastings, Neb.; H. I. Kimball, Atlanta, Ga.; Russell Sturgis, New York City; Charles A. Schaeffer, Iowa City, Iowa; John W. A. Strickland, New York City; L. W. Williams, Oak Cliff, Texas; Robert D. Williams, Albany, N. Y.

Although some of the judges are already at work inspecting and comparing exhibits, the full list will not be given to the public until some time this week.

The Judges Organize.

The judges met on the 15th inst. to arrange for the work of examining exhibits and making awards. Those appointed for Mines and Mining held their meeting in the reading room of that building. About forty members were present. Prof. J. C. White, Professor of Geology and Mineralogy in the University of West Virginia, was elected president. The matter of selecting two vice-presidents was left to the foreign jurors, to report the names of two of their number at 2 o'clock Monday afternoon. Joseph D. Weeks of Pittsburgh, Pa., was chosen secretary. He will be given a paid clerk, upon whom the burden of the clerical work connected with the office will fall.

The departmental committee for machinery met in its room at 1 o'clock, in the east gallery of Machinery Hall. The following judges were present:

George H. Barrus, Boston; Prof. Lewis S. Rober, Pennsylvania State College; O. E. Smith, Norfolk, Va.; William Sooy Smith Chicago; R. H. Thurston, Ithaca, N. Y.; W. C. Lamont, Bucyrus, Ohio; Marcellus Gould, Manchester, N. H.; Frank P. Holt, Laconia, N. H.; William C. Margodaut, Hamilton, Ohio; Thomas R. Pickering, Portland, Conn.; Francis J. Reiss, Evansville, Ind.; A. J. Monovale, Washington, D. C.; Prof. Jones, Adams, Mass.; John A. Roche, Chicago; James Denton, Stevens Institute, Hoboken, N. J.; L. C. Billings, William Y. Young, Medford, N. H.

The committee elected John A. Roche chairman and P. A. Bloom vice-chairman, and then adjourned to 11 o'clock Monday.

The judges of the section covered by exhibits in the Manufactures and Liberal Arts Building met in a committee room in that building. It was decided to make a division of the work here, and two chairmen were designated—Dr. Buenz, in charge of the Artistic Manufactures and H. I. Kimball in charge of Commercial and Economic Manufactures. Mr. Kimball, is from Atlanta, Ga., and was the director general of the Atlanta exposition. A. B. Kendrick of Boston was elected secretary pro tem. An adjournment was then taken to Monday to receive specific instructions with regard to exhibits to be examined.

THE RETAIL STORE.

Local Checks.

We are in receipt of a letter from the correspondent in Virginia whose communication in regard to the payment of bills by checks on local banks called out the article in our last issue from a "Long-Suffering Jobber." In this letter our Virginia correspondent takes exception to the position of the jobber in which reference is made to the method of paying with local checks as "a system of petty robbery." Our correspondent then continues:

I will call his attention to the fact that he has overlooked the strongest point in my article, which was that in trade as in war it is useless to complain of your adversary's manner of conducting the campaign, and that the only thing to be done is to apply such remedies or acts of retaliation as are at hand, and this the "Long Suffering Jobber" can do by returning the checks to those who send them to him. If he is thoroughly consistent and really wishes to keep out of their hands, let him instruct his salesmen not to solicit their business, and further let him erase their names from his list of those to whom to send circulars, and we opine that he will not be longer a victim of such injustice.

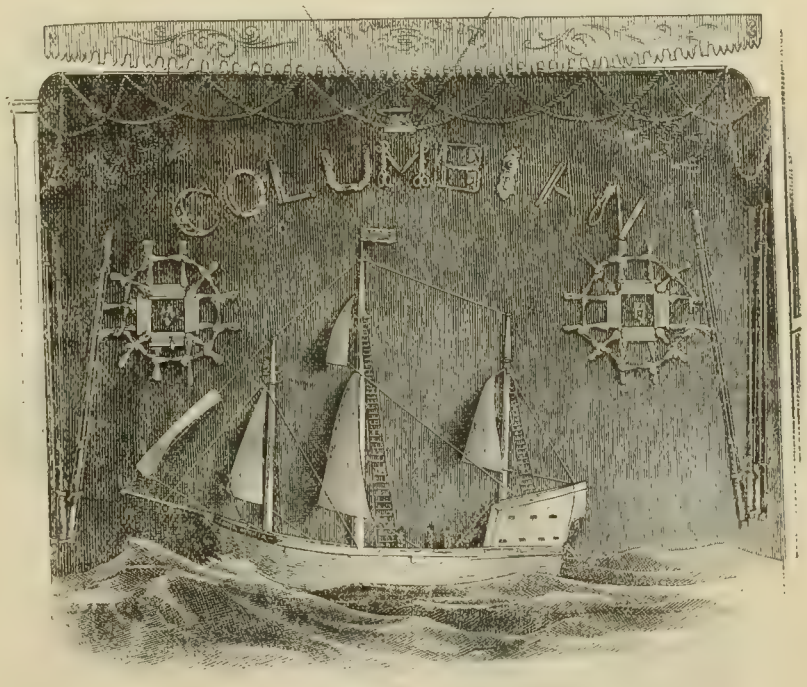
Touching upon the same subject we have the following communication from a prominent New England manufacturer, in which it will be seen that while our correspondent disapproves of the payment of accounts by local checks, he is pleased to receive them and to pocket the loss entailed in their collection:

I have read with interest the communications from "Banker" and "Retailer" and the replies thereto. Unquestionably "Banker" is right, and local checks do not pay in full, but are an imposition on the creditor or his bank of whatever the cost of collection may be. To be strictly just, the debtor in sending them to a distance should make them payable "with exchange," which makes them worth par anywhere (if of any size). Amounts less than $1 should be sent in postage stamps.

Ten years or more ago we used to complain of local checks. We do so no more, and are only too well pleased if customers in the United States or Canada send us local check promptly when bill is due. Not that it is right, for customers should send funds worth par, but the custom is growing with many buyers. Some do not think and others do not care. Others are ignorant—for instance, the man who sends New York draft for $49.75 to pay a bill of $50, charging the exchange to his creditor.

Window Arrangement.

From the State of Washington we have an example of up-to-date window dressing. Cochran Bros., Montesano, Wash., favor us with a photograph of a window picture, which is reproduced in the accompanying illustration. The Columbian year is well represented here by Hardware articles, as everything used in the make-up of the picture, except the background, is directly connected with the Hardware and Metal trades. The hull of the ship is of sheet lead, the sails of building paper, the masts of tin, the rigging of copper wire, and the water of green wire cloth. A Cross-Cut Saw forms the top of the picture, with Coil Chain looped beneath, in the center of which is suspended a small Anvil. The word "Columbian" contains Chain, Dog Collars, Coil Spring, Rules, Scissors, Safety Chain, Wire Nails, Drawer Pulls, Escutcheon and Rose, Carpenter Pencils, Hog Ringer, and Bit. The wheels on either side are made up of Fish Lines on blocks and in hanks, with Reels in the center. It is hardly necessary to add that the window attracted a great deal of attention, and that the enterprise and ingenuity shown in getting up so elaborate a design were favorably commented upon.



Columbian Window Dressing.

Husking Gloves No. 45.

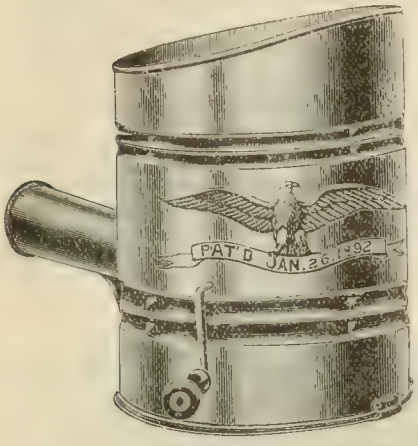
Hall & Ross Husking Glove Company, 253–259 Elston avenue, Chicago, Ill., are introducing the gloves herewith illustrated. The manufacturers state that the gloves are made of oil-tanned hog skin, as one of the best wearing leathers for hard work, and that it overcomes the great trouble found in using cheaper leather, as being oil tanned it will not harden by wetting.

Husking Gloves No. 45.

The company advise us that they have enlarged their manufacturing department and are fully able to take care of all their trade, including the United States and Canada.

The Eagle Sifter.

Sills & Grossman Company, 86 Lake street, Chicago, have brought out an improved Flour Sifter, which is herewith illustrated. The Eagle Sifter, as it has been called, operates on the same principle as other rotary Sifters, but in addition it is provided with a patent bottom, which can be closed, as in Fig.



The Eagle Sifter.—Fig. 1.—Sifter with Bottom Closed.

1, when not in use, thus preventing the flour from escaping when placed upon the table or pantry shelf or while being carried about the kitchen. It thus prevents the loss of flour and, being more cleanly than a bottomless sifter, commends itself to thrifty housewives. The bottom is hinged to the body of the sifter and is so accurately fitted that it makes a very tight joint. It is held in place by a brass spring, which requires but a slight pressure to

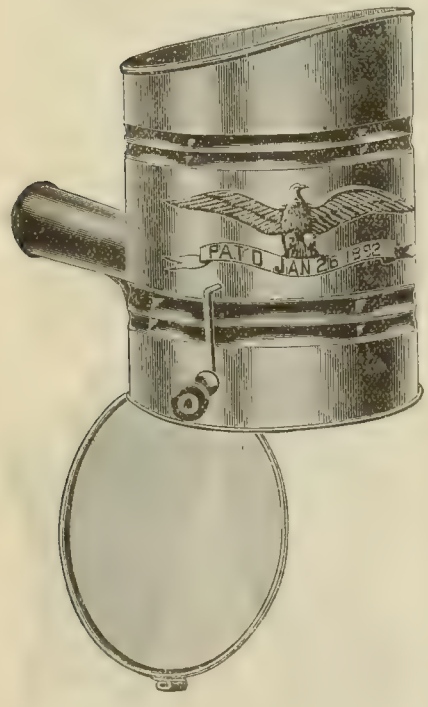
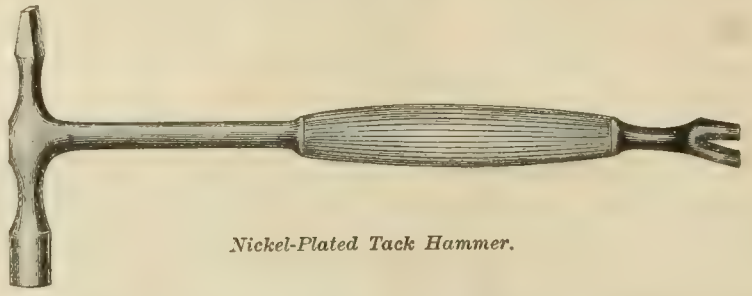


Fig. 2.—Sifter with Bottom Open.

let the bottom down ready for use, as in Fig. 2. The body of the sifter is made of the best quality of tin plate, the crank is strongly made so as to endure much wear, and the top is finished with a sharp edge so as to scoop flour easily.

Nickel-Plated Tack Hammer.

Troy Nickel Works, Troy, N. Y., are offering a tack hammer as herewith

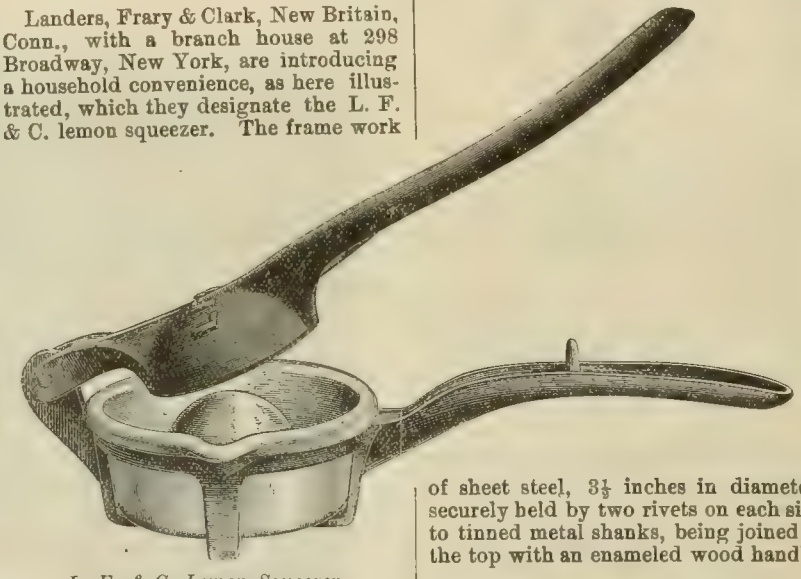


Nickel-Plated Tack Hammer.

shown. The hammer is made of steel, full nickel plated, with the handle part of rubber. The manufacturers refer to the article as being especially adapted to ladies' use.

L. F. & C. Lemon Squeezer.

Landers, Frary & Clark, New Britain, Conn., with a branch house at 298 Broadway, New York, are introducing a household convenience, as here illustrated, which they designate the L. F. & C. lemon squeezer. The frame work

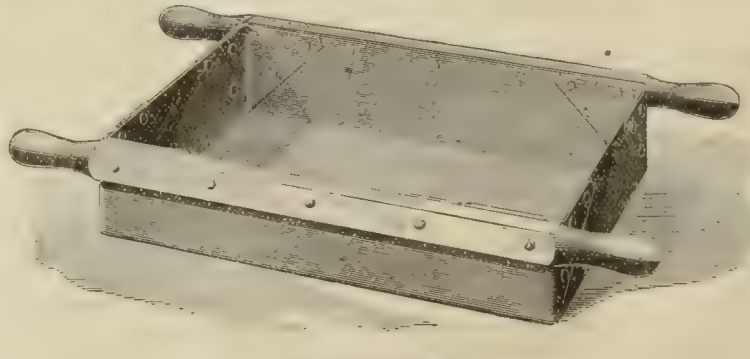


L. F. & C. Lemon Squeezer.

is of iron japanned, the under portion being so constructed as to furnish a firm support for the cup of block tin into which the juice is forced. This cup will receive the juice of two or three lemons and has a lip on one side, which insures a good pour. The squeezer is 10 inches long, the cup being nearly 4 inches across and 1½ inches deep.

New Hand Barrow.

W. J. Clark & Co., Salem, Ohio, are manufacturing a new kind of hand



New Hand Barrow.

barrow made of sheet steel, an illustration of which is given herewith. The manufacturers claim that the barrow is lighter, more durable and cheaper than barrows made of wood, and state that for use in shops and factories, where hot metal articles have to be handled, it is especially desirable. They also remark that they are useful and economical in many places where wheelbarrows cannot be used.

Ring Chopping Knife.

E. S. Anderson, Gloversville, N. Y., is offering a ring chopping knife, as here illustrated. It consists of a ring of sheet steel, 3½ inches in diameter, securely held by two rivets on each side to tinned metal shanks, being joined at the top with an enameled wood handle,

Chopping Knife.

held in position by means of a long rivet. The extreme hight is 5 inches. This gives 10¾ inches of chopping edge, which will not clog. It can be quickly cleaned and easily sharpened. This article is marketed through James A. Bogardus, 167 Chambers street, N. Y., as sales agent.

The Electric Vise.

The Capital Machine Tool Company, Weedsport, N. Y., are offering the trade a line of vises, represented by the machinist's swivel-bottom iron-workers' vise, shown in Fig. 1, the construction of which is given in detail in Fig. 2. The vise is of the rapid transit pattern, and requires, it is stated, only one movement in and out, one turn of the hand, to secure the work. The manufacturers remark that the vise is strengthened in parts subjected to wear and strain to prevent the breaking and wearing out of the mechanism in the engaging parts. An anvil is made on the back and top part of the vise, and the vise body reaches across full width to allow for a large range of work. The adjustable jaw is shown in Fig. 3, which is referred to as being well made and tempered. These are furnished either checked or smooth. The pipe chuck attachment, Fig. 4, is made of solid steel, one set of the jaws being fitted rough and the other set made smooth for finished work. The advantages claimed for this arrangement of chuck in connection with this vise are that it is quick and easily swiveled to any angle for long or short work; that it holds the work firm and steady without crushing: that the work is instantly placed in the vise jaws or taken out, avoiding the use of set screws or taper pins, and that it is a durable device for holding long or short pipes, rods or bolts. The chucks are made in ten sizes to hold pipes, &c., from 0 to 6 inches. At present only one size of vise is ready, this being No. 15, weighing 45 pounds, but in a short time the manufacturers expect to have nine different sizes on the market.

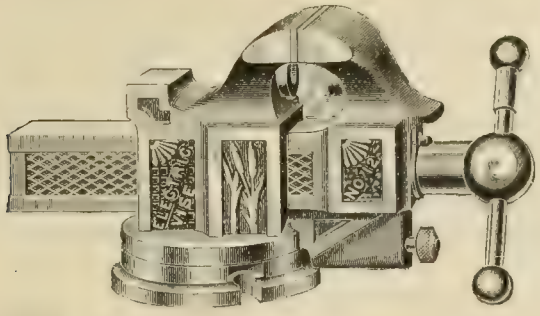


Fig. 1.—The Electric Vise.

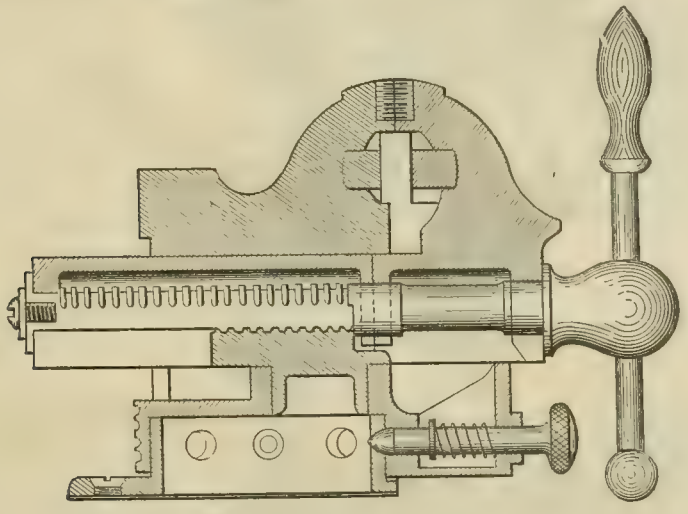


Fig. 2.—Electric Vise in Detail.

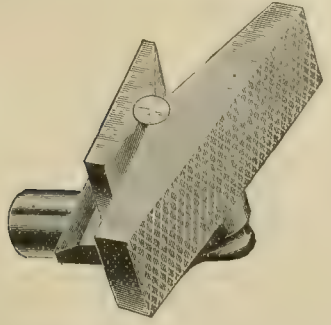


Fig. 3.—Adjustable Steel Jaw Attachments.

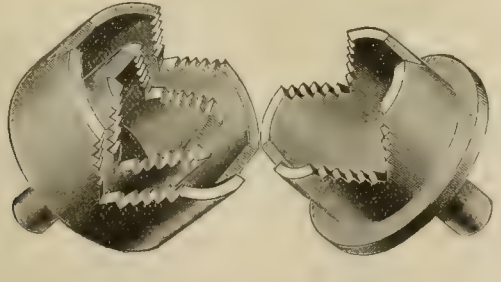


Fig. 4.—Little Giant Pipe Chuck.

Odorless Stew and Fry Pan.

The Wilmot & Hobbs Mfg. Company, 20 Murray street, New York, are introducing an automatic cover-raising and emptying odorless stew and fry pan, as illustrated herewith. The utensil is stamped seamless from smooth surface, cold rolled Swedoh steel, with the odor flue riveted on the outside. Fig. 1 shows the pan in use with the cover closed, and with the bail and cool handle in a vertical position out of the heat and away from the other utensils on the stove. The point is made that the handle is always cool and not in the way, as with a saucepan or spider handle. The cut also indicates the way in which the fumes of cooking onions are carried up the stove pipe. In Fig. 2 the lid of the pan is automatically raised by pressing down on the handle, while it is explained that the reverse motion instantly places the cover again in position over the pan, and that the lid can be automatically raised by depressing the handle in either direction. The cover can be raised and the handle automatically locked in position to pour the contents from the pan, as illustrated in Fig. 3. The cover and handle are removed for shipping by taking out the hinge pin. The manufacturers claim that the utensil is light and durable, heating evenly and quickly and is instantly adjusted by the cool handle; also, that it is sure to prevent all odors and smoke from filling the room. The fact is emphasized that burning the fingers is avoided, as the cover works automatically and is always in place.

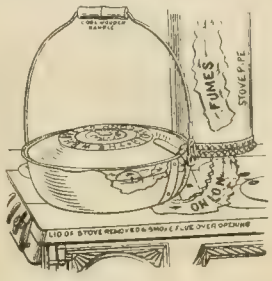


Fig. 1.—Odorless Stew and Fry Pan.

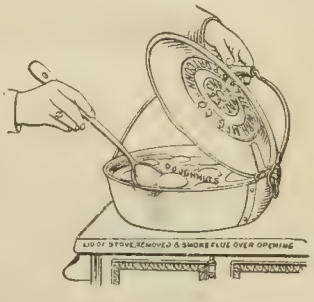


Fig. 2.—Automatic Cover Raiser.

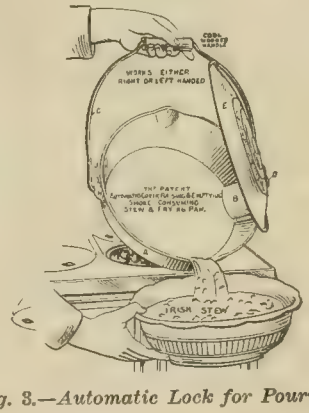
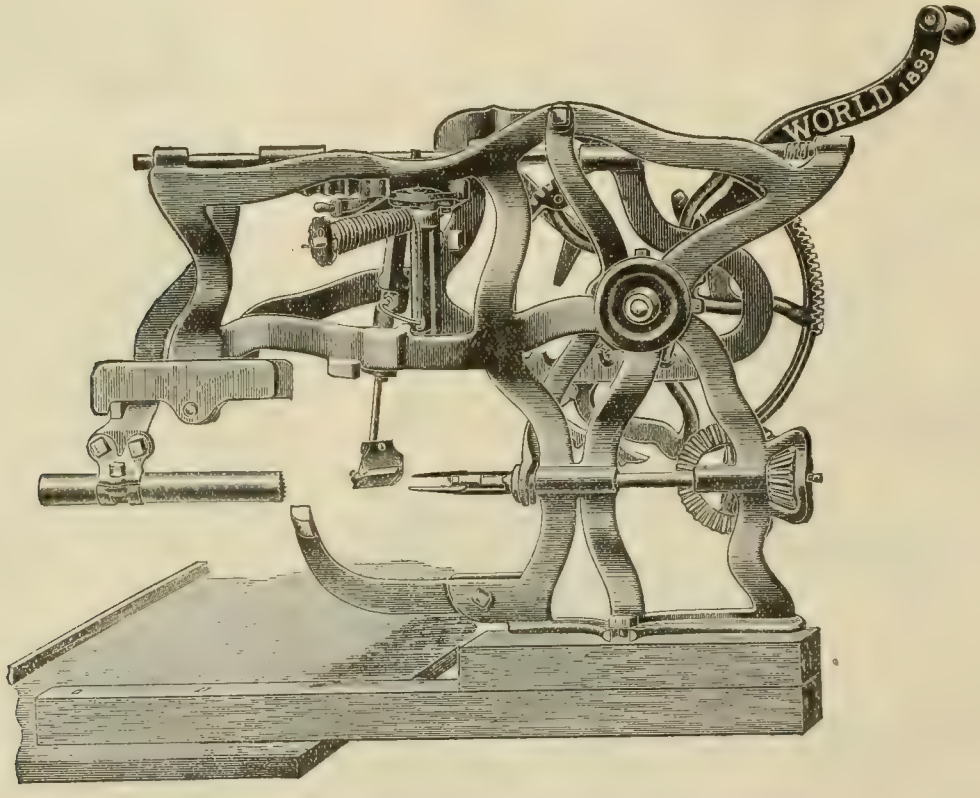


Fig. 3.—Automatic Lock for Pouring.

The World Apple Parer.

C. M. Heffron, Rochester, N. Y., is the manufacturer of the new apple parer represented in the accompanying illustration. Attention is called to the simplicity of the design and the few parts. An effort has been made to adapt the operation of the machine to the most natural movement of the hands. The parer is referred to as a one-turn machine, requiring but one turn of the crank to pare an apple. It is claimed that expert operators can run this machine without stopping, slacking down the speed to about one-half while putting the apple on the fork.



The World Apple Parer.

The Bear's Tail and Wire Nails.

BY THEODORE.

"Yes," said Joe Blackburn (the truthful Joe), "that was about the funniest experience I ever had on the road."

"'Nuther ghost story?" questioned one of the crowd in rather a disgusted way.

"No, siree; this occurred; this did!"

"Well! that is remarkable," said the questioner with pretended astonishment; "actually going to tell the truth. Well! the profession is going to the dogs sure nuff."

"I tell you this is all straight," said Joe.

"All right; go on."

"Well, I was traveling for a Hardware firm, trying to introduce a new line of goods into New England, and was meeting, of course, with immense success ——."

"Oh, of course!" came the sarcastic chorus from the crowd.

"With immense success, as I was saying," he continued not minding their chaff. "Well, it so happened, that in working through Maine I had to call at a small town, which was not much out of my way, in order to see an old fellow from whom we bought our axe handles. There was no trade in the place—regular woods, you know—and I did not expect to stay more than a few hours at the most, especially as it was in the middle of winter, and with no decent hotel in the place. I found the old fellow's place all right—queer old shop—and after we had settled the business on hand I started to go, intending to catch the one afternoon train; but he stopped me and invited me to stay overnight and join with him in a bear hunt on the morrow. Of course I stopped, for if there is one thing that I like more than another (and there is), it is skating across the snow, hot on the trail for bears. I ——"

One of the party interrupted: "Sure, it was not a cow or chipmunck, or something of that kind you were after?"

"It was bear, straight bear; suppose you will say next that I never saw one.

"Well, the next morning we started out with a rifle and an old breech-loader. We were not an hour's distance from the town when we struck a fresh trail, which must have been made that morning, as it had snowed lightly during the night. We kept on for about an hour longer, following the trail, which led us to a steep cliff, and we had a slippery time climbing up. The old man was carrying the rifle and he also had the shot for the breech-loader which I carried. We had just reached the top when by some mishap he slipped and down went the rifle and shot to the bottom of the cliff into a deep brook. Almost at the same moment we spied bruin making for us. There was no time to lose, so I drew the old breech-loader to my shoulder and fired. The shot missed, and on came the bear.

"'There is no more shot. We'd better run,' shouted the old man.

"Suddenly I bethought myself I had plenty of powder and in my pocket was a package of our justly celebrated Wire Nails. I hastily loaded the gun with them, and as the bear was passing a large tree I took aim and fired. The bear came to a sudden stop; but he did not seem hurt, and I prepared to load up again, when the old man burst out laughing.

"'Confound it,' he said. 'Blamed if his tail ain't nailed to the tree.'

"I looked, and was astonished to see the bear tugging away endeavoring to free himself. The Nails had struck him as he was passing the tree and his tail was firmly nailed to the bark. Well, we went up and dispatched him with a knife; but it took us nearly an hour to extract the Nails, and I have them yet, which proves the truth of my——"

"Joe," interrupted one of the crowd, "Joe, did you ever read the story about George Washington and the cherry tree?"

"Yes."

"Well, read it again."

STOVE TRADE NOTES.

The Future of the Hot-Air Furnace.

By A. W. Glessner,

President of the Excelsior Steel Furnace Company.

DECREASING COST OF FURNACE WORK.

In almost every attack on the hot-air furnace I notice that the fact that the prices realized in this branch of heating have been and are on the decline is cited as a reason for the decadence of the business. There has been a decline in prices, and this is to my mind the most hopeful feature of the business from the standpoint of the dealer, though discouraging to the manufacturer, who finds it very difficult to make a profit on a lowering market. To be sure, the cost of producing furnaces is decreasing yearly, partly by the steady fall in the cost of pig iron and steel, though a very small decline is reflected on the cost of sheets, and partly by better management in the foundry and finishing departments, which have reduced the cost of labor somewhat—but the cost has not gone down as rapidly as the selling price, which is due to the ever increasing competition in this line of manufacture. No article that enters into the equipment of a house is sold so much below its actual value as the hot-air furnace, and the outlook is not for very much higher prices, and the money must be made from the large increase in sales which these close prices should effect. In many sections of the country fair prices are obtained by the furnace manufacturer, but in the large centers the prices now ruling are abnormally low.

POSITION OF THE DEALER.

This places the dealer in a position to supply a furnace to the consumer at a price that should surely lead to ready sales during the normal times. At present the financial stringency may affect the sales somewhat, but the demand will be renewed later. In a city in the northwest of about 10,000 inhabitants one enterprising dealer recently told me that in 17 years he had placed nearly 200 furnaces, and had seen the price of the completed job drop from over $400 on an average to considerably less than $200 at the present time. This dealer took one of the prizes in *The Metal Worker* competition some years ago, and has made a careful study of his business.

DECREASED COST.

The decreased cost of furnace work is due not alone to the lower prices ruling on furnaces, but also to the reduction in the cost of registers, fittings and labor in installing jobs. The workman has grown more expert, and while paid more per hour now than formerly, he manages to perform more work in a given time. I have records of the cost of material and labor on numbers of jobs done several years ago by our company, and on looking them over I am surprised to note the lessening cost of the material, and this notwithstanding the increased cost of the tin plate entering into the fittings used. This is due to machinery, however, and at another time I will refer to the change in this department of furnace work.

In registers the decline has been pronounced, the goods being sold on closer and closer margins, and only the increased production has saved the makers from absolute loss.

Furnace heating is not the only branch that has suffered from the decline in prices. The steam and hot-water trades have much to complain of in the same vein, and it has required the greatest care to earn anything on the capital invested.

Radiation has gone down materially, and prices in all branches of heating have reached a low level.

(To be continued.)

The Detroit Stove Works

of Detroit, Chicago and Buffalo, have issued an exceedingly attractive catalogue showing their lines of cook stoves, ranges and heaters. The assortment is a varied one, embracing constructions adapted to meet all reasonable requirements of the trade, and the goods are offered in a style of ornamentation which cannot fail to please the eye of the dealer who is inclined to be artistic in his tastes. After a statement of terms, remarks relative to prices and advertising material and the presentation of a telegraphic code for use in ordering goods by wire, attention is invited to the Jewel wrought steel range, which is made in seven styles and four sizes. It is adapted for hard coal, soft coal, coke or wood, and embodies a number of special features, reference being made to the wrought steel oven plates, the oval fire pot, the sheet flue construction and the water coil front and back. Next in order we find the Buffet Herald steel range, designed to burn the same kinds of fuel mentioned in connection with the previous construction, and made in three sizes and six styles, several of which are illustrated. The general line of stoves made by the company, whose catalogue is under review, is known under the name Jewel, and something like 50 pages are devoted to ranges. These are offered under such names as the Merit Jewel, Empire Jewel, Prize Jewel, Pacific Jewel and Atlantic Jewel. Following these we find the cook stoves occupying something over 30 pages, and these in turn are followed by the heaters, with the Imperial Jewel base burner occupying the place of honor. This is a richly treated parlor stove intended for burning hard coal. Special reference is made to the automatic feeder cover, the fire pot, grate, ash pan, swell front, mica illumination and tea kettle attachment. A sectional view is presented showing the flue construction. The Crown Jewel, for hard coal, a new high-grade base burner made in three sizes; the Peerless Jewel, a medium-priced construction; the Radiant Jewel, a richly treated surface burner; the Fire fly Herald, an attractive Franklin; the Sunlight Jewel, another member of this class; the Oak Jewel; the Royal Jewel, a wood burning cottage parlor stove of handsome ornamentation; the Herald Box, together with a line of laundry stoves and farmers' boilers are presented. The closing pages of the catalogue are devoted to a list of repairs for Jewel stoves, an index to the telegraphic code, cuts of trademark intended for use by the company's customers for advertising purposes and a general index.

The New Plant of the Scranton Stove Works.

The first heat at the new plant of the Scranton Stove Works at Dunmore, Pa., was poured at 3 o'clock on the afternoon of Tuesday, July 18. The plant is fully equipped in every department for the rapid production of high grade goods, and in the erection of the buildings the company have not neglected the comfort of their employees. A representative of one of the Scranton papers recently visited the works and from the account which he gives of the plant we take the following particulars:

The floor has a concrete base 5 inches thick. Into this are imbedded oak sleepers and on these are 2-inch hemlock planks, on top of which is a flooring of 1¼ inch yellow pine. This makes a floor so solid that teams drive over it without jarring the building. Another advantage that it possesses is, that rats or mice cannot get beneath it, and the danger from fire is reduced to a minimum. The roofing is tongue and grooved hemlock and spruce, 2½ inches thick, covered with fire proof granite $\frac{3}{10}$ inch in thickness.

Every detail in the arrangement is complete, and workmen or visitors go from one department to another through aisles or gangways 10 feet wide, which enable teams, if necessary, to go in and out. Elevators are erected in convenient places so that the storage department can be reached without loss of time. An inclined trestle outside the works facilitates the handling of supplies, coal being introduced to the boiler room direct from the cars by means of a chute, and the sand used for molding goes into the foundry by a similar process. In the wareroom will be two elevators, one hand and one power. The works are located at Jefferson avenue and New York street, in the borough of Dunmore, and 200 feet outside the city line. They are reached by either of the suburban lines of the Scranton Traction Company which pass New York street two blocks from the plant.

THE FOUNDRY.

The foundry or casting room is 165 x 196 feet. It is in a flood of light. The cupola is in the center of the room to the side, and is equi-distant from all the farthest parts of the floor. The time required to carry a ladle of metal to any floor in the foundry being 33 seconds. This department is so constructed that 130 men can find employment—twice as many as could be employed in the old shop.

The cupola used for melting the iron is a straight one, with two charging

doors. The charging floor is light, airy and spacious, sufficiently so that a three-days' stock of coal and iron can be kept there without inconveniencing the workmen. The cupola has a capacity of about 12 tons per hour. It is double lined, and, in case it is desired to increase its capacity, one set of bricks can be taken out.

The stock yard is outside the works close to the cupola. Small cars for carrying the stock will run at the base of the trestle above referred to. When loaded it will be run on the elevator and taken to the cupola, where it is weighed. The company make a practice of weighing everything that goes in and that comes out of the cupola, being thus enabled to determine to exactness the loss in any particular grade of iron. The floor beams and plates surmounting the cupola are of steel. It is incased by four brick walls and the roof covering it is of corrugated iron. There is noting about it that will burn.

CLEANING ROOM.

Passing from the foundry the visitor finds himself in the cleaning room, the two being separated by a fire wall of brick. In the cleaning room are the rattle boxes, cleaning benches and the edge polishing machines. When the castings are cleaned they are put in a counting room and locked up. The next day they are counted and each man is credited with the product of his labor. There are two counting rooms, one for each alternate day.

FINISHING THE STOVES

After the castings are counted they are taken into the nickel-polishing room. Here they are put through a process incident to nickel plating. This room is 70 feet square, and carries nickel tanks, dynamo, hot and cold water tanks, potash and vitriol tanks. Adjoining this department is the mounting shop, where everything in that line needed in the stoves is manufactured. Adjoining this room is the pattern-fitting room, where all iron patterns for castings are filed and fitted.

The center of the mounting room, which is 145 feet by 200 feet in area, is given over to storing castings, raw material and brick used in manufacturing, and the New York street side of the room will be given over to mounting or putting the stoves together. Thus it will be seen that the process of making a stove is continuous. Light is furnished in the center of the mounting department by means of a monitor 35 feet by 80 feet in size.

Two 80 horse-power boilers made by I. A. Finch generate the steam needed in running the plant, and a 120 horse-power engine furnishes the motive power. The engine was built by the Dickson Mfg. Company, and the gentlemen connected with the stove works pride themselves on purchasing all supplies, when possible, in Scranton.

Besides the apartments described there is a three-story warehouse 40 x 100, in which will be shipping and advertising rooms and offices. This building has a basement that can be used for storage or manufacturing. A shipping platform outside the warehouse will be covered, and will be built up to a switch to be put in by the Erie & Wyoming Valley Railroad Company. In addition, there is a carpenter shop 30 x 56, two stories, and pattern shop 30 x 60, two stories, and a fire-proof building for pattern storage.

CONVENIENCES.

The company have expended in the neighborhood of $100,000, but much remains to be done. There is a tract of land at the rear of the works, 160 x 675 feet in dimensions, which can be used for dumping purposes. The entire area must be fenced, and much grading must yet be done. It is the intention of the company to introduce the Smead system of closets for the use of the men, and the boiler stack was built with this end in view. Bathrooms for the men will also be erected as soon as possible. The contract for heating every part of the building with steam is let to Hendricks & Co. of Carbondale, and the average heat will be 60°.

The plant contains improved methods, and it would be hard to find in any other place buildings covering several acres where it is possible to see all the men employed at the same time. The company own 30 lots in the vicinity of the works, on which it proposes to erect houses, which will be sold to employees at a reasonable price and on easy payments. Architect I. L. Williams prepared the plans for the buildings.

Veteran Stove Manufacturer.

To celebrate the fiftieth anniversary of his entry into the stove trade, Isaac A. Sheppard, the respected head of the well-known stove manufacturing firm of Isaac A. Sheppard & Co., Excelsior Stove Works of Philadelphia and Baltimore, 200 of his employees gathered at a banquet at Warner Hall, Philadelphia, on Saturday, July 22. Mr. Sheppard presided, and the five tables were respectively headed by the foremen of the different departments in the works. After dinner a gratifying surprise awaited Mr. Sheppard in the shape of a handsome silver cup, which was presented to him by Frank Lawrence, one of his oldest workmen, on the part of his fellow employees, as a token of their respect and esteem. The cup bears on one side the firm name, with the names of Franklin L. and Howard R. Sheppard, sons of Isaac Sheppard, and partners with him. In the center is a stamp bearing the "Excelsior" design, and on either side of the coin are views of the firm's two stove plants at Philadelphia and Baltimore.

Isaac Sheppard, who is one of the veterans of the stove trade, was born in Cumberland County, N. J., and is, says the Philadelphia *Ledger*, a descendant of two of the oldest families in the State—the Sheppards and Westcotts. He went to Philadelphia with his parents in 1840, both of whom died shortly after, and young Sheppard was forced to make his own livelihood. For a time he drummed up trade for the 'buses, which in those days were almost the only means of passenger conveyance, his duties consisting chiefly in calling out their destination and various stopping places to the crowds at the ferries.

In 1843 he apprenticed himself to the molding trade with the firm of Warnock & Co., where he remained until he had thoroughly mastered the business. In 1859 the firm of Isaac A. Sheppard & Co. was formed, and began business at Marshall street and Girard avenue, Philadelphia, proving so successful that a branch works was started in Baltimore seven years later. In 1871 the business at Girard avenue increased so rapidly that the present plant on Fourth street was secured. It covers four acres of ground, taking in the entire block from Montgomery avenue to Berks street, from Third to Fourth, the buildings having been previously used as the Fifth and Sixth streets car depot.

While giving close attention to business, Mr. Sheppard still found time to devote to political and educational matters. In 1858 he served the People's party in the Pennsylvania Legislature, and was twice re-elected, and while there was unanimously elected Speaker *pro tem.* In 1879 he was appointed to the Board of Education, and ten years later was elected president of that body. He was also one of the first to establish building associations in Philadelphia, and is still connected with several savings institutions. He is at present President of the National Security Bank, Franklin street and Girard avenue; trustee of the Northern Savings Fund, Sixth and Spring Garden, and of the Northern Liberties Gas Works. He is a Past Master in the Masons, Past Grand Master of the Odd Fellows and has been elected Treasurer of the Sovereign Grand Lodge. Among his charities Mr. Sheppard numbers a Memorial Home for Consumptives at Chestnut Hill, at a cost of $20,000, in memory of his son and daughter, both of whom died from the disease. His wife and two sons are living, the latter being associated with their father in the business.

The Comstock-Castle Stove Company.

We are indebted to the Comstock-Castle Stove Company of Quincy, Ill., for a copy of their forty-fifth annual catalogue, covering the line of specialties which they manufacture. Within its colored paper covers attention is invited to new lines of coal and wood cook stoves and ranges, as well as a new line of Todd stoves. The company state that last year they made an extensive addition to one of their buildings and are keeping both foundries in constant operation, enabling them to promptly fill all orders with which they may be intrusted. The opening pages of the catalogue are devoted to an index, notices to the trade with regard to terms, freight, breakage, &c., as well as charges for drayage, loading and crating stoves. The opening pages are given up to the consideration of ranges, which are offered under such names as the Economy, a six-hole construction for hard coal, soft coal or wood; the Prize, a new six-hole stove, mounted on portable base and provided with draw and drop hearth top, patent oven door opener and other modern features; the Noxol, another addition to the company's assortment; the Magic Argand and the Eureka. Under the name Steel King the company offer a line of ranges intended for burning hard or soft coal. The body is made of cold-rolled sheet steel and the heavy castings of Bessemer iron. The oven doors drop upon bracket hinges, forming shelves capable of supporting, it is claimed, a man's weight. They are of sheet-metal, having Russia iron face and elaborately carved cast-iron mouldings and nickel-plated center panels. The cook stoves are shown in profusion, one of the recent additions to the line being the Prize Economy, a four-hole stove embodying the modern features and decorated in an attractive style. This is offered the trade in three sizes and the usual modifications. The Captain, Bessemer, Banker, Omega, Champion and Ardmore (the latter being a new four-hole wood stove,) are some of the other goods, to which attention is invited. The heaters occupy the latter portion of the catalogue and include the Economy, a richly treated Todd stove; the Antique Oak, which has been improved for this season; the Standard Oak, which is similar to the

heater just referred to, but has a somewhat cheaper finish; the North Star, a sheet-iron surface burner, made in two sizes; the Minnehaha, a well built surface burner; the Benjamin Franklin, a new parlor heater for hard or soft coal; the World's Argand, the Chime, the Bugle and the Prince, the latter being a two-hole laundry stove for any kind of coal. Several pages are given up to hollow ware and a list of stoves for which repairs can be furnished.

The Keokuk Stove Works,

with office and works at Keokuk, Iowa, have recently issued from the press an illustrated catalogue and price-list for the season of 1893–94. In offering this publication to the trade the makers call attention to their new specialties, which are known under the name "Ideal." These include cook stoves and ranges, as well as heaters, and embody the modern features of construction and decoration. The volume is composed of something over 70 pages of well-arranged matter, bound in colored paper covers. The leading place is given to the New Electric range, a well proportioned six-hole stove, in which has been incorporated the conveniences characteristic of first-class constructions. It is made in a variety of styles and sizes, several of which are illustrated. The Grand Ideal, a four-hole cook stove, made with broiler feed and also with pouch feed, for coal or wood; the Model Ideal, the National A2 and the National A3, the Family Ideal, the Home Ideal, the American, in various series, and the Surprise, a neat, cheap cook stove, are illustrated and described. The place of honor among the heaters is given to the Ideal Parlor, a neat surface burner for hard coal. It has draw center grate, large flues, anti-clinker grate, mica door, full-size fire pot and large oven in the top. The American Parlor, made in three sizes, for hard coal; the New American Oak, made in four sizes and embodying recent improvements; the Paros, a neat cottage parlor stove; the Ideal, a neat Todd stove for wood only, having heavy corrugated linings, nickeled and tile ornamentation, and the New American Oak, with hot-blast principle. This is claimed to be a very powerful heater and is offered in two sizes. A sectional view shows the manner of applying the ventiduct flue. A long line of cheaper goods, consisting of globe, cannon, laundry and cottage parlor stoves, are also shown, while hollow ware, a list of repairs and miscellaneous goods constitute features of the closing pages.

The Walker & Pratt Mfg. Company.

A stove catalogue measuring 9½ x 11½ inches in size has been received from the Walker & Pratt Mfg. Company of 31 and 35 Union street, Boston, Mass. The volume is printed upon a good quality of calendered paper, the engravings are well executed, clearly showing the features of decoration of the goods illustrated, while the binding is in paper covers, carrying a side title typographical in character. The goods to which attention is invited embrace a complete line of heating and cook stoves, steam boilers and radiators, hot-water heaters, steam kettles, hotel ranges and broilers, tea and coffee urns, carving tables, hotel cooking utensils, &c. In connection with each stove is presented ample descriptive letterpress, which calls attention to the special features of construction and ornamentation.

The first place in the catalogue is given to the Crawford Grand, a substantial six-hole range made in four sizes and the usual modifications. The Columbia is a richly treated six-hole range, the ornamental features being especially noticeable. It is made in four sizes, has large oven, ample fire box, sheet-iron ash pan and an arrangement of the bottom plate which prevents warping. Following this stove is the New World, which represents the company's latest addition to their line of specialties. This is slightly below the Columbia and the Crawford Grand ranges, as regards the hight of oven, but is well proportioned and equal in material and workmanship to the best goods turned out by the company. The treatment of the oven door involves the use of a bronze panel representing the landing of Columbus. The range is fitted with patented kindling damper, triple shaking grate, reversible pipe collar, sheet-iron ash pan and flues easy of access. Other goods include the Crawford, New Archer, Nelson, Palace, Eureka, the latter range being made for the use of wood only; Walker's nine-hole Atlanta range and the Franconia. A varied line of laundry stoves made under the name of Pyramid, is also shown, together with the Walker Equator, New England and Lakewood furnaces; the Laconia, Bowdoin and Good Cheer Franklin stoves; the Walker sheet-iron surface burner; the Railway King cannon stove; the Crawford and Commonwealth heaters, together with a line of farmers' boilers, water fronts, couplings, &c.

The Gem City Stove Mfg. Company

of Quincy, Ill., have sent us a copy of their annual catalogue of stoves, ranges and heaters. The printing is in red and black upon a good quality of white paper, and the binding is in paper covers with an attractive side title. Special reference is made to a number of the constructions illustrated in the catalogue, several of which have recently been added to the company's assortment. The leading place is given to the Golden Gem, a four-hole range of attractive design and fitted with ventilated oven, extra heavy covers, double and cut centers, large draw-out hearth, capacious ash pan and patent oven-door opener. The fire back is warranted to last for five years. In connection with the illustrations of the stoves are given descriptive particulars, dimensions and code words for ordering by telegraph. Another attractive novelty in the line of ranges is the Gold Gem, a four-hole construction embodying the modern improvements, and decorated in a neat manner. It is made in several varieties and is intended for burning wood only. Among the cook stoves we notice the Golden Gem, Art Gem, Eureka Gem and the Famous Gem, the latter being a four-hole cook for coal or wood, having large oven, capacious flues and cut and double centers. This is a well-made cook, and is offered at low price. A neat four-hole wood cook is the Art Gem, which is well made and mounted and offered in two styles. A varied assortment of heaters are presented, among which may be mentioned the Gem Starlight Todd, the Metal Oak, a first-class heater, with double fire pot for coal and single fire pot for wood, large bailed ash pan, and other features to commend it; Art Gem Oak, a member of the same class; the Handy Oak, a neat, cheap stove, made in two styles; the Ruby, a heavy cannon stove; the Coronet, a neat box stove, and the Knox, a neat laundry stove.

ODD PLATES.

As a sequel to the export note which appeared in our columns in the spring concerning the furnace to heat a portion of Kilwaughter Castle at Larne in Northern Ireland, we learn that the whole apparatus has arrived out, has been set up and worked excellently. Furthermore, finding there are two rooms in a distant part of the castle not provided for, the owner, J. Galt Smith, has written the manufacturers, Uzal Cory & Co., New York, to send another for this specific purpose, size 30 or 36, and all the necessary accessories, pipe, registers, &c., at once by Cunard steamer.

The Senate of the National Union held its twelfth annual session at the Hotel Cadillac, Detroit, last week, and in the afternoon of the first day of the meeting the delegates and their friends took carriages for the Michigan Stove Works, where they were treated to a collation and speech by George H. Barbour. After the visitors had inspected the extensive works of the company a drive was taken through the prettiest portions of the city and in the evening a reception was held in the parlors of the hotel.

Baker & Myers, wholesale stove manufacturers' agents, of Cleveland, Ohio, are distributing among their friends in the trade an illustrated circular of the four-hole cook stove made under the names Reliable Friend and Famous Friend. The former is provided with a base while the latter is fitted with legs only. The constructive features include Wilkinson's reservoir and closet, tin-lined oven-doors, heavy centers, patent oven-door kicker, solid or sectional fire back, lift-out ash pan, and supported long center. The stove is neat and attractive in appearance and is made for burning coal as a fuel. The firm have recently purchased the patterns of the Clifton cook stoves heretofore manufactured by the Canton Stove Company of Canton, Ohio, and will continue the production of castings from them. The firm state that they found that some of the patterns required changes, and where such was the case improvements have been made.

The Quick Meal Stove Company have had plans drawn for an addition to their factory, and bids for the construction are now being received. The addition will consist of a four-story building 55 x 125 feet, which will be made to harmonize with the other portion of the factory. The entire four floors will be used for manufacturing purposes.

A new folder, bearing testimony of the satisfaction derived from the use of heaters made by the Howard Furnace Company, Syracuse, N. Y., was recently issued by W. B. Wilkinson of the New York house at 210 Water street. Comparing it with the sheet used when he first became manager of this branch, it shows the Howard furnaces have been well distributed over his territory and used in some fine residences, increasing the popularity of their system of heating houses by hot air.

An Art Bay State Range of the '93 style is a late attraction in one of the Beekman street windows of the New

York house of the Barstow Stove Company. The beautiful luster it shows is due to "Blackene," which the house handle. One of the recent orders placed by them was for an assortment of 500 stoves and another for 150. Seventy Bay State Franklin stoves were recently sent out, showing that the deep lustrous black of Russia iron, when made into a heating apparatus, proves attractive.

W. G. SEMPLE shows some nice orders for the Clover Triumph and Mander Emblem ranges as the result of a few weeks' work among the builders in Philadelphia. These goods are made by the Philadelphia Stove & Iron Foundry Company of Philadelphia. The Belle Triumph is a handsome new portable range of medium price, and the Emblem is a larger range which has been redressed and furnished with skirting and top shelf.

F. H. MOORE, treasurer of the Howard Furnace Company, Syracuse, N. Y., recently spent a few days in New York on a business trip, finding time, however, to give *The Metal Worker* the pleasure of a call after he had visited their New York house at 210 Water street.

"PENINSULAR FURNACES" is the title of a pamphlet of nearly 50 pages which comes to hand from the Peninsular Stove Company of Detroit, Mich. The matter is made up of illustrations and descriptive particulars relating to the line of warm air and combination warm air and hot water furnaces which are made under the "Peninsular" name, and which are offered in a variety of styles and sizes. The reasons why these goods are considered the best are set forth in a comprehensive manner, while sectional cuts indicate the proper manner in which a Peninsular brick-set furnace should be installed. Numerous tables give price-lists of registers, cubic feet of air which pipes of various sizes will discharge per minute, together with dimensions of galvanized iron and steel, list of materials required when estimating in portable and brick-set furnaces, and a form of contract which is used by the Peninsular Stove Company.

CINCINNATI STEEL RANGE & FURNACE COMPANY, Cincinnati, Ohio, present a very attractive argument to the buyer in their line of Burton steel ranges. Those intended for use in residences have been designed to please the eye, and present many conveniences indispensable to the cook. For hotel and similar use, whether large or small capacity is needed, the Burton goods can be adopted to the requirements and location. A carving table, with dressing pots for four meats, consists practically of a small stove and a long tank. The stove has a water back for heating the water in the tank, which circulates and keeps the food warm, and the smoke, running under the tank to the end away from the stove through a flue, escapes to the chimney only after its principal heat has been given off to the water in the tank. Their steel laundry, for house use, has found general favor, and the demand keeps pace with the production. In their office a very novel ornament hangs on the wall in a frame with a glass over it. Considerable artistic ability has been displayed in arranging cuts of the early stoves made by S. H. Burton to form a pyramid, which is enlivened by the use of portraits from the fashion plates of the same day. These heads and busts are made to peep out from the ovens and fire chambers of the stoves, and with the coloring they contribute the effect is increased. At the top is a figure with the American flag as a proper climax to such a foundation.

P. BETTS, an experienced hot-air furnaceman, has elected the Columbian Vulcan as the heating medium of the day, and is visiting the trade in the interest of the Keeley Stove Company, Columbia, Pa., showing a new catalogue containing a line of furnaces which they think will fill every requirement.

THE COPPER GOODS AND COFFEE URNS of the John Van Range Company of Cincinnati, Ohio, have kept the manufacturing in that department going at a lively rate. Some contracts for fitting out hotel and restaurant kitchens have recently been closed, and among them is one for the restaurant of one of the principal railroad depots in their city. That these contracts will be filled with the Van Steel Ranges in their most approved form is a foregone conclusion, and the carving tables, plate warmers, pastry ovens and all of the utensils for the kitchen required by the experienced chef will be supplied by the same house.

"THIS BUILDING will be heated with the Novelty furnace and the Novelty ventilated wall pipe, furnished by J. P. Schaffer, 18 Wood street, Pittsburgh," is the information imparted by a neat sign on some of the finest buildings that are now being erected in that city. The wall pipe is something new that is just being brought to the attention of the trade, though it has been tested during the past winter.

W. B. WILKINSON, manager of the New York house, 210 Water street, of the Howard Thermostat Company, Syracuse, N. Y., has established an agency for their thermostats with August Eggars of Bremen, Germany. This is evidence that the wide scope of usefulness of the thermostat is extensively appreciated.

THE PITTSTON STOVE COMPANY of Pittston, Pa., are reported to have presented to the management of the new hospital in that place one of their handsomest Model Happy Thought ranges.

JAMES LAWRENCE, bookkeeper for Sam S. Utter, 111 Beekman street, New York, has returned from a well-earned vacation of two weeks. During that time he was sojourning among the woods and pines of Greenfield Hill, Conn.

EDWARD BENEDICT, treasurer of the Thatcher Furnace Company, has just returned from the Catskill Mountains, where he has been staying at his cottage at the Twilight Park. His stay was somewhat shortened owing to an urgent telegram calling him to the Thatcher Furnace Company's foundry, at Newark, N. J., to superintend the electric light plant that is being installed. A large number of heavy orders have been received from their Western agents.

THE DETROIT STOVE WORKS recently purchased a site, 200 x 112 feet, on La Salle street near Twenty-ninth street, Chicago, on which they propose to erect a warehouse for the storage of stoves. Plans have been completed for a five-story warehouse 100 feet square, which is to be placed under contract at an early date. The outer walls will be of pressed brick, and the interior will be of mill construction, being provided with elevators and other machinery for the expeditious handling of the company's goods. The offices and sample-room will be on the first floor. The company's offices and warehouse in Chicago are located at present at 269 and 271 South Canal street. When they remove to their new quarters the company will have the most southern stove house in Chicago, the others all being considerably further north. Expansion of business, however, demands better facilities, and locations are selected with that as the main object.

THE GENTLEMEN connected with the Chicago branch of the Michigan Stove Company enjoyed most hugely the trip on Lake Michigan in Commodore M. B. Mills' yacht "Grace" on the 15th inst. The day was perfect, making a cruise on the lake very acceptable as a refuge from city heat, dirt, noise and general discomfort. In addition, however, the Commodore spread an elegant lunch, providing refreshments of all kinds, which were most thoroughly appreciated. His liberality and constant desire to make others happy were strikingly shown in this entertainment, endearing him to the Chicago attachés of his great company. The occasion was one long to be remembered by those so fortunate as to be present.

THE WROUGHT IRON RANGE COMPANY, St. Louis, Mo., have just sold an entire kitchen outfit to a large hotel at Centerville, Iowa, also a large size Home Comfort double center range to be shipped to Mansfield, Pa., and a kitchen outfit consisting of Home Comfort Range and kitchen utensils to the Royal Albion Hotel, Quebec, Canada.

WE ARE informed that the following well-known stove houses have written to the World's Fair authorities declining to have their goods examined for premium or award: Rathbone, Sard & Co., Peninsular Stove Company, Buck's Stove & Range Company, the Michigan Stove Company, the Fuller-Warren Company, Cribben, Sexton & Co., Chicago Stove Works, Wm. Resor & Co., Orr, Painter & Co., the Collins & Burgie Company, Abendroth Bros., Thomas, Roberts, Stevenson Company, Co-operative Foundry Company of Rochester, Wm. Miller Range & Furnace Company, Estate of P. D. Beckwith, Richardson & Boynton Co., The Wilcox Water Heater Co. This comprises nearly all the American stove manufacturers exhibiting at the fair.

THE MICHIGAN STOVE COMPANY, through Frederic W. Gardner, manager, have made the following very liberal proposition to President Higinbotham of the exposition: "Under our 'Mammoth-Garland' in Section O, Manufactures Building, are shown the highest cost and highest finished Garland cooking range and heating stove ever manufactured. These we propose to donate for the benefit of the families of the firemen who lost their lives in the recent disaster, and it is our desire to dispose of them by lot, delivering the goods at the close of the exposition. It is our intention to realize several thousand dollars from the sale of tickets, and if this suggestion meets with your approval we request that you send us the proper authority to allow our representative to sell consecutively numbered tickets, the proceeds of which will be promptly turned over to you."

THE STOVE foundries of Canada are all at work now, writes a Canadian correspondent. The labor troubles that paralyzed production in so many of them last year are settled. But full operation is not an unmixed good. We have too many stove makers, and when their works are all busy there is a cer-

tainty that the total output will realize but a filmy profit, which some of the concerns will not be able to offset by economy of management and soundness of accounts. Already there are rumors of weakening in some quarters. Since the dissolution of the Association of Stove Founders competition has been waged pitilessly. Some of the makers within the association had got exasperated with the cutting of outsiders and when the association broke up the outsiders had more cause for regret than the insiders had.

ONE OF THE CUSTOMERS of the Thatcher Furnace Company, New York City, writes to them concerning the durability of the Thatcher furnace, stating that a heater placed in the boys' boarding school at Westchester, N. Y., in 1856, is still doing good service. It has been in use every winter for 34 years and there has been very little expense for repairs. Mr. Harrington, the principal, states that the furnace is economical of fuel and gives entire satisfaction. This testimonial letter is being used in advertising their business by St. John & Barquist of Des Moines, Iowa, who are agents for the Thatcher furnace.

THE SYRACUSE STOVE WORKS of Syracuse, N. Y., report that during the first six months of the present year they melted 350 tons of iron more than for the corresponding period of last year, and that the quantity of stoves shipped for the period named showed an increase over that for 1892 of 200 tons. The business in repair castings for the past six months also showed a gratifying increase over that a year ago. From this increase of the manufacturing department, we understand that there was a gain in the volume of business amounting to something like $20,000. Since starting up early in the year the company have run continuously and hope to give steady employment to their force of 100 men during the remainder of the year.

THE CHICAGO & ERIE STOVE COMPANY of Erie, Pa., have introduced into their Brilliant Helper a number of improvements which are likely to prove interesting to the trade. The stove has a large circulating hot-air flue which takes the cold air from the floor and discharges it in a highly heated condition from the top, while by means of a collar and adjustable damper a hot-air pipe may be connected in such a way as to carry the heat to the floor above, thus making the stove serve as a double heater. The Brilliant Helper, which is offered to the trade this season with new base, new rails and new back, is neat in appearance, the decoration involving the use of nickeled parts, which are judiciously disposed.

THE WALKER & PRATT MFG. COMPANY of 31 and 35 Union street, Boston, Mass., are distributing several eight-page circulars relating to Walker's New World six-hole, Walker's Columbia and Walker's Crawford Grand ranges. These stoves are carefully illustrated and fully described, special reference being made to the important features of merit.

DAVID U. CORY of Englewood, N. J., has recently been granted a patent for a damper so constructed as to form a ventilating opening in a pipe or flue, and at the same time to cut off the pipe so that the gases conducted thereby cannot escape into the room. Heretofore it has been the common practice to construct furnace or stove-pipe dampers with ventilating openings above and below the damper spindle, which ports or openings were closed by segmental covers which rotated with the spindle. By this means ventilation from without to within the pipe could be effected through the opening above the damper spindle, but the gases of the flue could escape from the pipe through the opening below the damper, and the object of the invention is to obviate this and allow of ventilation while preventing the gases from flowing into the room.

Prize Competitions.

THE COMMITTEE to whom the papers in Prize Competition No. 19 were referred have awarded the prizes to the following persons:

First Prize to W. P. STEWART.
Second Prize to W. E. GILL.
Third Prize to W. F. VAN WINKLE.

Export Notes.

A reliable firm of exporters, who ask no credit, recently had in hand orders for about 12 carloads of Galvanized Sheet Iron, suitable for roof tiling, which is coming more and more into use in Spanish America. The greater portion of this is still unplaced.

One of the aggravations of export merchants is to write a manufacturer for quotations on specific goods and quantities, and have him answer in two or three different communications he does not see how he can compete in his line with foreigners. If the house ordering understand their business it is not necessary for him to see it. That part of the transaction they have been studying both in this and foreign markets, while the manufacturer has mainly confined himself to producing goods. Many conditions have recently changed in this respect. An instance applicable to many cases came to our notice lately. A mill rolling metal for sheathing, out West, sent out not long ago a sample lot, which, proving satisfactory, was quickly followed by a second requisition equal to the amount of the first multiplied by itself, aggregating about $1000, with the prospect of an increasing business. This opportunity was missed by a concern too cautious to try, where very little was involved in the experiment.

There is a company in this city who have shipped 1000 tons of Sheet Metal since January 1, 1893, to a market that has been open to us on these goods but a year, and which was formerly supplied largely from Great Britain.

A good story illustrative of the merit of some American goods in European markets is told by a merchant who has for years placed large quantities of our products in great Britain. An English manufacturer of Pumps gave an order for a sample lot of W. & B. Douglas' goods some years ago, which was executed, and, be it said, was the only order given. Within a comparatively short time those identical goods were duplicated by him, but stamped "Colonial," on which a large local as well as Australian, &c, trade has been built, the trade continuing at the present time. Benjamin Douglas being in England some time after drifted into an agricultural fair in one of the towns and was attracted by an exhibit of Pumps, which proved to be identical with the "Colonial" pattern, but the closest scrutiny failed to discover the trade name under which the goods were being sold. His suspicions being aroused he became more critical and finally discovered where the "W. & B. Douglas" cast in the goods had been removed and the Pumps refinished. Mr. Douglas' remark to his agent was that it was revenge enough for him, partially reconciling him to loss of considerable trade, that an English maker was exhibiting his (W. & B. Douglas') goods for the purpose of capturing a medal at a county fair.

A Novel Profession.

The host of labor disputes which have marked the past few years in England, and the great loss and inconvenience attendant upon strikes, have caused the evolution of a new profession in that country. There has arisen a class of leaders men, termed "strike defeaters," whose business is that of breaking down strikes, not by physical or military force, but by the more peaceful method of doing the work of the strikers until they come to terms. One of the most prominent of these individuals, whose name is Graeme Hunter, is described as a powerful, energetic man in mind and body, who lives with his men, but rules them with strict discipline. His methods are in some respects peculiar, and appear slightly arbitrary to an American mind. As described by English journals, Mr. Hunter's system is as follows: He has the reputation of never interfering in a strike until all means of settling it have been exhausted and he believes the strikers to be in the wrong. Then he simply puts his men to work and keeps them at it. He tells his hands how much he gets to do the job, and the way he makes his own remuneration is by simply dividing the whole amount among them according to their labor, less 1 penny out of every 5 shillings they earn, over and above the expenses incurred. He has under his control some 3200 men, whose average wages are about $6 a week, besides board and lodging. They are all obliged to live together near to where they may be working, and Mr. Hunter insists on every married man sending home at least £1 a week to his wife, paying them this amount in postal orders, collectible at the home of the wife. Fines are exacted far the absence from work, &c., and no recognition of union rules is had. It is said that eight of his gangs were recently employed at eight ports, including Liverpool, Glasgow, Greenock, Dublin and Bristol, by which it would seem that these men are all-round laborers and not skilled workers.

Gas consumers often complain that books, furniture and pictures are injured by the small quantity of sulphur which, despite all precautions, passes through the burners. But, says a London gas journal, Dr. Odling, F.R.S., and Professor Lewis, two British experts, in giving evidence before a committee on the Crystal Palace Gas bill, declared that this idea was an error. The damage was not due to the sulphur, but to the heated zone of the atmosphere above the chandelier. Dr. Odling produced a sulphur candle such as is used for disinfecting purposes, and this he observed would exercise no injurious effects upon furniture. When, however, it was suggested that it should be lighted in the committee room in order that members might appreciate its effect the idea was not taken up with scientific eagerness.

TRADE REPORT.

The Iron Market.

From all parts of the country come the reports of stagnation in the Iron business, and evidence is not wanting that even with the heavy restriction in production the supply overbalances the demand. Forced sales occasionally crop up, and low prices might be more frequently made if there were buyers able and willing to grant favorable terms of payment.

That there are those who have the courage to contract heavily in these critical times is proved by the fact that a Chicago implement manufacturer has bought from a leading Pittsburgh mill 28,000 tons of Steel Bars, for a year's delivery. Other implement makers have also bought or are negotiating.

The restriction in the make of Pig Iron is proceeding, and four large Pittsburgh furnaces are to be added soon to the idle stacks.

There seems no immediate chance for a settlement of the wages scale. The logic of events is decidedly against the men, who have declined to make any concessions on finishing applicable to the great majority of the Western mills. A sliding scale which slides only down to a 2-cent basis for Bars, when the actual selling price is 1.40¢, is a farce.

Pig Iron.—In New York the market is very dull, but for standard brands prices are well maintained. We quote Northern brands at $14.50 @ $15 for No. 1; $13.75 @ $14.50 for No. 2; $12.25 @ $12.50 for Gray Forge, at tidewater. Southern Iron, same delivery, $13.75 @ $14.50 for No. 1; $12.50 @ $13.50 for No. 2; $12 @ $12.25 for No. 3; $12.25 @ $12.50 for No. 2 Soft, and $12.75 @ $13.25 for No. 1 Soft. Gray Forge remains $11.75 @ $12.50.

The Philadelphia market is reported as dull, and while there is no great pressure to sell, the outlook is far from encouraging. The severe curtailment of production obviates any serious accumulation of stocks, which is probably the only thing that could be done to avoid disaster. The supply of good Iron is not large and prices are steady, with little chance of their going any lower. Meanwhile the demand is for small lots, for which prices are as near the figures quoted below as circumstances will permit, although for spot cash concessions of 50¢ ℔ ton have been made, and in some cases still heavier concessions have been met with, particularly on secondary qualities of Iron. Ordinarily, however, asking prices for Philadelphia and near-by points are about as follows:

American Scotch, No. 1X	$16.00	@	$16.50
American Scotch, No. 2X	15.00	@	15.50
Standard Penna. (Lake Ore), No. 1x	15.00	@	15.50
Standard Penna. (Lake Ore), No. 2x	14.00	@	14.50

The Pittsburgh Market is at a standstill. Although production shows a large falling off consumption has at the same time declined to even greater proportions and the outlook is regarded as very unpromising. Prices have, nevertheless, been fairly steady, although a good order placed now might shade the lower quotation. Quotations are as follows:

No. 1 Foundry	13 50	@	13.75 "
No. 2 Foundry	12.50	@	12.75 "
Charcoal Foundry No. 1	17.00	@	18.00 "
Charcoal Foundry No. 2	16.50	@	17.00 "

Chicago advices report an equally dull trade. Very little Iron is being shipped from furnaces to consumers, showing that consumption has dwindled to almost nothing. Inquiries are light, and negotiations which seemed quite promising a week ago are not materializing. Conditions have grown worse instead of better, and there seems to be no early prospect of an improvement. The following quotations are conditioned as the nearest obtainable expression of values, but they would be shaded in case of actual transactions:

Lake Superior Charcoal	$16.00	@	$16.25
Local Coke Foundry, No. 1	13.50	@	14.00
Local Coke Foundry, No. 2	12.75	@	13.00
Local Coke Foundry, No. 3	12.50	@	12.75
Local Scotch	14.00	@	15.00
Ohio Strong Softeners	15.75	@	16.25
Southern Silvery, No. 1		@	14.50
Southern Silvery, No. 2		@	14.00
Southern Coke, No. 2	12.75	@	13.00
Southern Coke, No. 3	12.25	@	12.50
Southern, No. 1, Soft	12.65	@	13.00
Southern, No. 2, Soft	12.25	@	12.50
Southern Gray Forge	11.50	@	12.00
Tennessee Charcoal, No. 1	16.50	@	17.00
Alabama Car Wheel		@	18.85
Coke Bessemer	14.50	@	15.00
Hocking Valley, No. 1	16 75	@	17.00
Jackson County Silvery	16.75	@	17.00

There has been a restricted volume of business in Pig Iron during the week in Southern markets, and no relief from the prevailing financial stringency has yet been experienced. The market is generally so demoralized that nearly every transaction has an independent basis, and it may be assumed that where the cash is in sight it brings the Iron at the lowest prices. There have been sales during the week, mainly in single car lots locally delivered, and nearly all kinds of Iron were taken, except Standard Charcoal Iron. Quotations as follow nearly represent the current rates prevailing on Southern Pig Iron:

Foundry.

Southern Coke, No. 1	$12.75	@	$13.00
Southern Coke, No. 2	11.25	@	11.50
Southern Coke No. 3	10.75	@	11.00
Ohio Soft Stone Coal, No. 1	15.50	@	16.00
Ohio Soft Stone Coal, No. 2	14.50	@	14.75
Lake Superior Coke No. 1	15.00	@	15.25
Lake Superior Coke No. 2	14.00	@	14.25
Hanging Rock Charcoal, No. 1	18.50	@	19.00
Hanging Rock Charcoal, No. 2	17.50	@	18.00
Tennessee and Alabama Charcoal, No. 1	14.75	@	15.00
Tennessee and Alabama Charcoal, No. 2	13.75	@	14.00

Forge.

Gray Forge	10.25	@	10.50
Mottled Coke	10.25	@	10.50

Car Wheel and Malleable Irons.

Standard Southern Car Wheel	16.75	@	18.00
Lake Superior Car Wheel and Malleable	17.25	@	17.50

Metal Market.

Pig Tin.—Speculation has been on a smaller scale, and the market has shown weaker tone in the face of steady reduction in the stocks here. General financial uncertainty has a more or less unfavorable bearing and offsets what strata of strong feature there may be in the position of the market. Prices have dropped to 18.75¢ for spot delivery, 18.90¢ for August, and 19.30¢ for September, a decline of over ¼¢ ℔ lb during the week. Upon the whole the market shows a weakness which clearly indicates that best efforts to sustain prices are offset by the financial depression which prevents unloading of the usual amount of Tin from first hands into the channels of distribution and consumption. Consumption, too, has been undoubtedly checked under the same influences to a considerable extent.

Copper.—The market has remained very quiet, and is bare of distinctly new features, except that it seems easier to buy at prices that looked exceptionally low last week. Demand from home consumers does not improve perceptibly, and, if anything, the market is showing a rather weaker tone. Current quotations are about 10¼¢ for Lake Superior Ingot, although bids for a fraction less were made on the exchange, and an offer of 10.15¢ for September delivery found no takers. Electrolytic, 10¢; Common Casting stock, 9¾¢ @ 9⅞¢.

Pig Lead.—Under continued pressure to sell prompt and near future delivery, prices have declined still further and the market remains in very unsettled condition. Early in the week several hundred tons were sold at 3.50¢, moderate quantities went subsequently at 3.45¢, and finally some good-sized lots at 3.40¢.

Spelter.—Slow demand, along with continued pressure to sell, have caused a further decline in prices and the market remains in very weak condition. Ordinary brands of Western were sold

at 3.95¢ @ 4¢, in carload lots, and those figures reflect full market value at the present time.

Antimony.—There is only a moderate inquiry and prices are barely steady at 9¾¢ @ 9⅞¢ for Hallett's, 10⅛¢ @ 10¼¢ for L X, and 10⅜¢ @ 10½¢ for Cookson's, on the spot.

Tin Plate.—The demand has shown little, if any, improvement and the tone of the market for both spot stock and future deliveries continues rather weak, with concession from the prices generally quoted not infrequent. In Ternes there is, however, some little movement noted, owing to requirements of the building and roofing trades, but orders are usually for limited quantities, no one being apparently desirous of laying down any considerable stock under present uncertain conditions in regard to financial and tariff legislation. The bulk of the demand for roofing Tin will, it is thought, set in a month or two later; and a good fall business in this line is generally anticipated. For Bright Plates the immediate demand is next to nothing. Stocks are large and the assortment full in both imported and domestic material, and cash orders would likely meet with some shading of the prices generally asked.

Chicago Report.

Scrap.—The following buying prices are still quoted by some dealers, but most of them are refusing to take in any stock, because consumers are doing nothing:

	Per net ton.	Per lb
No. 1 Wrought Scrap	$10.00	....
Machinery Cast	7.50	....
Malleable Cast	7.00	....
Stove Plate (free of burnt)	5.00	....
Burnt Iron and Grate Bars	4.00	....
Sheet Iron and Hoops	3.00	....
Plow Steel and Breaking Stock	6.00	....
No. 2, such as Shovels, Hoes, &c	4.50	....
Old Boilers—whole (Iron)	6.00	....
" (Iron)—cut in single Sheets and Rings	9.00	....
Old Gas-Pipe and Boiler Tubes	6.00	....
Cast Borings	3.50	....
Turnings	5.00	....
Horseshoes	10.00	....
Copper Bottoms	....	7 ¢
Copper Clips and Heavy	....	8⅛¢
Heavy Brass	....	7⅛¢
Light Brass	....	4 ¢
Pipe Lead	....	3 ¢
Tea Lead	....	2½¢
Zinc	....	2¾¢
Rubber	....	2¾¢

Anthracite.—Trade is still extremly dull. Dealers quote carload lots of 12 net tons as follows:

	Grate.	Egg, Sto. and Ch.
Chicago, Ill	$5.85	$6.10
Milwaukee, Wis	5.85	6.10
Kansas City, Mo	9.05	9.30
Council Bluffs, Iowa	9.05	9.30
Lincoln, Neb	9.20	9.45
Sioux City, Iowa	9.05	9.30
Aberdeen, S. Dak	9.10	9.35
Dubuque, Iowa	7.15	7.40
Madison, Wis	7.35	7.60
St. Paul, Minn	8.35	8.60
Burlington, Iowa	7.35	7.60
Des Moines, Iowa	8.80	9.05
Davenport, Iowa	7.15	7.40
St. Joseph, Mo	9.05	9.30
Leavenworth, Kan	9.05	9.30
Omaha, Neb	9.05	9 30

Colorado Anthracite.

COLORADO FUEL & IRON COMPANY.

Denver	$8.00
Pueblo	8.00
Colorado Springs	8.00
Leadville	8.00
Cheyenne, Wyo	10.00
All points between Denver and Missouri River	9.35

CONDITION OF THE

Hardware Trade.

THE INACTIVITY IN BUSINESS which has prevailed since the opening of the month still continues and the volume of trade is small. Jobbers are refraining from pressing sales, and are scrutinizing credits carefully. They are also deferring the placing of their usual orders, and in some cases where their orders have been booked have recently been writing to the factories countermanding portions of the orders or postponing shipments for a few weeks. They are thus evincing a disposition to await the developments of the market, their principal attention being given to collections and financial matters. Manufacturers are pursuing a similar course, and while in many cases curtailing production and carefully avoiding the accumulation of goods, are generally conservative in the marketing of their products and maintaining prices pretty well. In some cases, however, concessions have been made, for the most part, it is thought, under the pressure of financial necessity, in order to realize upon goods in stock. The close prices which have been prevailing on most lines of Hardware prevent the manufacturers, however, from lowering their quotations without incurring actual loss. Retailers also are feeling the stringency in the money market and diminished sales in some sections, owing to the closing of shops and factories, and are buying very sparingly, their orders covering limited assortments of goods of which they are in need. In the present condition of things the trade, both wholesale and retail, are apparently pursuing the policy of keeping their stocks as low as possible, expecting to place their orders when the fall demand sets in. They are thus relying upon the manufacturers to carry the stocks of goods to a greater extent than usual, while the manufacturers, as noted above, are prudently endeavoring to avoid an undue accumulation. The result of this policy will be the production of a considerably smaller quantity of goods than is usual, and if a considerable demand should suddenly set in something of a scarcity might occur. The trade, however, prefer to take their chances in this matter rather than load up with goods, in the payment for which and subsequent sales they might experience some difficulty. Collections are difficult and only houses who are in an especially favorable condition are availing themselves of cash discounts. There are, however, some indications of improvements in the matter of remittances.

Advices from Chicago.—The condition of the Hardware trade remains about as stated last week, with trade stagnant but collections steadily working into better shape. Jobbers are reducing expenses in every direction, and are doing very little to force trade, as they are of the impression that it is advisable now to sell only to those who are in need of stock and are able to pay for it. The failure of Parkhurst & Wilkinson of this city, which occurred on Monday, takes down one of the largest and oldest Heavy Hardware houses in the Northwest, whose name has been respected throughout the trade and is synonymous with fair dealing and honest goods. They have the sympathy of the entire trade in the misfortune which has befallen them. Their early resumption is expected, as it seems unreasonable that they will not be able to effect some arrangement with their creditors.

Notes on Prices.

Cut Nails.—Some of the Cut-Nail mills are still in operation, though working on short time and with considerably diminished output. Others, and among them some of the leading ones, are shut down. An accumulation of stock is thus avoided, though there is no difficulty in having orders promptly filled. Prices are pretty well maintained on substantially the same basis as for the past few weeks, namely, $1.05 for carload lots at mill, a figure which is shaded for Iron Nails, and also in some special cases on Steel Nails. Small lots from store in New York are quoted at $1.30. The demand is sluggish and the volume of business small.

Advices from Chicago.—The Steel-Nail factories are still closed, but there appears to be no difficulty in supplying the trade with all the Nails wanted from stocks carried over in their warehouses. The demand is of such a character that most of it runs to less than carloads. Prices from factory are unchanged at $1.20 to $1.25 and from store at $1.25 to $1.30, according to quantity.

Wire Nails.—Notwithstanding the fact that the mills have been closed during the month, there is no difficulty in the trade obtaining such Nails as they require, even though it is understood that the stocks in manufacturers' hands are not heavy. Quotations are more evenly maintained than for some time past at $1.35 for carload lots at mill, and the manufacturers are indisposed to shade this price. The question as to what can be done by the manufacturers to give regularity to the market is receiving attention, and some of the manufacturers express confidence that something may be accomplished in this direction. The present unsettled con-

dition of things in the market at large, and the fact that business of late under the very active competition which has existed has been decidedly unsatisfactory, have their influence in overcoming some of the objections which have been entertained by some of the prominent manufacturers to such an arrangement. While nothing definite has as yet been consummated it is regarded as more probable than heretofore that some satisfactory conclusion may be reached, notwithstanding the fact that serious difficulties still remain.

Advices from Chicago.—The only demand experienced by manufacturers is for shipments of carloads to scattered buyers throughout the country, the demand generally being extremely light. Stocks are reported low in manufacturers' hands, consisting of only about 100,000 kegs, and they are buying from each other, but so trifling is the demand at present that such a stock would seem to fill their requirements for weeks to come. The manufacturers held a meeting last Wednesday and hold another this week to endeavor to perfect a plan to improve the condition of the Wire-Nail trade. All are interested except the Carnegie Steel Company, and the prospects are reported bright for an agreement upon the limitation of output to the exact wants of the country. The manufacturers express themselves as being so disheartened over results of the past three months that they are ready to unite with one another upon any reasonable basis which may promise to relieve the situation. The factory price is unchanged from $1.45 Chicago, while small lots are selling from stock at $1.55 to $1.60, according to quantity.

Barb Wire.—The Barb-Wire market is stagnant. Quotations remain as before at $2.45 to $2.50 for carload lots of Four-Point Galvanized, at mill. Small lots from store are held at the usual advance.

Advices from Chicago.—Trade in this line is absolutely neglected. Hardly a transaction is heard of in any direction. Prices are unchanged at $2.10 for carload lots of Painted, and $2.50 for Galvanized, while small lots from jobbers' stocks are quoted at $2.30 and $2.70 respectively.

Oil Cans.—Youngstown Stamping Company, Youngstown, Ohio, are selling their Galvanized Blue Band and Glass Oil Cans at the following prices:

	Per dozen.
Galvanized Blue Band Can, 5 gallon, Tip-Top	$12.00
Galvanized Blue Band Can, 5 gallon, Faucet	8.00
Galvanized Blue Band Can, 1 gallon.	2.25
Friend Glass Oil Can	2.75

Blocks.—The Cleveland Block Company, Cleveland, Ohio, have reduced the price of their Blocks, their present quotations being represented by discount 60 to 60 and 10 per cent. They also advise us that they have decided not to adopt a soft-steel shell for their Blocks, though somewhat less expensive, referring to the rope as liable to cut through it, leaving a sharp edge, which is not the case with their malleable shells.

Glass.—As is usual with the Glass market at this season trade is quiet and there have been no changes either in demand or prices since our last report. Meetings of the National Glass Company and the Glass workers were held last week, the manufacturers meeting in Chicago and the workers in New York, at which the questions relating to scale were discussed at some length. Committees representing the manufacturers and their employees will soon come together, but the date has not yet been definitely determined. A meeting of the stockholders of the National Glass Company was held in Chicago on July 25, at which a statement was presented outlining the work of the company during the fire just closed. The plant of the Pennsylvania Plate Glass Company has resumed operations, but it is not thought likely that this action on their part will induce other concerns to follow their example. The company are paying former rates, having failed to effect the 10 per cent. reduction in wages which they contemplated. The slight improvement in demand for imported Glass noted last week continues, and we understand that a few large orders have been placed. Quotations on Glass remain unchanged, as follows: American Window Glass, 2000 boxes at one time, 80 and 10 and 10 per cent. discount; carloads, 400 boxes, 80 and 15 per cent. discount; less quantities than carloads, 80 and 10 per cent. discount. Freight allowed on car lots and over, not to exceed 17½ cents per 100 pounds; less than car lots, f.o.b. at shipping point. French Window Glass, 75 and 10 and 5 per cent. discount. American Plate ranges in price from 50 and 10 and 7½ per cent. discount to 60 and 5 per cent. discount. Imported Plate Glass, 60 per cent. discount to 60 and 10 and 5 per cent. discount.

Old Rubber.—Prices are fairly well maintained at present rates, with a minimum amount of business doing. The following are the prices paid for Old Rubber delivered in New York, except as otherwise stated:

Car Springs, ton lots, ℔ lb.	@	$0.03¼
Rubber Shoes, carloads, delivered at factory, ℔ lb.	@	.03⅛
Rubber shoes, less than carloads	@	.03
Large Hose, ℔ ton	@	9.00
White Wringer Rolls, ℔ lb.	@	.04¼
White Wringer Rolls, good grade	@	.05
White Syringes, ℔ lb.	@	.05

Old Rags, Paper, &c.—Business in this line is practically at a standstill, no one knowing exactly what to do. Buyers seem to be holding out for lower prices, while sellers, where able, seem to prefer holding on for more favorable rates. As many Paper mills have shut down, or are running on reduced time, there is naturally not the demand there has been. Many dealers who usually carry stocks to meet a demand are not buying, on account of inability to sell promptly. The following are the current prices quoted for Old Rags, Paper, &c., delivered in New York:

No. 1 White Rags	℔ lb 3	@ 3⅛¢
No. 2 White Rags	℔ lb 2	@ 2⅛¢
Mixed Rags	℔ lb	1¼¢
Blues and 3ds	℔ lb	1¼¢
Hard Sized White Shavings	℔ lb	2⅜¢
No. 1 White Book Shavings	℔ lb 2¼	@ 2⅜¢
No. 2 White Book Shavings	℔ lb 1½	@ 1⅝¢
Light Book Shavings	℔ lb ⅞	@ 1¢
No. 1 Mixed Shavings	℔ lb	1¢
No. 2 Mixed Shavings	℔ lb	⅝¢
No. 1 Printed Books	℔ lb 1	@ 1¼¢
Ordinary Mixed Books	℔ lb ½	@ ¾¢
Newspapers	℔ lb	⅝¢
No. 1 Manila Paper	℔ lb 1¼	@ 1¼¢
No. 2 Manila Paper	℔ lb ⅞	@ 1 ¢
Bogus Paper	℔ lb ⅝	@ ¾¢
Common Paper	℔ lb ¾	@ ⅞¢
Straw Chips	℔ lb ½	@ ⅝¢
Binders' Clippings	℔ lb ½	@ ⅝¢
Jute Butts	℔ lb	1¼¢
No. 1 Jute Bagging	℔ lb 1¼	@ 1⅜¢
Mixed Bagging	℔ lb	1¢
No. 2 Bagging	℔ lb	¾¢
Hemp Twine	℔ lb	2¼¢
Manilla Rope	℔ lb	2¼¢
Jute Rope	℔ lb 1½	@ 1⅝¢
Mixed Rope	℔ lb ¾	@ ⅞¢

Old Metals.—The trade in this class of goods is almost at a standstill, many dealers preferring their goods to an account. As for prices, it often depends on how badly a dealer wants to buy or sell what basis is determined on to close a transaction. Some are doing next to nothing, preferring to sit still and await developments. The following are fair quotations now current for Old Metals in New York, subject to the conditions stated:

Heavy Copper	℔ lb 9½¢
Light and Tinned Copper	℔ lb 8½¢
Heavy Brass	℔ lb 7¢
Light Brass	℔ lb 6¢
Lead	℔ lb 3½¢
Tea Lead	℔ lb 3½¢
Zinc	℔ lb 2¾¢
No. 1 Pewter	℔ lb 14¢
No. 2 Pewter	℔ lb 7¢
Wrought Scrap Iron	℔ gross ton, $13.00
Heavy Cast Scrap	℔ gross ton, 9.00
Stove Plate Scrap	℔ gross ton, 6.00
Burnt Iron	℔ gross ton, 4.00
Mixed Bagging	℔ lb 1 ¢
No. 2 Bagging	℔ lb ¾¢
Hemp Twine	℔ lb 2½¢
Manila Rope	℔ lb 2¼¢
Jute Rope	℔ lb 1⅞ @ 2 ¢
Mixed Rope	℔ lb ¾ @ ⅞¢

Trade Notes.

THE WILLER MFG. COMPANY of Milwaukee, Wis., have issued an advertising sheet showing a general view of the Marion High School building at Marion, Ind., which is furnished throughout with the Willer Sliding Blinds. Below the picture of the building are photographic copies of the letters received from the president of the school board at Marion, Ind., and also from the contractors and architect of the building.

THE MICA MFG. COMPANY (John O'Neill, proprietor), 89 Fulton street, New York, issue a little pamphlet of a size convenient to carry in the pocket, relating to Mica, Mica goods and specialties. Attention is invited to the line of Mica Protectors for Lamp Shades, which are made in several sizes and adapted for all kinds of shades. All the canopies, except smoke bells,

have screw tops, which, the company state, render them more durable The little pamphlet is illustrated, showing the appearance of the various Mica specialties manufactured, while tables give the retail prices of Mica by the sheet.

BLESS & DRAKE, Newark, N. J., make a specialty of the manufacture of Sad Irons in great variety and tailors' Geese. Their leader is the Ideal Sad Iron with a detachable wood handle. Self-heating smoothing and tailors' irons are made in several patterns. In 24 hours pig iron is changed into the finished product and ready for shipment, several tons being used daily and about 100 men are employed. Grindstones weighing 2 tons and 6 feet in diameter, with a 12-inch face, are run at a high speed for grinding, while the polishing is done by fine emery or special wheels.

ILLINOIS ROOFING & SUPPLY COMPANY, 203 Lake street, Chicago, make a prominent announcement elsewhere in this issue directing attention to the Perfection folded lock-seam steel roofing, the advantages of which they note. They guarantee the roof and request that it be returned at their expense if not found as represented. They also refer to "E. L." roofing tin, which they describe as an American coated terne of full Worcester grade.

"THE HUSTLER" is the title of a publication sent us by the National Cash Register Company, Dayton, Ohio. It is a very elaborate trade circular, the front page being printed in colors with very handsome effect. The back of the circular gives a bird's-eye view of the factory of the company, together with views of several of their registers, and the interior pages contain the names of many people using these devices. The circular comes to us with the compliments of E. D. Gibbs, the advertising editor of the company.

POWERS BROTHERS, Streator, Ill., are meeting with an excellent demand for Powers' Patent Automatic Chimney Top of their manufacture. They are selling these largely to the jobbers and hardware dealers, and particularly note that the tops are put up in a very compact manner, so that dealers can carry them in stock without taking up much room. The iron mountings are packed six sets complete, with patterns for making the cover and vane, in wood boxes about 10 inches square. The iron mountings are made so that there is only one bearing and all the friction is next the cover, while there is a brace at the bottom of the cover to hold it in position and keep it from rubbing against the stack or becoming loose.

LALANCE & GROSJEAN MFG. COMPANY, New York, closed down their factory at Woodhaven, L. I., for the current week on account of the dullness of trade and the large stock of finished goods on hand, as well as for the purpose of making certain repairs and a general overhaul. The factory will resume operations next Monday, closing down again for the following week, subsequent to which the company propose running the works right along, as usual, should the condition of business justify them in doing so. This arrangement has been made out of consideration for the workpeople in order that they may not be without wages for two consecutive weeks.

THE PLANT of the W. Dewees Wood Company at McKeesport, Pa., manufacturers of patent planished sheet iron, which has been undergoing repairs since June 30, has resumed operations in all departments.

THE FIRM OF C. C. CLAPPER & CO., Zanesville, Ohio, dealers in Hardware, Harness and Buggies, has been dissolved. C. C. Clapper will continue the business at the old stand.

C. S. OSBORNE & Co. of Newark, N. J., exhibit, at the World's Fair, Chicago, two large showcases, filled with specimens of their Standard Saddle and Harness Tools, beautifully nickel plated. All kinds of tools are shown which are used in the saddlery and harness trade, including Cutlery, Marking Tools, Punches, Rosette Punches, Pincers, Eyelet Machines, Hammers, Screw Drivers, &c. They also exhibit specimens of their Upholsterers' Tools, Nut Cracks, Gas Pliers and miscellaneous tools. Evidently as much care has been taken in finishing the handles of these tools as in making the tools themselves. The display is exceedingly creditable throughout.

MATTHAI, INGRAM & Co., Baltimore, Md., have completed a new department for galvanizing and an additional fire-proof building for retinning, which will give them facilities, they advise us, equal to any concern in the country. They will soon occupy the structure built on the site of their fire in march, and expect to add new lines of desirable goods.

A LINE of stamped and pieced tinware made out of the Dunlap double dipped tin-plate, which includes several specialties, makes the John Dunlap Company of Pittsburgh one of their own customers for their own production of bright tin plate, while the trade at large are making increased demand for both bright and roofing plates.

MAHER & FLOCKHART, Newark, N. J., who do a general foundry business, have recently added to their plant a new cupola from the Detroit Foundry Equipment Company, Detroit, Mich.

THE DETROIT FOUNDRY EQUIPMENT COMPANY, Detroit, Mich., have opened an office in New York at 182 Front street, in charge of J. Gilmour, who has had experience as a foundry superintendent with the Pittsburgh Locomotive Company and with Uzal Cory & Co.

F. A. SMITH is making a few days' stay in New York looking after the interests of the Wm. H. Page Boiler Company of Norwich, Conn., among the dealers in steam and hot-water apparatus in this vicinity.

THE NIAGARA RADIATOR COMPANY have been organized with a capital of $120,000, and may locate a plant for the manufacture of radiators at Tonawanda, N. Y.

There lives a "carpenter" we wot of, says an English exchange, not 100 miles from London, who announces that he "repairs locks, lamps, and furniture," does "soldering, plumbing, glazing, and coppersmiths' work," "mounts and finishes in any design repoussé brass-work," "grinds by new and improved machinery scissors, knives and forks," "repairs and enamels cycles," "takes inventories," and sells "oils for burning and lubricating." This is, we should say, a *bonâ fide* Jack-of-all-trades. Where do the other tradesmen come in?

The telephone is now being used by divers. While at the bottom of the water they can thus communicate with those in charge of the apparatus above, and receive instructions as the work proceeds.

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CHICAGO, JULY 27, 1893.

Tin—

Straits pigs.....22¢

Imported Tin Plates—

Charcoal Plates.—Bright.

Guaranteed Plates command special prices, according to quality.

		Per box.
Calland and Melyn Grade	IC, 10 x 14	@ $6.75
	IC, 12 x 12	@ 6.75
	IC, 14 x 20	@ 6.75
	IC, 20 x 28	@ 13.50
	IX, 10 x 14	@ 8.75
	IX, 12 x 12	@ 8.75
	IX, 14 x 20	@ 8.75
	IX, 20 x 28	@ 17.50
	DC, 12½ x 17	@ 8.50
	DX, 12½ x 17	@ 8.50
Allaway Grade,	IC, 10 x 14	@ 6.50
"	IC, 12 x 12	@ 6.50
"	IC, 14 x 20	@ 6.50
"	IC, 20 x 28	@ 13.00
"	IX, 14 x 20	@ 8.00
"	IX, 20 x 28	@ 16.00

Coke Plates—Bright.

	Per box.
Steel Coke—IC, 10x14.14x20.	@$5.85 @$6.00
IC, 14x20.90 ℔	@ 5.75
IC, 14x20, 100 ℔	@ 5.85
10 x 20	8.75 @ 9.00
20 x 28	11.70 @12.00
X, 10x14, 14 x 20	@ 7.50
B.V. Grade. IC, 10x14, 14x20.	5.85@ 6.00

Charcoal Plates.—Terne.

Guaranteed Plates command special prices, according to quality.

Mansel and Dean Grades.—

IC. 14 x 20	@ $5.62½
20 x 28	@ 11.25
IX. 20 x 28	@ 14.25

Worcester Brand and equal.—

IC, 14 x 20	6.12½@
IC, 20 x 28	12.25 @
IX, 14 x 20	7.62½@
20 x 28	15.25 @

American Tin Plates.

Charcoal Plates.—Bright.

Irondale, A. A.—IC, 14 x 20	$7.00
" " IX, 14 x 20	9.00
" " IXX, 14 x 20	11.00
" " IC, 20 x 28	14.00
" " IX, 20 x 28	18.00
" " IXX, 20 x 28	22 00

Florence.—

IC, 10 x 14, 12 x 12, 14 x 20	$6.75
IX, 10 x 14, 12 x 12, 14 x 20	8.75

Palma.—

IC, 10 x 14, 12 x 12, 14 x 20	$7.50
IX, 10 x 14, 12 x 12, 14 x 20	9.50

Each extra cross $2.00 and 20 x 28 double these prices.

Brilliant, Tissue Packed, IC, 14 x 20	$9.25
Royal, extra, IC, 14 x 20	7.25
Merion, IC, 14 x 20	7.00
Almond, IC, 14 x 20	6.50
Mint, IC, 14 x 20	6.25

Coke Plates.—Bright.

Elwood.—IC, 14 x 20	$6.00
" IC, 20 x 28	12.50

Roofing Plates.

Arch (205 ℔), 20 x 28	@$11.75
Palm (205 ℔), 20 x 28	@ 12.25
Crescent, IC, 20 x 28	@ 12.50
Crescent, IX, 20 x 28	@ 15.75
Empire, IC, 20 x 28	@12 75
" IX, 20 x 28	@16.00
Hickory, IC, 20 x 28	@ 13.00
" IX, 20 x 28	@ 16.10
Alaska (heavily coated), IC, 20x28	@$14.50
Alaska IX, 20 x 28	@ 17.75
Special, IC, 20 x 28	@ 15.00
" IX, 20 x 28	@ 18.25
Merchant's Roofing (extra coated), IC, 20 x 28	@$17.75
Merchant's Roofing (extra coated), IX, 20 x 28	@$21.50
Merchant's Old Method, (extra heavily coated), IC, 20 x 28	@$19.75
Merchant's Old Method (extra heavily coated), IX, 20 x 28	$23.60
Irondale A:	
IC, 14 x 20	$6.25
IX, 14 x 20	7.75
IC, 20 x 28	12.50
IX, 20 x 28	15.50
Westmoreland:	
IC, 14 x 20	$6.25
IC, 20 x 28	12.50
Elwood:	
IC, 20 x 28	$12 00
Juno:	
IC, 14 x 20	$5.75
IC, 20 x 28	11.50
Scott's Extra Coated, Stamped and Resquared, IC, 14 x 20	$9.50
Scott's Extra Coated, Stamped and Resquared, IX, 14 x 20	11.00
Scott's Extra Coated, Stamped and Resquared, IC, 20 x 28	19.00
Scott's Extra Coated, Stamped and Resquared, IX, 20 x 28	22.00
Neville, Stamped, IC, 14 x 20	6.25
" " IX, 14 x 20	7.50
" " IC, 20 x 28	12.50
" " IX, 20 x 28	15.00
Taylor's Old Style, IC, 14 x 20 (Stamped and Resquared)	$9.50
Taylor's Old Style, IC, 20 x 28 (Stamped and Resquared)	19.00
Taylor's Roofing, IC, 14 x 20 (Stamped and Resquared)	8.25
Taylor's Roofing, IC, 20 x 28 (Stamped and Resquared)	16.50
Columbia, IC, 14 x 20 (Stamped)	7.25
" IC, 20 x 28 (Stamped)	14.50
Maple, IC, 14 x 20 (Stamped)	6.75
" IC, 20 x 28 (Stamped)	13.50
Willow, IC, 14 x 20	6.50
" IC, 20 x 28	13.00
Knoxall, IC, 14 x 20	6.25
" IC, 20 x 28	12.50
Globe, IC, 14 x 20	6.00
" IC, 20 x 28	12.00
Miami, IC, 14 x 20	6.00
" IC, 20 x 28	12.00
" IX, 20 x 28	15.00
" (Redipped), IC, 20 x 28	17.00

Tin Boiler Plates.

	Per box of 100 sheets.	Per box of 112 sheets.
X, 14 x 28	$13.00	$13.00
XX, 14 x 28	14.50	14.50
X, 14 x 31	14.50	15.80
XX, 14 x 31	16.50	17.50
X, 14 x 56	29.50	16.50
XX, 14 x 56	32.50	18.20
X, 14 x 60	31.50	17.65
XX, 14 x 60	35.50	20.90

Sheet Iron—

Black.

	Common American	Refined.
Nos. 10 to 16	℔ 2 7-10¢	3 3-10¢
17 to 20	℔ 2 8-10¢	3 4 10¢
21 to 24	℔ 2 9-10¢	3½¢
25 and 26	℔ 3¢	3 6-10¢
27	℔ 3 1-10¢	3 7-10¢

Russia, Planished, &c.

Genuine Russia, all numbers....13¢ net.
Patent Planished....℔ A, 10½¢; B, 9½¢ dis. 5%

Galvanized.

List on following page.
Juniata or first quality.....dis. 70&5%

Copper—

Ingot.

Lake.....11⅞¢ @ 12¼¢
Casting Brands.....11¢ @ 11¾¢

Sheet and Bolt.

List on following page. Discount to retailers, 25%.

Copper Bottoms.

List on following page. 25%.

Seamless Brass and Copper Tubes.

Base price, 17½¢, Chicago, with extras according to size.

Copper, Bronze and Gilding Tube, 3¢ ℔ additional.

Brazed Brass Tubing.

(To No. 20 inclusive.)

Add freight from New York to Chicago to these prices, or 50¢ ℔ 100 ℔.

Above 5-16 inch to 3 inch inclu...	35¢
Plain, above 3 inch	45¢
Plain, 5-16 inch	45¢
Plain, ¼ inch	60¢
Plain, 3-16 inch	$1.00
Plain, ⅛ inch	$1.50
Fancy Tubing, Brass, to No. 20 inc	43¢ ℔
Bronze Tubing, ℔ more than Brass	

35 @ 40%

Roll and Sheet Brass.

List on following pages. 35 @ 40%.

Slab Spelter—

Western Spelter.....5

Sheet Zinc—

600 ℔ casks.....6¼¢
Less than Casks, ℔.....6¾¢

Lead—

Soft Pig Lead.....4¼¢
Bar.....4.60¢@5¢
Pipe.....5½¢, dis. 10¢
Block Tin Pipe.....35¢
Sheet.....6¢, dis. 10%

Solder—

½&½.....13¼¢@13¾¢
Extra Wiping.....12¢

The prices of the many other qualities of Solder in the market indicated by private brands vary according to composition.

Antimony—

Cookson.....12½¢@13½¢
Hallett's.....11½¢@12¾¢

Wire—See *Hardware.*

Wrought-Iron Pipe—

List on following page.

1¼ and under, Plain	57½&10%
1¼ and under, Galv	52½&10%
1½ and over, Plain	67½&10%
1½ and over, Galv	60&10%
Boiler Tubes, list Oct. 24, 1892	65@67½%
Casing, list Nov. 16, 1892	52½%
Inserted Joints Casing, list Nov. 16, 1892	47½%
Steel Boiler Tubes	27½%
Cold Drawn Seamless Steel Tubing	50%

Cast-Iron Soil Pipe—

Cast-Iron Soil-Pipe, Tarred; sizes 2 to 6 inches, inclusive	dis 70&2½%
Other sizes	dis 60%

Leader Pipes—

Abendroth's Galv. Spiral Riveted	60%
Austin's Corrugated	60%
Gordon & Gilbert's Corrugated	60%
Ritchie's (Galv. Iron only) Cor'd	60%
Ritchie's Spiral Lock Seam, Galv'd	55%
Austin's Spiral Ribbed Pipe	60%
Plain Adjustable Elbows	60%
James A. Miller Bros. (Galv'd Iron only) Corrugated	60%

Furnace Fittings—

Discount from Excelsior Steel Furnace Co's list.....50%

Steel Roofing—

Perfection	$3.75 square
Climax	$3.50 square
The Lloyd Spanish Tiling	$4.50 square

Metallic Shingles—

Cushman's	$1.25 square
Merchant & Co.'s Spanish Tiles:	
Copper, 14 oz	$36.00 square
Steel, painted	$9.00 square

Drain Pipe—

Discount from list.....50%

Paints, Oils, &c.—

Deodorized Benzine	7½@8 ¢
Iron Paint, Bright Red	℔ ℔, 2 ¢
" " Brown	℔ ℔, 1½¢
" " Purple	℔ ℔, 2½¢
" Ground in oil, B. Red	℔ ℔, 6½¢
" Ground in oil, Red	℔ ℔, 6½¢
" Ground in oil, Brown	℔ ℔, 6½¢
" Ground in oil, Purple	℔ ℔, 6 ¢
Linseed Oil, Boiled, in bbls	53¢
Linseed Oil, Raw, in bbls	50¢
Mineral Paints	2@4¢
Orange Mineral	10¼¢
Pure White Lead in Oil	6¾@7¼¢
Dry White Lead in bbls	6½@6¾¢
Red Lead, American	7@7½¢
Red Venetian, English, dry	$1.65@$1.70
Red Venetian in oil; asst'd cans, 8½¢; kegs	7¼¢
Sipe's Japan Oil, in bbls, ℔ gal	34¢
Spirits Turpentine, in bbls., ℔ gal	34½¢
Asphaltum, Trinidad Refined, ℔ ton	$45
Tarred Felt, 1 Ply, ℔ 100 ℔	$1.65
Tarred Felt, 2 Ply, ℔ roll 108 sq. feet	$1.50
Tarred Felt, 3 Ply, ℔ roll of 108 sq. feet	$2.00
Roofing Pitch, ℔ bbl. of 300 ℔	$3.20

NEW YORK, JULY 28, 1893.

Aluminum—

No. 2 Grade Metal, in ton lots..℔ ℔, $0.75
No 1 (guaranteed to be 98 % pure and over), in ton lots .....℔ ℔ .90
Lots less than 1 ton, 10¢ ℔ ℔ additional.

Antimony—

Cookson.....℔ ℔, 11¢
Hallett's.....℔ ℔, 10½¢

Brass—

Planished.....net
Roll and Sheet.....35@40%

Brass and Copper Tubes

Brazed Brass Tubing—

List May 20, 1889.

	Per ℔.
Plain, to No. 20 inclusive, above 5-16 inch to 3 inch inclusive	$0.35
Plain, to No. 20, above 3 inch	45
Plain, 5-16 inch to No. 20	45
Plain, ¼ inch	60
Plain, 3-16 inch	1.00
Plain, ⅛ inch	1.50
Fancy Tubing to No. 20, inclu...	43

35@10%

Copper and Bronze Tubing—

3¢ ℔ ℔ more than brass.

Bronze, Tobin—

Drawn Rods for Bolts, Forgings, &c

Over ¼ to 3½ inches inclusive....17¢ ℔ ℔
Over 3½ to 5 inches inclusive.....18¢ ℔ ℔

Piston Rods, Finished True, Smooth and Straight.

Over ¼ to 3½ inches inclusive....18¢ ℔ ℔
Over 3½ to 5 inches inclusive.....19¢ ℔ ℔

Clips—

Buffalo Damper: Nos. 1, $1.25; 2, $2.50 per doz.....40&10%

Conductors—

Corrugated. *Round or Square—*

Galvanized.....60%
Galvanized, Locked Joints.....60%
Tin.....60%

Spiral Riveted—

Galvanized.....50%

See also *Elbows and Shoes; Eave-Trough Miters; Strainers, Conductor.*

Conductor Strainers—See *Strainers, Conductor.*

Copper—

Bottoms, Pits and Flats.....15@25%

Ingot.

Lake.....11½¢
Ansonia Grade Arizona.....11¢
Ansonia Grade Casting.....10½¢

Planished......net

Sheet and Bolt......25@30%

Tubes—See *Seamless Brass Tubes.*

Coppers, Soldering—

See *Irons, Soldering*, in Current Hardware Prices.

Damper Clips Buffalo—

See Clips, Buffalo Damper.

Eave Troughs—

Lap or Slip Joint, Galvanized.....60%
Lap or Slip Joint, Terne.....50%

Eave-Trough Mitres—

Lap or Slip Joint.....list, net

Elbows—

Plain Adjustable—

Tin.....70%
Galvanized.....70%

Crimped Tubing—

Re-Tinned or Galvanized.....35%

Stove-Pipe—

Buffalo Four-Piece.

4½	5	5½	6	7 inch,
$0.78	.87	.90	.99	1.20 per doz.

..20 %

Elbows and Shoes—

Flat Crimp.

Tin.....35%
Galvanized.....35%

Corrugated.

Flat Crimp.

Galvanized.....60%

Round or Square.

Tin.....60%
Galvanized.....60%

Iron, Sheet—

Black.

	Common American.	R. G. Cleaned American.
Nos. 10 to 16	℔ ℔, 2¾@....	3¼¢
Nos. 17 to 20	℔ ℔, 3 @...	3¼¢
Nos. 21 to 24	℔ ℔, 3¼@....	3½¢
Nos. 25 and 26	℔ ℔, 3¾@....	3¾¢
No. 27	℔ ℔, 3¾@....	3¾¢
No. 28	℔ ℔, 3⅞@....	3⅞¢
American B. B.	℔ ℔, 4¢@4¼¢	

Russia, Planished, &c.

Genuine Russia, according to assortment.....℔ ℔, 12@13¢
Patent Planished....℔ ℔, A, 10¢; B, 9¢, 5%
Craig Polished Sheet.....℔ ℔, 8½¢

Galvanized.

	B. B.
Nos. 10 to 16	℔ ℔, 4¢
Nos. 17 to 22	℔ ℔, 4¼¢
Nos. 23 to 24	℔ ℔, 4½¢
Nos. 25 to 26	℔ ℔, 4¾¢
No. 27	℔ ℔, 5¢
No. 28	℔ ℔, 5½¢
Nos. 29 and 30	℔ ℔, 6¼¢

Filter Joints—

Lee's.....33⅓ %

Lead—

American Pig.....4¢
Bar.....4½¢

New York Prices.

Pipe	6¼¢, 20%
Tin Lined Pipe	15¢, 20%
Block Tin Pipe	37½¢, 20%
Sheet	7¢, 20%

Old Lead in exchange, 3¼¢ ℔ ℔.

Pittsburgh Prices.

Lead Pipe in whole coils, ℔ ℔, .05¢, 10&5%
Sheet Lead in whole coils, ℔ ℔, .05½¢, 10&5%

Metal, Expanded—

Manufacturers' list No. 5.

Lathing	10%
Fencing, Painted Sheets	20%
Netting, Painted Sheets	20%
Door Mats, Galvanized	25%
Window Guards, Paneled	15%
Tree Guards, Paneled	15%

Mitres Eave-Trough—See *Eave-Trough Mitres.*

Paints Oils &c.—

Lead, Amn. White, Dry or in oil:	
Kegs, lots less than 500 ℔	7 @7¼
Kegs, lots 500 ℔ to 5 tons	6¾ @ 6¾
Kegs, lots 5 tons to 12 tons	6⅝ @ 6⅝
Kegs, lots 12 tons and over	6¾ @ 6½
Lead, White, in oil, 25 ℔ tin pails, add to keg price	@ ½

Lead, White, in oil, 12½ ℔ tin pails, add to keg price..... ...@ 1
Lead, Red, bbls. and ½ bbls... 6 @ 7
Lead, Red, kegs ... . 6¼ @ 7¼
Ocher, American ..... 1½ @ 1¾
Red, Venetian, American ..... ₱ 100 ℔..1.00@1.10

Linseed Oil:
City, raw, ₱ gal..... ..@ .50
City, boiled..... ..@ .53
Western, raw..... ..@ .50

Spirits Turpentine:
In regular bbls.....28½@ . 29
In machine bbls..... .. .... 29 @ .29½

Putty:
In barrels and ½ bbls..... .01⅜ @ .01⅝
In tubs ..... .01⅝ @ .01⅞
In tin cans ..... .01½ @ .02½
In bladders . ..... .01⅞ @ .02¼

Roofing Material, &c.:
Asphaltum, Trinidad Refined, ₱ ton. ....$30.00@35.00
Asphaltum, Rock, ₱ ton.....$14.00
Coal Tar Felt, 1 Ply, ₱ ℔.....2¢
Coal Tar Felt, 2 Ply, ₱ roll 108 sq. ft. $1.42½
Coal Tar Felt, 3 Ply, ₱ roll 108 sq. ft. $1.80
Roofing Pitch, ₱ bbl.....$2.24

Pipe, Drain 50%

Pipe and Fittings, Cast Iron Soil—

Cast-Iron Soil Pipe, Tarred, sizes 2 to 6 Inches, inclusive.....60@60&10%
Other sizes.....55@55&10%
Cast-Iron Fittings, Tarred, sizes 2 to 6 inches.... .....60@60&10%
Other sizes.....55@55&10%

Pipe, Spiral—

Galvanized.....60%
Tin.....60%

Pipe, Wrought Iron—

For discounts see Current Hardware Prices.

Polish, Stove—

See Current Hardware Prices.

Rivets and Burrs—

For discounts see Current Hardware Prices.

Rock and Slag Wool—

	₱ ℔	₱ cub. foot.
Slag Wool, ordinary	1¼	19¢
Slag Wool, extra.	1¾	38½¢
Rock Wool, ordinary	2¼	27¢
Rock Wool, extra	7¼	43½¢

Rosin—

Common and Good—Strained,
Rosin, C. & D.....₱ bbl. $1.05@$1.10
Rosin, E. & F.....₱ bbl. $1.15@$1.35
Rosin, G. & H.....₱ bbl. $1.40@$1.85
Rosin, I. & K.....₱ bbl. $2.00@$2.70
Rosin, M. & N.....₱ bbl. $3.25@$3.75

Seamless Brass Tubes..net

Shoes and Elbows—See *Elbows and Shoes.*

Slate Roofing—

According to size, f.o.b. cars, Quarry Station.

Pennsylvania:
Best Bangor, ₱ sqr.....$3.25@$4.50
Pen Argyle, ₱ sqr..... 3.50@ 4.25
Peach Bottom, ₱ sqr..... 5.00@ 6.25
No. 1 Chapman, ₱ sqr..... 4.00@ 4.65
Lehigh Slates, ₱ sqr..... 3.00@ 4.50
Vermont:
Sea Green, ₱ sqr..... 2.70@ 3.20
Purple, ₱ sqr..... 3.50@ 4.50
Unfading Green, ₱ sqr..... 3.50@ 4.00
Red, ₱ sqr..... 9.75@12.00

Solder and Soldering Fluids—

Solder—

½ & ½ (Guaranteed).....13½@15¢
No. 1..... 11¾@12½¢
Prices of Solder indicated by private brands vary according to composition.

Soldering Fluids—

Concentrated Soldering Flux.
f.o.b. New York.
In barrels, ₱ ℔.....4¢
Smaller quantities, ₱ ℔.....5¢

Gedney's Soldering Fluid.
In carboys or barrels, ₱ ℔.....2¢
$1.50 for carboy or barrel; money refunded when returned.

Perfection Soldering Flux.
No charge for package.
Bbls., about 500 ℔, ₱ ℔.....3½¢ (5 cts.)
½ bbls., about 300 ℔, ₱ ℔.....4¢
Kegs, about 110 ℔, ₱ ℔.....4¢
75¢ extra for keg.
Kegs, about 55 ℔, ₱ ℔.....4¢ (5 cts.)

Yager's Soldering Salts.
½ ℔ bottles, each.....30¢
Large quantities, per ℔.....40¢

Spelter—

Western Spelter..... .....5¢@5½¢
Bertha..... .....8¢

Spiral Pipe—See *Pipe, Spiral.*

Stove-Pipe Elbows—*See Elbows, Stove Pipe.*

Stove Polish—See *Polish, Stove.*

Stove Trucks—See *Trucks, Stove.*

Strainers Conductor—

Galvanized.....60%

Tin, Pigs and Bars—

Banca, pigs, ₱ ℔ ... .21½¢
Straits, pigs, ₱ ℔..... .....21¢
Straits in bars, ₱ ℔.....22¢

Tin Plates—

American Terne Plates—

Apollo Roofing.
IC, 14 x 20.....$6.25
IC, 20 x 28..... .....12.50
IX, 14 x 20..... ..... 7.25
IX, 20 x 28.....14.50

Buckeye.
IC, 14 x 20.....$7.00
IC, 20 x 28.....14.00
IX, 14 x 20..... ..... 8.25
IX, 20 x 28 ... .16.50
IXX, 14 x 20..... 9.50
IXX, 20 x 28.....19.00

Continental Tin Plate Works.

	14 x 20	20 x 28
IC Terne, Pennsyl Old Method, Treble Coated.	$8.50	$16.75
IC Terne, Leominster, Extra coated.....	7.75	15.00
IC Terne, Waldo, Redipped	7.25	14.00
IC Terne, Alderly, Extra quality.....	6.37½	12.50
IC Terne, Phoenix.....	5.80	11.50
IC " Climax.....	5.70	11.25
IC " Venux.....	5.60	11.00
IC " Flag.....	5.50	10.50

De Mill's.
First New York, IC, 14 x 20.....$5.75
" " " IC, 20 x 28.....11.50
First New Jersey, IC, 14 x 20..... 5.75
" " " IC, 20 x 28.....11.50
Manhattan, IC, 14 x 20 ..... 7.25
" IC, 20 x 28 ....14.50

Dunlap's.
Double Dipped, IC, 14 x 20.....$8.25
" " IC, 20 x 28 .....16.50
" " IX, 14 x 20..... 9.50
" " IX, 20 x 28.....19.00
Domestic, IC, 20 x 28..... .....12.00
" IX, 20 x 28.....15.00

Glendale Tin Plate Co.
Optimus, Best Redipped, IC, 14 x 20.$8.25
" " " IC, 20 x 28.16.50
" " " IX, 14 x 20. 9.75
" " " IX, 20 x 28.19.50
N. F., Old Style, IC, 14 x 20..... 7.50
" " " IC, 20 x 28 .....15.00
" " " IX, 14 x 20 ..... 9.00
" " " IX, 20 x 28.... 18.00
Bonus, Extra Coated, IC, 14 x 20... 6.75
" " " IX, 14 x 20... 8.25
" " " IC, 20 x 28...13.50
" " " IX, 20 x 28...16.50

Hamilton's.
Hamilton's Best Redip'd, IC, 14x20 $9.25
" " " IC, 20x28 18.50
" " " IX, 14x20 10.75
" " " IX. 20x28 21.50
Osceola Hand Coated, IC, 14x20 8.25
" " " IC, 20x28 16.50
" " " IX, 14x20 9.75
" " " IX, 20x28 19.50
Lula Best Charcoal, IC, 20x28 12.50
" " " IX, 20x28 16.00

Laufman's.
Apollo, IC (Resquared), 14 x 20.....$8.12
Apollo, IX (Resquared), 14 x 20..... 9.37
Apollo, IC (Resquared), 20 x 28.....16.00
Apollo, IX (Resquared), 20 x 28.....18.50
Apollo, IC (Resquared), 20 x 56.....16.00
Apollo, IX (Resquared), 20 x 56.....18.50
Tip Top, IC (Resquared), 14 x 20.... 6.62
Tip Top, IX (Resquared), 14 x 20.... 7.88
Tip Top, IC (Resquared), 20 x 28....13.00
Tip Top, IX (Resquared), 20 x 28....15.50
Allegheny, IC, 14 x 20..... 6.12
Allegheny, IX, 14 x 20..... 6.38
Allegheny, IC, 20 x 28.....12.00
Allegheny, IX, 20 x 28 .....12.50

McKinley Tin Plate Co.
McKinley:
IC, 20 x 28 .....$12.00
IX, 20 x 28 ... .15.00
Fort Pitt.
IC, 20 x 28 .....$11.00
Chicago:
I , 20 x 28 .....11.50
Wilkinsburg Redipped:
IC, 20 x 28 .....$16.00
IX, 20 x 28 .....19.00

Merchant's.—All Stamped.
Crescent, IC, 20 x 28.....$12.00
Crescent, IC, 14 x 20..... 6.00
Hickory, IC, 20 x 28 (Resquared).. 12.75
Hickory, IC, 14 x 20 (Resquared)...6.37½
Empire, IC, 20 x 28..... 12.25
Empire, IC, 14 x 20.....6.12½
Alaska, IC, 20 x 28 (Resquared).... 14.00
Alaska, IC, 14 x 20 (Resquared).... 7.00
Merchant's Roofing, IC, 20 x 28 (Resquared)..... 17.00
Merchant's Roofing, IC, 14 x 20 (Resquared)..... 8.50
Merchant's Old Method, IC, 20 x 28 Resquared)..... 19.00
Merchant's Old Method, IC, 14 x 20 (Resquared 9.50

Pittsburgh Tin-Plate Works.
Kensington:
IC, 14 x 20 ..... $6.75
IC, 20 x 28..... 13.50
IX, 14 x 20..... 8.00
IX, 20 x 28 ..... 16.00
Westmoreland:
IC, 14 x 20..... $6.25
IC, 20 x 28..... 12.50
Juno:
IC, 14 x 20..... $5.75
IC, 20 x 28 .... 11.50

Scott's.—All Stamped.
Scott's Extra Coated, IC, 14 x 20 (Resquared) $9.25
Scott's Extra Coated, IX, 14 x 20 (Resquared)..... .....10.75
Scott's Extra Coated, IC, 20 x 28 (Resquared)..... .....18.50
Scott's Extra Coated, IX, 20 x 28 (Resquared)..... .....21.50
Neville, IC, 14 x 20 .... 6.00
" IX, 14 x 20..... 7.25
" IC, 20 x 28..... ....12.00
" IX, 20 x 28 .....14.00

N. & G. Taylor Co.'s.
Taylor, Old Style, IC, 14 x 20 (Stamped and Resquared)..... $9.25
Taylor Old Style, IC, 20 x 28 (Stamped and Resquared)..... 18.50
Taylor Roofing, IC, 14 x 20 (Stamped and Resquared)..... 8.00
Taylor Roofing, IC, 20 x 28 (Stamped and Resquared)..... 16.00
Columbia, IC, 14 x 20 (Stamped)... 7.00
Columbia, IC, 20 x 28 (Stamped)... 14.00
Maple, IC, 14 x 20 (Stamped)..... 6.50
Maple, IC, 20 x 28 (Stamped)..... 13.00
Willow, IC, 14 x 20..... 6.25
Willow, IC, 20 x 28..... 12.50
Knoxall, IC, 14 x 20 ..... 6.00
" IC, 20 x 28..... ..... 12.00
Globe, IC, 14 x 20..... 5.75
Globe, IC, 20 x 28..... 11.50

A. A. Thompson & Co.'s,
Old Colony, IC, 14 x 20.....$8.00
" " IC, 20 x 28..... .....16.00
Thompson's Puritan, IC, 14 x 20.....5.75
" " IC, 20 x 28....11.50
Durham, IC, 14 x 20.....5.75
" IC, 20 x 28.....11.50
Central, IC, 14 x 20..... 5.45
" IC, 20 x 28.....10.75
" WC, 14 x 20..... 5.25
" WC, 20 x 28.....10.25
Tarn, IC, 20 x 28.....10.50

U. S. Brands.—All Stamped.
U. S. Monongahela, IC, 14 x 20.....$8.50
U. S. Redipped, IC, 14 x 20..... 9.25
20 x 28 double the price of 14 x 20

American Bright Plates—

Continental Tin Plate Works.

	"Phoenix" extra.	Climax
IC, 14 x 20, Bright	$6.50	$6.25
IX, " "	...8.00	7.75

All sizes and thicknesses, etc.

Merchant's.
Merchant's Dipped, IC, 14x20.....$11.00
Palma Xtra, IC, 14x20.....7.25
Florence, IC, 14x20.....6.75

N. & G. Taylor Co.'s.
Brilliant, Tissue Packed, IC, 14x20..$9.00
Royal, extra, IC, 14x20.....7.00
Merion, IC, 14x20.....6.75
Linden, IC, 14x20..... .....6.50
Almond, IC, 14x20.....6.25
Mint, IC, 14x20.....6.00

U. S.
IC, 14x20.....$7.25
IC, 20x28.....14.50

Imported Terne Plates—

Charcoal.
Dean Grade.—IC, 14 x 20.....@$5.65
20 x 28.....$11.00
IX, 14 x 20.....@ 6.40
20 x 28.....@12.80
Abercarne Grade.—IC, 14 x 20.....@ 5.55
20 x 28.....@10.80
IX, 14 x 20.....@ 6.40
20 x 28.....@12.80

Imported Bright Plates—

Charcoal.
Duty: 2.2¢ ₱ ℔.
Melyn and Calland Grade. IC, 10 x 14.....@$6.50
" " IC, 12 x 12.....@ 6.75
" " IC, 14 x 20.....@ 6.50
" " IC, 20 x 28.....@13.00
" " IX, 10 x 14.....@ 8.50
" " IX, 12 x 12.....@ 8.75
" " IX, 14 x 20.....@ 8.50
" " IX, 20 x 28.....@17.00
" " DC, 12½ x 17.....@ 6.00
" " DX, 12½ x 17.....@ 8.00
Allaway Grade. IC, 10 x 14.....@ 6.00
" " IC, 12 x 12.....@ 6.25
" " IC, 14 x 20.....@ 6.00
" " IC, 20 x 28.....@12.00
" " IX, 10 x 14.....@ 7.50
" " IX, 12 x 12.....@ 7.75
" " IX, 14 x 20.....@ 7.50
" IX, 20 x 28.....@15.00
" DC, 12½ x 17.....@ 5.50
" " DX, 12½ x 17.....@ 7.00

Coke.
Steel Coke.—IC, 10x14, 14x20.$5.40@$5.50
10x20.....@ 8.50
20x28.11.50@12.00
IX, 10x14, 14x20.....@ 7.00
B. V. Grade.—IC, 10x14, 14x20....@ 5.50

Imported Boiler Plates.—

IXX, 14x26..(112 sheets)..... ..@$13.35
IXX, 14x28..(112 sheets)..... ..@ 14.50
IXX, 14x31..(112 sheets)..... ..@ 16.00

Tinning—

Brass and Copper.....net

Tubing—

Tin.....55%
Galvanized.....55%

Troughs, Eave—See *Eave Troughs.*

Trucks Stove—

Improved Lock Frame, per doz....$15.00
Steel Lock Frame, per doz..... 18.00

Iron Wire—

See *Hardware Prices.*

Brass and Copper.—

Standard List.....30@35%

Zinc—

600 ℔ casks.....6¼¢
Per ℔.....7¢

It Is Reported—

That Vensel & English's Hardware store at Butler, Pa., was recently damaged by fire. Loss, $7000; insurance, $2500. A. W. Root's Hardware, store was also damaged, the loss being about $2000, with no insurance.

That Thomas Newall has disposed of his Hardware store at Carterville, Mo., to Eli Keller of Webb city.

That the Hardware store of Young, Tuttle & Company, North Berwick, N. H., was burglarized on the 12th inst.

That B. K. Northrup will soon open a new Hardware and Stove store at Westport, N. Y.

That burglars visited the Hardware store of Baldwin Bros., Lincoln, Neb., on the 4th inst. and got away with a quantity of Razors and Shears.

That Charles Cutler, a Hardware merchant of Baldwin, Kan., was seriously injured while returning home from Lawrence. A runaway team dashed into his light buggy from the rear and completely wrecked it. Mr. Cutler was thrown to the ground and trampled upon by the team. His head was crushed on one side, his body bruised and his back badly wrenched. His condition is serious.

That the Hardware store of Stronk & Le Page, Baldwin, Wis., was broken into by burglars on the 7th inst. and $200 worth of Cutlery stolen.

That in a fire at Des Moines, Iowa, on the 5th inst., the Hardware stock of J. A. Garver & Co. was damaged by water to the extent of $9000.

That burglars entered the Hardware store of J. W. Seaman, Washington, Pa., on the 6th inst. and got away with $75 worth of stock, including Revolvers, Razors, Guns, &c.

That John N. Maute will soon erect a large Hardware store on Central avenue, Lancaster, N. Y.

That William Chamberlain has opened a new Hardware store at Dorchester, Mass.

That the Hardware store of Jater & Dixon, Russiaville, Ind., was destroyed by fire on the 6th inst. Loss, $7000.

That L. E. & E. E. Guignon's Hardware store at Corry, Pa., was damaged by fire on the 7th inst.

That burglars broke into the Hardware store of T. O. De Jean, Plankington, S. D, on the 14th inst., and secured some valuable plunder.

That Robert Malstrom's Hardware store at Lake City, Minn., was burglarized on the 14th inst. and $150 worth of goods stolen.

That T. J. and S. Ulen, Hardware merchants, Dexter, Mo., have sold out, Miller, Riddle & Co. continuing.

That the Robert Donahue Iron and Hardware Company, Burlington, Iowa, have filed articles of incorporation. The capital stock of the company is $75,000, of which $65,000 is paid up. The officers are: Robert Donahue, president and treasurer; Geo. Donahue, vice-president and Albert Cobworth, secretary.

Current Hardware Prices.

JULY 28, 1893.

Note.—The quotations given below represent the Current Hardware Prices which prevail in the market at large. They are not given as manufacturers' prices, and manufacturers should not be held responsible for them. In cases where goods are quoted at lower figures than the manufacturers name, it is not stated that the manufacturers are selling at the prices quoted, but simply that the goods are being sold, perhaps by the manufacturers, perhaps by the jobbers at the figures named.

The character @ is used to indicate a range of price; thus discount 50&10@50&10&5 % signifies that the goods in question are sold at prices ranging from discount 50 and 10 % to discount 50 and 10 and 5 %.

Adjusters, Blind—

Domestic.....₩ doz $3.00, 33⅓%
Excelsior....₩ doz $10.00.....50&10&2%
North's.....list net @ 10%
Zimmerman's—See Fasteners Blind.

Ammunition—See *Caps, Cartridges, Shells, &c.*

Anvils—

Eagle Anvils, ₩ ℔ 9¢.....15@15&5%
Peter Wright's.....11@11½%
Armitage's Mouse Hole.....10½@11¢
Am. Wrought, Horse shoe brand.11@11½¢
Trenton.....10@10½¢
Wilkinson's.....10½@11¢
Moore & ...rnes Mfg. Co.....33⅓%

Anvil Vise and Drill—

Millers Falls Co., $18.00.....20%
Cheney Anvil and Vise.....25%
Allen Anvil and Vise $3.00.....40&10%
Star.....45&5%

Apple Parers—See *Parers, Apple, &c.*

Augers and Bits—

Common Augers and Bits.....70@70&10%
Boring Machine Augers.....70@70&10%
Car Bits, 12-in. twist.....50%
Russell Jennings' Augers and Bits.25&10%
Jennings' Pattern Car Bits.....40%
Jennings' Pattern Auger Bits.....60%
Snell's Bits.....60&5%
C. E. Jennings & Co., No. 10, extension lip.....40%
C. E. Jennings & Co., No. 30.....60%
C. E. Jennings & Co., Auger Bits, ₩ set, 32⅛ quarters, No. 5, $5; No. 30, $3.50.25%
Lewis' Patent Single twist.....45%
Pugh's Black.....20%
Pugh's Jennings Pattern.....30%
L'Hommedieu Car Bits.....15&10%
Forstner Pat. Auger Bits.....15%
Cincinnati Bell-Hangers' Bits.....30&10

Bit Stock Drills—

Morse Twist Drills.....50&10&5%
Standard.....50&10&5%
Cleveland.....50&10&5%
Syracuse, for metal.....50&10%
Syracuse, for wood (wood list).30@30&5%
Cincinnati, for wood.....30&10%
Cincinnati, for metal.....45&10%

Expansive Bits—

Clark's small, $18; large, $26..35@35&10%
Ives' No. 4, ₩ doz. $60.....40%
Swan's.....40%
Steer's, No. 1, $26; No. 2, $18.....35@40%
Stearns' No. 2, $48.....20%

Gimlet Bits—

Common.....₩ gross $2.75@$3.25
Diamond.....₩ doz $1.25....40&10%
Bee.....25@25&5%
Double Cut, Shepardson's....45@45&10%
Double Cut, Ct. Valley Mfg. Co....30&10%
Double Cut, Hartwell's.....
₩ gro.,$10.00..40&10%
Double Cut, Douglass'.....40&10%
Double Cut, Ives.....60@60&10%

Hollow Augers—

Ives', French, Swift & Co. (Beecher), Douglass'.....33⅓@33⅓ &10%
Bonney's Adjustable, ₩ doz $48.....50%
Stearns'.....20&10%
Ives' Expansive, each $4.50.....50&5%
Universal Expansive, each $4.50.....20%
Wood's.....25@25&10%
Cincinnati Adjustable.....25&10%
Cincinnati Standard.....25&10%

Ship Augers and Bits—

L'Hommedieu's.....15&10@15&10&5%
Watrous'.....25@25&10%
Snell's.....25@25&10%
Snell's Ship Auger Patt'n Car Bits, 15&10@15&10&5%

Awl Hafts—See *Hafts, Awl.*

Awls—

Awls, Sewing, Common....₩ gr. 85¢@90¢
Awls, Shouldered Peg.....₩ gr. $1.50@$1.55
Awls, Pat. Peg.....₩ gr. 35¢@38¢
Awls, Shouldered Brad..₩ gr. $1.30@ 1.40
Awls, Handled Brad....₩ gr. $2.60@$3.00
Awls, Handled Scratch..₩ gr. $4.00@4.50
Awls, Socket Scratch..₩ doz. $1.10@$1.20

Awl and Tool Sets—See *Sets, Awl and Tool.*

Axes—

	Plain.	Beveled.
First quality, best brands.	$7.00	$7.50
First qual., other brands	6.50 / 6.75	7.00
Second quality	5.50	6.00

Axle Grease—See *Grease, Axle.*

Axles—

No. 1....3¼¢@4¼¢, No. 2, 5¢@6¢
Nos. 7 to 14.....60&10%
Nos. 15 to 18.....47½% 7%
Nos. 19 to 22.....70%
Concord Axles, loose collar.....4½¢@6¢ 3% cash
Concord Axles, solid collar.....5½¢@7¢
Watrous Tubular Self Oiling.....
33⅓%@33⅓&5%

Bag Holders—See *Holders, Bag.*

Balances—

Spring Balances.....40%

	No. 2000	20	30
Chatillon, ₩ doz.	$0.80	0.95	1.75 net

Chatillon Straight Balances.....40%
Chatillon Circular Balances.....50&10%

Barb Wire.—See *Wire, Barb.*

Bars—

Crow—

Cast Steel.....₩ ℔ 3½¢
Iron, Steel Points.....₩ ℔ 3¢

Basins, Wash—

Standard Fiberware, No. 1, 10¼-in., $1.80; 12-inch, $2.00; 13¼-inch, $2.50; 15-inch, $3.00.

Beams, Scale—

Scale Beams, List Jan. 12, '82..50&10@50&10&5%
Chatillon's No. 1.....40%
Chatillon's No. 2.....50%
Custer's.....33⅓%

Beaters—

Egg—

Dover.....₩ doz $1.00@$1.20
Duplex (Standard Co.).....₩ doz $1.00
Dover (Standard Co.).....₩ doz $1.00
Duplex Extra Heavy (Standard Co.)...
₩ doz. $3.50
Bryant's.....₩ gross $14.00
Double (H. & R. Mfg. Co.), $12.00; No. 1, $15.00; No. 2.....$36.00
Easy (H. & R. Mfg. Co.).....₩ gro $12.00
Triple (H. & R. Mfg. Co.).....₩ gro $16.50
Spiral.....₩ gro $4.25 @ $4.50
Improved Acme (H. & R. Mfg. Co.)....
₩ gro. $9.00
Silver & Co.....₩ doz $5.50

Culinary—

Keystone, P. D. & Co., Each, No. 1, $1; No. 2, $2.....20%

Bells—

Cow—

Common Wrought.....60&10%
Western, Sargent's list.....70&10%
Kentucky, "Star".....20&10%
Kentucky, Sargent's list.....70&10%
Kentucky Durham.....70&10%
Dodge, Genuine Kentucky....70@70&10%
Texas Star.....50&10@50&10&5%

Door—

Gong, Abbe's.....33⅓&10%
Gong, Yankee.....45&10%
Gong, Barton's.....40&10@50%
Crank, Brooks'.....50&10&2%
Crank, Cone's.....10%
Crank, Connel's.....20&10%
Lever, Sargent's.....60&10%
Lever, Taylor's Bronzed or Plated....net
Lever, Taylor's Japanned.....25&10%
Lever, R. & E. Mfg. Co.'s.....50&10&2%
Pull, Brook's.....50&10&2%

Electric—

Wollensak's.....20%
Bigelow & Dowse.....20%

Hand—

Light Brass.....70&10@70&10&5%
Extra Heavy.....70%
White.....70%
Silver Chime.....33⅓&10%
Globe Cone's Patent).....25&10@35%

Miscellaneous—

Call.....45@50%
Farm Bells.....₩ ℔ 3¢@3½¢
Steel Alloy Church and School Bells..40%

Bellows—

Blacksmiths'.....60&10&5@60&10&10%
Molders'.....40&10@50%
Hand Bellows.....40&10@50%

Belting, Rubber—

Common Standard.....75@75&10%
Standard.....70&5@70&10%
Extra.....60&10@60&10&10%
N.Y.B.&P. Co., Carbon.....60@60&5%
N.Y.B.&P.Co., Diamond.....50@50&5%
N.Y.B.&P.Co., Para.....40@40&5%

Bench Stops—See *Stops, Bench*

Benders and Upsetters, Tire—

Stoddard's Lightning Tire Upsetters..15%
Detroit Perfected Tire Bender.....15%
Green River Tire Benders and Upsetters.....20%

Bits—

Auger, Gimlet, Bit Stock Drills, &c., see *Augers and Bits.*

Bit Holders—See *Holders.*

Blind Adjusters—See *Adjusters, Blind.*

Blind Fasteners—See *Fasteners, Blind.*

Blind Staples—See *Staples, Blind.*

Blocks—

Cleveland Block Co., Mal. Iron.6)@6)&10%
Moore's Novelty, Mal. Iron.....50%
Sure Grip Steel Tackle Blocks.....25%
See also *Machines, Hoisting.*

Bolts—

Carriage, Machine, &c.—

Com. list June 10, '84.....75&10&5@80%
Genuine Eagle, Norway, list Oct. '84....
80&5@80&10%
Eagle, Norway, list Oct. '8480&10@80&15
Phila. pattern, list Oct. 7, '84.....80%
R.B.&W., old list.....70%
Machine, list Jan. 1, 1890.....80&10%
Bolt Ends, list Jan. 1, 1890.....80&10%

Door and Shutter—

Cast Iron Barrel, Square, &c.....70&10%
Cast Iron Shutter Bolts.....70&10%
Cast Iron Chain (Sargent's list)....65&10%
Ives' Patent Door Bolts..60&10@60&10&5%
Wrought Barrel.....70&10@75%
Wrought Square.....70&10@75%
Wr't Shutter, all Iron, Stanley's....
60&10@60&10&10%
Wr't Shutter, Brass Knob.....60@50&5%
Wr't Shutter, Sargent's list.....60&10%
Wr't Sunk Flush, Sargent's list....60&10%
Wr't Sunk Flush, Stanley's list.50&10&5%
Wr't B. K. Flush, Common.....55&10%

Stove and Plow—

Stove.....60&10@60&10&5%
Plow.....60&10&50@60&10&10%
R. B. & W., Plow.....55%

Tire—

Common, list Feb. 28, '83.....65@65&5%
Port Chester Bolt and Nut Company:
Empire list Feb. 28, '83.....65%
Keystone, Philadel., list Oct. '84.....80%
Norway, Phila., list Oct. '84.....75%
American Screw Company:
Norway, Phila., list Oct. 16, '84.....75%
Eagle, Phila., list Oct. 16, '84.....80%
Philadel., list Oct. 16, '84.....80%
Bay State, list Feb. 28, '83.....65%
R. B. & W., Philadel., list Oct. 16, '84...80%

Borers, Tap—

Common and Ring.....20&10%
Ives' Tap Borers.....33⅓&5%
Enterprise Mfg. Co.....20%
Clark's.....33⅓@35%

Borax—

Per ℔.....9½@10½¢

Boring Machines—See *Machines, Boring.*

Bow Pins—See *Pins, Bow.*

Boxes, Wagon—

Per ℔.....2¾¢

Boxes, Miter.

Spiker's Excelsior, 3 in. $7.50, 4 in $8 50, 5 in. $13.00, 6 in. $15.00.....20%

Braces—

American Bit Brace and Tool Co..
Nos. 10, 12, 20.....60&10%
Nos. 11, 21, 24, 27.....70&10%
Nos. 22, 23, 25.....60&10&5%
Nos. 13, 26, 36, 37.....70&10&5
Amidon's,
Barker's Imp'd Plain.....75&10@80%
Barker's Imp. Nickeled.....65&10@70%
Ratchet.....75&10@80%
Eclipse Ratchet.....60%
Globe Jawed.....40@40&10%
Corner Brace.....40@40&10%
Universal, 8 in., $2.10; 10 in.....$2.25
Buffalo Ball.....$1.10@$1.15
Barber's.....50&10%
Saxton's,
Barker's Imp. Polished.....75&10@80%
Barker's Imp. Nickeled.....65&10@70%
Ratchet, Polished.....50&10@60%
Ratchet, Nickeled.....40&10@50%
Buffalo Ball.....net, $1.10@$1.15
Bartholomew's,
Nos. 25, 27 and 30.....50&10@60&5%
Nos. 117, 118, 119.....70@70&5%
Common Ball, American.....$1.00@$1.10
Fray's Genuine Spofford's...50&5@60&10%
Fray's Nos. 70 to 120, 81 to 123. 207 to 414 50&10%
Ives' New Haven Novelty.....70@70&5%
New Haven Ratchet.....60&5@60&10%
Barber Ratchet.....60&5@60&10%
Barber's.....60&5%
Spofford.....60&5@60&10%
P. S. & W. Co., Peck's Patent.....60%
Rose & Johnson.....50%
Davis Patent.....50&10%

Brackets—

Shelf, plain,
Regular, list.....65@70%
Sargent's list.....60&10@70&10%
Shelf, fancy,
Sargent's list.....70@70&10%
Other makes at a wide range of prices.
Bradley Shelf Brackets.....70&10%

Bright Wire Goods—See *Wire.*

Broilers—

Hents' Self-Basting.	Inch.....	9	10	9x11
	Per doz...	$4.50	5.50	6.50

New Haven.....50%
Wire Goods Co.....65&10%
Morgan Odorless.....₩ doz. $12, 50%
Queen City.....33⅓%

Buckets, Well—

Galvanized—

Hill's.....₩ doz. 12 qt. $4.25; 14 qt. $5.25
Iron Clad.....₩ doz. 14 qt. $4.25@4.50
Helwig's Flat Iron Band.....$3.75
Helwig's Wired Top.....₩ doz $4.00

Bull Rings—See *Rings, Bull.*

Butcher's Cleavers—See *Cleavers, Butchers.*

Brass—

Wrought Brass.....80@80&1
Cast Brass, Tiebout's.....6

Cast Brass, Fast.....33⅓&10%
Cast Brass, Loose Joint.....33⅓&10%

Cast Iron—

Fast Joint, Narrow.....50&10&5@60
Fast Joint, Broad.....50&10@60%
Loose Joint.....
Loose Joint, Japanned.....
Loose Joint, Jap. with Acorns..
Parliament Butts.....
Mayer's Hinges.....
Loose Pin, Acorns.....
Loose Pin, Acorns, Japanned...
Loose Pin, Acorns, Japanned, Plated Tips.....
} 75@7½ &10%

Wrought Steel—

Fast Joint, Narrow.....
Fast Joint, Broad.....
Loose Joint, Broad.....
Table Butts, Back Flaps, &c.....
Inside Blind, Regular.....
Indide Blind, Light.....
Loose Pin.....
Bronzed Wrought Butts.....50@50&10%
} List Jan. 2 1893. 40@40&10%

Calipers—See *Compasses.*

Calks, Toe—

Gautier, One Prong, Blunt.....5½@6¢
Burke's One Prong, Blunt.....5½@6¢
Burke's, Two Prong, Blunt.....7½@8¢
Burke's, One Prong, Sharp.....6½@7¢

Can Openers—See *Openers, Can.*

Cans, Milk—

S. S. & Co.: 5-gal., $3.00; 8-gal., $4.40; 10-gal., $4.75 each.....40&10%

Cans, Oil—

Galvanized Blue Band, 5 gal., Tip-Top, ₩ doz, $12 00
Galvanized Blue Band, 5 gal., Faucet, ₩ doz., $8.00
Galvanized Blue Band, 1 gal., ₩ doz. $2.25
Glass Oil, Friend.....₩ doz. $2.75

Caps—

Percussion—

Hicks & Goldmark's and Union Metallic Cartridge Co. ₩ 100
F. L. Waterproof, 1-10's.....35@37¢
E. B. Trimmed Edge, 1-10's.....47@50¢
E. B. Grnd. Edge, Cent. Fire, 1-10's.....
47@50¢
Musket. Waterproof, 1-10's.....50@53¢
G. D.....27@30¢
S. B. Genuine Imported.....45¢
Eley's E. B.....56@58¢
Eley's D Waterproof, Central Fire..$1.00

Primers—

Berdan Primers, $1.00.....2¢
B. L. Caps (Sturtevant Shells) $1.00....2¢
All other Primers, $1.20.....2¢

Cards—

Watson's Cotton, Wool, Horse and File, list January 28, 1891.....85%

Carpet Stretchers—See *Stretchers, Carpet.*

Cartridges—

Rim Fire Cartridges.....50&5&2%
Rim Fire Military.....15&5%
Cent. Fire, Pistol and Rifle.....25&5&2%
Cent. Fire, Military and Sporting 15&5&2%
Blank Cartridges, except 22 and 32 cal., additional 10% to above discounts.
Blank Cartridges, 22 cal., $1.75.....2%
Blank Cartridges, 32 cal., $3.50.....2%
Primed Shells and Bullets.....15&5&2%
B. B. Caps, Round Ball, $1.75.....2%
B. B. Caps, Con. Ball, Swgd., $2.00.....2%

Carpet Sweepers—See *Sweepers, Carpet.*

Casters—

Bed, Plate, Shallow Socket...	Brass	55@55&10%
	Others	60@60&10%
Deep Socket		40&10%
Martin's Patent (Phœnix)		45&10@50&10%
Tucker's Patent, low list		45%
Payson's Anti-friction		70@70&10%
Payson's Truck		60@60&10%
Yale Casters, low list		45%
Yale, Gem		70%
Giant Truck Casters		35%
Stationary Truck Casters		50&10%
Socket Truck Casters		50@50&10%
Gwinner's Common Sense		45%
Gwinner's Hercules		45%

Cattle Leaders—See *Leaders, Cattle.*

Cement—

Victor Elastic.....5 ℔ pails ₩ ℔ 5¢

Chain—

Trace, Wagon and Fancy Chains, List revised May, 1893.....60@60&10%
American Coil, in cask lots,

3-16	¼	5-16	⅜	7-16	½	⅝	¾
$7.60	5.30	4.45	3.80	3.65	3.50	3.40	3.30

Less than cask lots, add½¢@½¢ ₩ ℔
German Coil, list July 12, 1892.60@60&10%
German Halter Chain, list July 12, 1892. 60@60&10%
Covert Halter.....60&5%
Cover Traces.....35&5%
Cover Heel Chain.....50&5%
Galvanized Pump Chain.
5 ton lots.....₩ 100 ℔ $5 50
1-ton lots.....₩ 100 ℔ $5.75
500-℔ lots.....₩ 100 ℔ $6.75
Less than 500 ℔.....₩ 100 ℔ $7.00
Onelda Halter Chain.....60@60&5%
Jack Chain, Iron and Brass, list July 10, 1893.....50%
Barnes' Reinforced Sash.....60&10%
Barnes' Victor Sash.....50%

Chalk—

White, case lots. ₩ gr 50¢, small lots.65¢
Red, case lots....₩ gr 67¢ small lots.75¢
Blue, case lots....₩ gr 75¢; small lots 90¢
See also Crayons

Chalk Lines—See *Lines.*

Checks, Door—
Unity 50%

Chisels—

Socket Framing and Firmer
P. S. & W .....
New Haven .....
Witherby, ... 75&10@75&10&10%
Mix .....
Ohio Tool Co. .....
Douglass ..... 75@75&5%
Buck Bros. 30%
Merrill ..... 60&10@60&10&5%
L. & I. J. White ..... 30@30&5%

Tanged and Miscellaneous.
Tanged Firmers ..... 50@50&10%
Butchers' ..... $4.75@$5.00
Spear & Jackson s ..... $5 to £
Buck Bros 30%
Cold Chisels, ₱ ℔ ..... 15@16¢

Chucks—
Beach Pat ..... each, $8.00 ..... 20%
Morse's Adjustable, each, $7.00, 20@20&5%
Danbury ..... each, $6.00, 30@30&5%
Syracuse, Balz Pat 25%
Graham Patent ..... 33⅓&%
Skinner's Patent Chucks.
Combination Lathe Chucks ..... 33⅓&%
Universal Lathe Chucks 40%
Independent Lathe Chucks 40%
Drill Chucks 15%
Union Mfg. Co.
Victor $8.50, 25%
Combination 40%
Universal 40%
Independent 40%

Churns—
Tinn Union, each, 5 gal. $3.25; 7 gal., $3.75; 10 gal., $4.25.
McDermaid Star Barrel Churn, each 6 gal., $2.60; 10 gal., $2.75; 15 gal., $3.00; 20 gal., $3.25.

Clamps—
R. I. Tool Co.'s Wrought Iron 25%
Adjustable, Cincinnati ..... 15&10%
Adjustable, Hammers ..... 15@15&5%
Adjustable, Stearn's ..... 30@30&10%
Stearn's Adjustable Cabinet and Corner ..... 30@30&10%
Cabinet, Sargent's ..... 70&10%
Carriage Makers', Sargent's .. 75@75&5%
Carriage Makers', P., S. & W Co .. 40&10%
Eberhard Mfg. Co ..... 40&5@40&10%
Warner's ..... 40&10@40&10&5%
Saw Clamps, see Vises, Saw Filers'.
Carpenter's, Cincinnati ..... 25&10%
Barnes' Machinists' Clamps ..... 33⅓&%

Cleavers, Butchers'—
Bradley s ..... 25@30%
L. & I. J. White ..... 20&5%
Beatty's ..... 40@40&5%
New Haven Edge Tool Co.'s 40%
P., S. & W ..... 33⅓&5@33⅓&10%
Foster Bros 30%
Schulte, Lohoff & Co ..... 40@40&5%

Clips—
Norway, Axle, ¼ & 5-16 ..... 55&5&5%
2d grade Norway Axle, ¼ & 5-16 .... 65&5%
Superior Axle Clips ..... 66⅔&5@70%
Norway Spring Bar Clips, 5-16 .. 60&5&5%
Wrought Iron Felloe Clips ..... ₱ ℔, 5½¢
Steel Felloe Clips ..... ₱ ℔, 5¢
Baker Axle Clips 25%

Cloth and Netting, Wire
—See *Wire, &c.*

Cockeyes 50%

Cocks Brass—
Hardware list ..... 60&2%

Coffee Mills—See *Mills, Coffee.*

Collars, Dog—
Chapman Mfg. Company, new list 40%
Medford Fancy Goods Co ..... 40&10@50%
Embossed, Gilt, Pope & Steven's list, 30&10%
Leather, Pope & Steven's list, ... 40%
Brass, Pope & Steven's list 40%

Combs, Curry—
Fitch's ..... 50&10@50&10&10%
Rubber, per doz., $10.00 ..... 25%
American Curry Comb Co. ..... 33⅓&@40%
Kohler's Magic Oscillating. ₱ doz., $2.00
Kohler's Humane ..... ₱ doz., $1.75

Compasses, Dividers, &c.
Compasses, Calipers, Dividers. 70@70&10%
Bemis & Call Co.'s
Dividers 65%
Compasses ..... 50&5%
Calipers, Inside or Outside 60%
Calipers, Wing 60%
Calipers, Double 65%
Calipers, Call's Patent Inside 55%
Excelsior 50%
Stevens & Co.'s ..... 25&10%
Starrett's
Spring Calipers and Dividers .... 25&10%
Lock Calipers and Dividers 25%
Combination Dividers 25%

Coolers, Water—
S. S. & Co.: 2-gal., $2.00; 3-gal., $2.50; 4-gal., $2.75; 6-gal., $3.40 each .... 33⅓&%

Coopers' Tools—
See *Tools, Coopers'.*

Cord—

Sash—
Common ..... ₱ ℔, 8½@9¢
Patent, good quality ..... ₱ ℔, 10@11¢
White Cotton Braided, fair .. ₱ ℔, 23@24¢
Common Russia Sash ..... ₱ ℔, 12½@13¢
Patent Russia Sash ..... ₱ ℔, 13½@ 14¢
Cable Laid Italian Sash ..... ₱ ℔, 19@20¢
India Cable Laid Sash ..... ₱ ℔, 11½@12¢
Silver Lake—
A quality, White, 50¢ 25%
A quality, Drab, 55¢ 25%
B quality, White, 30¢ 10%
B quality, Drab, 35¢ 10%
Sylvan Spring, Extra Braided, White. 34¢
Sylvan Spring, Extra Braided, Drab. 39¢
Semper Idem, Braided, White .... 27@28¢
Egyptian, India Hemp, Braided ..... 26¢
Massachusetts, White ..... 29¢
Samson—
Braided, White Cotton ..... ₱ ℔, 37¢
Braided, Drab Cotton ..... ₱ ℔, 42¢
Braided, Italian Hemp ..... ₱ ℔, 40¢
Braided, Linen ..... ₱ ℔, 56¢
Cate's Solid Braided—
Hercules, White ..... ₱ ℔, 25¢
Hercules, Drab ..... ₱ ℔, 30¢
Economy ,Drab ..... ₱ ℔, 27¢
Economy White ..... ₱ ℔ 22¢
Ossawan Mills—
Braided ,Giant, Whit ₱ ℔, 30¢ 20%
Braided Giant, Drab and Fancy, ₱ ℔ 25¢ 10%
Braided, Crown White, ₱ ℔, 50¢ .. 50%
Braided, Crown Drab and Fancy, ₱ ℔ 5¢ 30%

Wire Picture—
Braided or Twisted ..... 80&5@80&15%

Corkscrews—See *Screws, Cork.*

Corn Knives and Cutters
—See *Knives, Corn.*

Crackers Nut—
Table (H. & B. Mfg. Co) 40%
Blake's Pattern, ₱ doz., $2.00 ..... 10%
Turner & Seymour Mfg. Co 50%
Acme.
Japanned, ₱ gro., $30 ..... 50%
Nickel Plated, ₱ gro. $30 ..... 10%

Cradles—
Grain ..... 50&2@50&5&2%

Crayons—
White Crayons, ₱ gross ..... 7@8¢
D. M. Stewart Mfg. Co.:
Metal Workers', ₱ gross, $1.75 ..... 25%
Rolling Mill, ₱ gross, 2.50 ..... 25%
Railroad, ₱ gross, 2.00 ..... 25%
Soapstone Pencils, ₱ gross, 1.00 ..... 25%
See also *Chalk.*

Creamery Pails—See *Pails, Creamery.*

Crow Bars—See *Bars, Crow.*

Curry Combs—
See *Combs, Curry.*

Curtain Pins—
See *Pins, Curtain.*

Cutters—

Meat—

	1	2	3	4
Dixon's, ₱ doz.				40@40&5%
Nos.		$14.00	$17.00	$19.00 $30.00
Woodruff's, ₱ doz				40@40&5%
Nos.			100	150
			$15.00	$18.00
Hale's, ₱ doz.				70%
Nos.	11	12	13	
	$27.00	$33.00	$45.00	

	1	2	3	4	B	5
American						30%
Nos.	1	2	3	4	B	5
Each	$5	$7	$10	$25	$50	$60
Enterprise						25%
Nos.	10	12	22	32	42	
Each	$3	$2.50	$4	$6	$15	
Little Giant, ₱ doz					40&10 @50%	
Nos.	305	310	312	320	322	
	$35.00	$48.00	$14.00	$72.00	$68.00	
Triumph No. 505, ₱ doz., $21.00 .. 25@30%						
Miles' Challenge, ₱ doz					45@45&10%	
Nos.			1	2	3	
			$22.00	$30.00	$40.00	
Home No. 1, ₱ doz., $26.00					55&10%	
Draw Cut, each:						
Nos.	5	2	6	8		
	$50	$75	$80	$225		
Beef Shavers (Enterprise)						20%
Chadborn's Smoked Beef Cutter, ₱ doz.,						$66.00

Slaw and Kraut—
Tucker & Dorsey Mfg. Co.:
Slaw Cutters, 1 Knife, ₱ gross ... $21.00
Slaw Cutters, 2 Knife, ₱ gross ... 30.00
Kraut Cutters 40%

Tobacco—
Champion ..... 20&10@30%
Ali Iron ..... ₱ doz., $4.25
Nashua Lock Co.'s .. ₱ doz., $18.00, 50@55%
Wilson's 55%
Sargent's ..... ₱ doz., $24.00, 55&10
Acme ..... ₱ doz., $20.00, 40%

Washer—
Smith's Pat .... ₱ doz., $12.00, 20&10&10%
Johnson's ..... ₱ doz., $11.00, 33⅓%
Penny's .. ₱ doz.,, Pol. $14 ; Jap'd, $16, 55%
Appleton's ..... ₱ doz., $16.00, 60&10%
Bonney's ..... 30&10%
Cincinnati ..... 25&10%

Diggers, Post Hole, &c.—
Samson, ₱ doz., $34.00 ..... 25@25&10%
Fletcher Post Hole Augers, ₱ doz., $36.00, 20@20&10%
Eureka Diggers ..... ₱ doz. $12.00@$13.00
Vaughan's Post Hole Auger, ₱ doz., $8.50@$9.50
Kohler's Little Giant ..... ₱ doz., $18.00
Kohler's Hercules ..... ₱ doz., $14.00
Kohler's Invincible ..... ₱ doz., $12.00
Kohler's New Champion .... ₱ doz., $8.00
Scheidler ..... ₱ doz., $18.00
Cronk's Post Bars, ₱ doz., $60.00, 50&5&50&10%
Gibb's Post Hole Digger ..... ₱ doz., $15.00
Gibbs' National ..... ₱ doz., $12.00
Gibbs' Columbia ..... ₱ doz., $13.00
Gibbs' Imperial ..... ₱ doz., $7.50
Shimer's Hollow Handle .. ₱ doz., $24.00, 50%
Gem, Improved ₱ doz.,, $9.00@$10.00 net

Dividers—See *Compasses.*

Dog Collars—See *Collars, Dog.*

Door Checks—
See *Checks, Door.*

Door Springs—
See *Springs, Door.*

Drawers.
Money, ₱ doz ..... $18@$20
Waddell's Improved, ₱ doz $15.00

Drawing Knives—
See *Knives, Drawing.*

Drills and Drill Stocks—
Blacksmiths' ..... each $1.75
Blacksmiths' Self-Feeding, each $7.50, 20%
Breast, P. S. & W ..... 40&10%
Breast, Wilson's ..... 30&5%
Breast, Millers Falls ..... each $3.00, 25%
Breast, Bartholomew's ..... each $2.50 25&10@40%
Ratchet, Merrill's ..... 20@20&5%
Ratchet, Ingersoll's 25%
Ratchet, Parker's ..... 20@20&5%
Ratchet, Whitney's ..... 20&10%
Ratchet, Weston's ..... 20@25%
Ratchet, Moore's Triple Action .... 25@30%
Ratchet, Curtis & Curtis 30%
Whitneys Hand Drill, Plain, $11.00; Adjustable, $12.00 ..... 20&10%
Automatic Boring Tools ..... $1.75@$1.85
Chicopee Automatic Drill ..... 20&10%
Goodell Automatic Drills ..... 40&5%

Twist Drills—
Cleveland ..... 50&10&10%
Diamond, W. & B ..... 50&10&10%
Graham's Pat. Groove Shank. 50&10&10%
Morse ..... 50&10&10%
New Process ..... 50&10&10%
Standard ..... 50&10&10%
Syracuse (Metal list) ..... 50&10%

Drill Bits or Bit Stock Drills—See *Augers and Bits.*

Drill Chucks—See *Chucks.*

Dripping Pans—
See *Pans, Dripping.*

Drivers, Screw—
Douglass Mfg. Co ..... 20@20&10%
Disston's 50%
Buck Bros 30%
Stanley R. & L. Co.'s
No. 64, Varnished Handles ..... 65&10%
No. 86 ..... 70&10%
Sargent & Co.'s
No. 1, Forged Blade ..... 60&10&10%
Nos. 20, 40 and 60 ..... 66⅔&10&10%
P. S. & W 70%
Knapp & Cowles
No. 1 ..... 60&20@70%
No. 2 ..... 60&10&10@70&5%
No. 3 ..... 60&5@60&10%
Nos. 4 and 00, Acme and Ideal ... 50&5@50&10&5%
Stearns' ..... 25&10&5%
Gay & Parsons 35%
Champion ..... 25&10%
Clark's Pat ..... 30@33⅓%
Ellrich's Socket and Ratchet .. 25@25&10%
Allard's Spiral, new list 25%
Kolb's Common Sense .. ₱ doz., $6.00, 25&10%
Syracuse Screw-Driver Bits ..... 30&30&5%
Screw Driver Bits ..... ₱ doz., 50@75¢
Screw Driver Bitts, Parr's .. ₱ gross, $6.25
Fray's Hol. H dle Sets ... No. 3, $12.00, 45%
Cincinnati ..... 25&10%
Brace Screw Drivers ..... 25&10%
Buck Bros.' Screw Driver Bits .... 27⅓&5%
Goodell's Automatic 50%
Mayhew's Black Handle 50%
Mayhew's Monarch ..... 45&10%
C. T. Williamson Wire Novelty Co 50%

Egg Beaters—See *Beaters, Egg*

Egg Poachers—
See *Poachers, Egg.*

Electric Bell Sets—
See *Bells, Electric.*

Emery—No. 4 to No. 54 to Flour, CF.

	46 gr.	150 gr.	F.FF.
Kegs, ₱ ℔	4½¢	5 ¢	2½¢
½ kegs, ₱ ℔ ...	4¾¢	5¼¢	2¾¢
¼ kegs, ₱ ℔ ...	5 ¢	5½¢	3 ¢
10-₱ cans, 10 in case	6 ¢	6½¢	5 ¢
10-℔ cans, less than 10	10 ¢	10 ¢	7½¢

Enameled and Tinned Ware—See *Ware, Hollow*

Escutcheon Pins—
See *Pins, Escutcheon.*

Escutcheons—
Door Lock ....Same dis. as Door Locks.
Brass Thread ..... 60@60&10%
Wood 25%

Expanded Metal—
List No. 5.
Lathing 10%
Fencing, Painted Sheets 20%
Netting, Painted Sheets 20%
Door Mats, Galvanized 25%
Window Guards, Paneled 15%
Tree Guards, Paneled 15%

Extractors, Lemon Juice
—See *Squeezers, Lemon.*

Fasteners, Blind—
Mackrell's, ₱ doz., $1.00 ..... 20@20&10%
Van Sand's Screw Pat, $15 ₱ gr.. 60&10%
Van Sand's Old Pat., $15 ₱ gr. ... 55&10%
Austin & Eddy No. 2008 ..... ₱ gr., $9.00
Security Gravity ..... ₱ gr., $9.00
Zimmerman's ..... 50&10%

Faucets—
Fenn's 40%
Fenn's Cork Stops ..... 33⅓&%
Star 60%
Frary's Pat. Petroleum 60%
B. & L. B. Co.
West's Lock, Open and Shut Key .. 50%
Star, Metal Plug, new list 40%
Lockport, Metal Plug, reduced list.. 60%
Metallic Key, Leather Lined .... 60&10@60&10%
Cork Lined ..... 70&5@70&10%
Burnside's Red Cedar 50%
Burnside's Red Cedar, bbl. lots .... 50&10%
John Sommers'
Peerless Best Block Tin Key 40%
IXL, 1st quality, Cork Lined 50%
Diamond Lock 40%
Perfection, Fla. Red Cedar (in boxes) 40%
Boss Metallic Key 50%
Reliable Cork Lined 60%
O. K. Western Pattern Cork Lined .. 50%
No Brand, Red Cedar (in bbls.) .. 50&10%
Western Pattern Metal Key 40%
No Brand Metal Key 60%
Self Measuring
Enterprise, ₱ doz., $36.00 ..... 20%
Lane's ₱ doz., $36.00 ..... 25&10%

Felloe Plates—
See *Plates, Felloe.*

Fibre Ware—See *Ware, Fibre.*

Fifth Wheels—
Derby and Cincinnati ..... 45&5%
Brewster ..... 50&5%

Files—

Domestic—
Nicholson Files, Rasps, &c. 60&10&5@60&10&10%
Nicholson (X.F.) Files 25%
Nicholson's Royal Files (Seconds) .... 75% (extra prices on certain sizes.)
American ..... 66⅔&10@66⅔&10&5%
G. & H. Barnett (Black Diamond) 60&10@60&10&5%
Arcade ..... 60&10&10@70%
Eagle ..... 60&10&10@70%
Other makers, best brands .. 60&10&5@70%
Fair brands ..... 70&10@70&10&10%
Second quality ..... 80@80&5%
Heller's Horse Rasps ..... 50&7½@50&10%
McCaffrey's Horse Rasps ..... 50&10%
Chelsea Horse Rasps, Hand Cut .. 50&10%
Arcade Horse Rasps .... 60&10@60&10&5%
Trojan Horse Rasps ..... 60&10&5%

Imported—
Butcher ..... Butcher's list 20%
Stubs ..... Stub's list 25@30%

Fixtures Grindstone—
Sargent's Patent ..... 70&10%
Reading Hardware Co ..... 30&10%
P., S. & W. Co ..... 50&10%
Moore's 55%

Fluting Machines—
See *Machines, Fluting.*

Fluting Scissors—
See *Scissors, Fluting.*

Fodder Squeezers—
See *Squeezers, Fodder.*

Forks—
Hay, Manure, &c. Asso. List, 70@70&5&2%
Hay, Manure, &c., Phila. List, 60@60&10&2%
Plated, see Spoons.

Frames—

Saw—
White Vermont ..... ₱ gro., $9.00@$10.00
Red, Polished and Varnished .... ₱ doz., $1.50, 25%

Screen, Window and Door—
Porter's Pat. Window and Door Frame, 33⅓&10%
Warner's Screen Corner Irons .... 33⅓&@ 33⅓&10%
Stearns' Frames and Corners. 25@25&10%
Cortland ..... 40@40&5
Phillips' Window Screen Frames ..... 50@50&5%
Bonanza Window Screens .. 50&5@50&10%
Empire Fancy Screen Doors, ₱ doz .. $12

Freezers Ice Cream—
White Mountain ..... 60@60&5%
Granite State ..... 65@65&5%
Arctic ..... 70@70&5%
American 80%
Buffalo Champion ..... 65@65&5%
Shepard's Lightning ..... 65@65&5%
Gem 65%
Blizzard 70%
Double Action Crown 60%
Crown 60%
Star 60%
Peerless ..... 60&10%
Giant 60%
Zero 70%
Boss and Pet ..... 60&10&10&10%
Keystone, P., D. & Co., each, $1.50 .... 20%
Standard ..... 60@60&5%
Standard Double Action ..... 60@60&5%
Good Luck ..... 65@65&5%
Model ..... 60@60&5%
Confectioners' Machine 50%

Fruit and Jelly Presses—
See *Presses, Fruit and Jelly.*

Fruit Pickers—
See *Pickers, Fruit.*

Fry Pans—See *Pans, Fry.*

Funnels—
Gersdorff's Perfection, Standard and Globe; *Tin*, 1 gro., 10¢; 2 to 5 gro., 20¢; 5 to 10 gro. 30%
Copper, 1 to 6 doz., 15¢; 6 to 12 doz., 20¢; over 12 doz. 25%

Furnaces, Soldering—
Burgess No. 3 Gem tin reservoir $7.00
Burgess No. 3 Gem, Copper reservoir. $8.50
Clayton & Lambert No. 1 Fire-Pot, complete $6.00

Fuse—Dis. 12½@15%. ₱ 1000 ft.
Common Hemp Fuse, for dry ground. $2.70
Common Cotton Fuse, for dry ground. 2.25
Single Taped Fuse, for wet ground.. 3.85
Double Taped Fuse, for very wet gr.. 4.80
Triple Taped Fuse, for very wet gr.. 5.60
Small Gutta Percha Fuse, for water. 7.50
Large Gutta Percha Fuse, for water. 12.00

Gates Molasses—
Stebbin's Pattern ..... 80@80&5%
Stebbin's Genuine ..... 60&10&10%
Stebbin's Tinned Ends ..... 40&10%
Lincoln's Pattern ..... 70@70&10%
Weed's ..... 20&10%
Boss, ₱ doz.:
No. 1, $7; No. 2, $8; No. 3, $9; No. 4, $10 ..... 60&10&10%

Gauges—
Marking, Mortise, &c ..... 60&10%
Starrett's Surface, Center and Scratch. 25&10%
Stanley R. & L. Co.'s Butt and Rabbet Gauge ..... 20&10%
Barrett's Comb. Roller Gauge ..... ₱ doz $8.00@$8.50
Hoague & Peck's Champion Gauge—
With Scale ..... ₱ doz., $5.00
Without Scale ..... ₱ doz., $4.00
Wire, Wheeler, Madden & Co 10%
Wire, Morse's 25%
Wire, Brown & Sharpe's ..... 10@20%
Wire, P., S. & W. Co ..... 10&10%

Gimlets—
Nail and Spike ..... 50&10&5%
Eureka Gimlets ..... 60&10%
Diamond Gimlets ..... ₱ gr $5.00
Double Cut, Shepardson's ..... 45@45&5%
Doub e Cut, Ives' ..... 60@60&5%
Double Cut, Douglass' ..... 40&10%

Glue—
Le Page's Liquid ..... 25@25&5%
Upton's Liquid 35%
Improved Process ..... 25@25&5%
Dodd's Liquid Glue ..... 25@25&5%

Glue Pots—See *Pots, Glue.*

Grease, Axle—
Fraser's ..... Keg ₱ ℔ 4¢, Pail ₱ ℔ 5¢
Fraser's, in boxes ..... ₱ gr $9.50
Dixon's Everlasting, in bxs. ₱ doz 1 ℔ $1.20 ; 2 ℔ $2.00
Dixon's Everlasting .... 10-℔ pails, ea. 35¢
Lower grades, special brands, ₱ gr $5.50@$7.00
Axleine, tin boxes ..... ₱ gross $12.00
English Coach, wooden boxes ..... ₱ gross $3.50
English Coach, 5-℔ tin pails. ₱ doz. $3.50
Tiger, wooden boxes ..... ₱ gross $7.00
Tiger, 5-℔ tin pails ..... ₱ doz $2.85

Grindstones—
Family, regular list 60%
Family, Cleveland Stone Co 30%

Grindstone Fixtures—
See *Fixtures, Grindstone.*

Gun Powder—See *Powder.*

Hack Saws—See *Saws.*

Hafts, Awl—
Sewing, Brass Fer. ₱ gr $1.75
Pat. Sewing, Short. ₱ doz ..... 45@50%
Pat. Sewing, Long ..... ₱ doz $1.90
Pat. Peg, Plain Top. ₱ doz ..... 40@45%
Pat Peg, Leather Top . . ₱ doz 60

Halters—

Covert's, Rope, Jute.....60&10&10&2%
Covert's Rope, 7-16-in., Jute.....70&2%
Covert's Rope, ⅛-in., Hemp.....50&2%
Covert's Adj. Rope Halters.....40&2%
Covert's Hemp Horse and Cattle Tie, 50&10&2%
Covert's Jute Horse Ties.....70&2%
Covert's Jute Cattle Ties.....70&10&2%
Covert's Adj. Web Halters.....35&5&2%
Covert's Saddlery Works Halters...33⅓&%
Covert's Saddlery Works Horse and Cattle Ties.....33⅓&%
Covert's Saddlery Works Handy Web Halters.....33⅓&%

Hammers—

Handled Hammers—

Maydole's, list Dec. 1, '85.....25&10@35%
Buffalo Hammer Co.....
Humason & Beckley.....
Atha Tool Co.....
Verree.....
....50&10%
C. Hammond & Son.....40&10@—%
Fayette R. Plumb.
Artisans' Choice, A. E. Nail.....40&10%
Regular Y. & P., A. E. Nail.....50%
Horseshoe Turning Hammers.....50%
Other Hammers.....50&10%
Cheney's Claw.....40&10%
Cheney's Machinist's & Riveting...50&5%
Magnetic Tack, Nos. 1, 2, 3, $1.25, 1.50 & 1.75.....30&10%
Nelson Tool Works.....40&10%
Warner & Nobles, new list.....25&10
Peck, Stow & Wilcox.....35@40%
Sargent's.....40@40&10%

Heavy Hammers and Sledges—

3 ℔ and under...₩ ℔ 40¢
3 to 5 ℔.....₩ ℔ 36¢
Over 5 ℔.....₩ ℔ 30¢
} 75&10@75&10 &5%
Wilkinson's Smiths.....10½¢@11¢₩ ℔

Handcuffs and Leg Irons

—See *Police Goods.*

Handles—

Cross-Cut Saw Handles—

Atkins', new list.....40%
Champion.....15%
Ely's Perfection.....₩ doz., $3.00
Sensible.....40%

Iron, Wrought or Cast—

Door or Thumb.

Nos.	0	1	2	3	4
Per doz.	$0.90	1.00	1.08	1.35	1.50

60&10&10%
Roggin's Latches.....₩ doz 30@35¢
Bronze Iron Drop Latches..₩ doz 70¢ net
Jap'd Store Door Handles—Nuts, $1.62; Plate, $1.10; no plate, $0.88.....net
Barn Door, ₩ doz $1.40.....10&10%
Chest and Lifting.....70@70&10%

Wood—

Saw and Plane.....40&10@50%
Hammer, Hatchet, Axe, &c.....40@40&5%
Brad Awl.....₩ gr $2.00
Hickory Firmer Chisel, ass'd.₩ gr 4.50
Hickory Firmer Chisel, large.₩ gr 5.00
Apple Firmer Chisel, ass'd...₩ gr 5.00
Apple Firmer Chisel, large...₩ gr 6.00
Socket Firmer Chisel, ass'd..₩ gr 3.00
Socket Framing Chisel, ass'd.₩ gr 5.00
} 40&10@50%
J. B. Smith & Co.'s Pat File.....50%
File, assorted.....₩ gr 2.75
Auger, assorted.....₩ gr 5.00
Auger, large.....₩ gr 7.00
} 50%
Pat. Auger, Ives'.....30&10%
Pat. Auger, Douglass.....₩ set $1.25
Pat. Auger, Swan's.....₩ set $1.00
Hoe, Rake, Shovel, &c.....60@60&5%

Hangers—

Barn Door, old patterns.....70@70&5%
Barn Door, New England.....70@70&5%
Samson Steel Anti-Friction.....55%
Orleans Steel.....55%
Hamilton Wrought Steel Track.....55%
Champion.....60&10%
Climax Anti-Friction.....55%
Zenith for Wood Track.....55%
Sterling.....50&10@60%
Victor, No. 1, $15.00; No. 2, $16.50; No. 3, $18.00.....50&2%
Kidder's.....50@50&10%
Boss.....60&10@60&10&5%
Best Anti-Friction.....60&10@60&10&5%
Duplex (Wood Track).....60&10&5%
Terry's Modern.....50&10@50&10&5%
Terry's Ideal.....50&10@50&10&5%
Terry's Solid.....50&10@60%
Terry's Shield.....50&10@60%
Terry's Wrought Single Strap.....50&10%
Cronk's Patent, Steel Covered.....50&10%
Carrier Steel Anti-Friction.....50&10%
Richards'.....30@30&10%
Lane's New Standard.....50@50&5%
Lane's Standard.....50&5@50&10%
Lane's Parlor.....40%
Warner's Pat.....20&10&10%
Stearns' Anti-Friction.....20&10&10%
Stearns' Challenge.....25&10&10%
Cincinnati Nos. 1, $2.25; 3, $2.50; 4, $2.50.
Paragon, Nos. 5, 5¼, 7 and 8.....20&10%
Crescent.....60@60&10%
Nickel, Steel, Nos. 0, $25; 1, $20; 2, $15. 40&10@50%
Chicago Anti-Friction.....30&10%
Star.....40&10@40&10&5%
Barry.....50%
Interstate.....50&10@60%
Pendulum, Payson's.....40@40&10%
Moody.....45%
Economy, $6.00.....50&10%
Perfection.....50&10@50&10&5%
Lundy, Steel Parlor.....40%
Matchless.....50&10%
Magic.....45&10%
Wild West.....45&10%
Moore's Elevator.....33⅓&%
Moore's Baggage Car Door.....33⅓&%
Moore's Railroad.....55%

Harness Snaps—See *Snaps.*

Hatchets—

American Axe and Tool Co.
Blood's.....
Hunt's.....
Hurd's.....
Mann's.....
Peck's.....
Underhill's.....
} 40 & 10 & 50&5%
Buffalo Hammer Co.....
Fayette R. Plumb.....
C. Hammond & Son.....
Kelly's.....
Sargent's & Co.....
P., S. & W. Co.....
Ten Eyck Edge Tool Co.....
Collins.....10%
Schulte, Lokoff & Co.....5@5&5%

Hay and Straw Knives—

See *Knives.*

Hinges—

Blind Hinges—

Parker.....75&2%
Huffer.....50%
Clark's, Nos. 1, 3, 5, 40 and 50..80@80&5%
Clark's Mortise Gravity.....50%
Sargent's, Nos. 1, 3, 5, 11, 12, 13..75@75&10%
Reading's Gravity.....75&10@75&10&5%
Shepard's.
Noiseless.....75&10%
Niagara.....80%
Buffalo.....80%
Clark's Genuine Pattern.....80%
O. S., Lull & Porter.....75&10%
Acme, Lull & Porter.....75%
Queen City Reversible....70&10&5@75%
Clark's, Lull & Porter, Nos. 0, 1, 1½, 2, 2½, 3.....75&10&2½%
North's Automatic Blind Fixtures, No. 2, for Wood, $9.00; No. 3, for Brick, $11.50.....10%

Gate Hinges—

Western.....₩ doz $4.20, 60@60&10%
N. E.....₩ doz $7.80, 60@60&10%
N. E. Reversible ₩ doz..$5.60, 6 @60&10%
Clark's, Nos. 1 2, 3.....60&10&5%
N. Y. State.....₩ doz $4.90,60@60&10%
Automatic.....₩ doz $12.50, 50%
Shepard's.....60&10&5%

Spring Hinges—

Geer's Spring and Blank Butts....40%
Union Spring Hinge Co.'s list, March, 1886.....20%
Barker's Double Acting.....25%
Union Mfg. Co.....25%
Bommer's.....30%
Buckman's.....15@20%
Chicago.....30%
Bardsley's Patent Checking.....15%
Acme.....30%
U. S.....25&10%
Empire and Crown.....20%
Hero and Monarch.....55%
American, Gem and Star.....20%
Oxford.....20%
Royal.....66⅔%
Reliable.....60%
Champion.....60%
No. 10 Matchless.....60%
No. 25 Unbreakable.....60%
J. G. C. Covered, ₩ gro., $30.....50&5%
Samson.....60@60&7½%
Wiles', No. 1, ₩ gro., $16; No. 2.....$13
Devore, No. 1.....₩ gro., $18.00
Rex.....₩ gro., $13.00
Freeport.....₩ gro., $12.00
New Idea Nos. 1 and 10....₩ gross $13.00
New Idea Dbl. Acting.....45%
Ideal No. 3.....₩ gross $10.00
Stearns' Noiseless Floor Hinge, ₩ set, $5.00.....20&10@30%

Extra 5@10% often given.

Wrought Iron Hinges—

List February 14, 1891.
Strap and T.....50&10@50&10&5%
Corrugated Strap and T.....50&10&5%
Screw Hook and Strap.....
6 to 12 in., ₩ ℔.. 4¢
14 to 20 in., ₩ ℔..3½¢
22 to 36 in., ₩ ℔.. 3¢
Screw Hook and Eye....
¾ in., ₩ ℔ 7½¢
⅝ in., ₩ ℔ 5¾¢
½ in., ₩ ℔ 4¾¢
Rolled Blind Hinges, Nos. 32 and 34 50&10%
Rolled Blind Hinges, Nos. 232 and 234 55&10%
Rolled Plate.....70&10%
Rolled Raised.....70&10¢
Plate Hinges "Providence".....8, 10 & 12 in., ₩ ℔.....5¢ over 12 in. ₩ ℔.....4¢

Hoes—

Eye—

D. & H. Scovil.....20%
Lane's Crescent, Planters' Pattern.45&5%
Lane's Razor Blade, Scovil Pattern...30%
Maynard, S. & O. Pat.....45&5%
Sandusky Tool Co., S. & O. Pat.....60&5
Am. Axe and Tool Co., S. & O. Pat.....@60&10%
Chattanooga Tool Co., S. & O. Pat..60& 5@60&10%
Grub.....60&10%

Handled—

Garden, Mortar, &c.....70@70&5&2%
Planter's, Cotton, &c.....70@70&5&2%
Warren Hoe.....60@60&5%
Magic.....₩ doz $4.00

Hog Rings and Ringers—

See *Rings and Ringers—*

Hoisting Apparatus—

See *Machines, Hoisting.*

Hollow-Ware—

See *Ware, Hollow.*

Holders—

Bag—

Sprengle's Pat.....₩ doz $18....60%

Bit—

Extension.
Barber's, ₩ doz $15.00.....40@40&10%
Ives, ₩ doz $20.00.....60&5@60&10%
Diagonal.....₩ doz $24.00, 40%
Angular.....₩ doz $24.00, 40&5%

File and Tool—

Bals Pat.....₩ doz $4.00, 25%
Nicholson File Holders.....20%

Sash—

Motley's Adj. Sash, Medium Size..... ₩ doz $1.20, 40%

Hooks—

Cast Iron—

Bird Cage, Sargent's List....
Bird Cage, Reading.....
Clothes Line, Sargent's list.
Clothes Line, Moore's.....
} 60&10&10%
Clothes Line, Reading list. 60&10@60&10&10%
Ceiling, Sargent's list.....55&10&10%
Harness, Reading list..55&10@55&10&10%
Coat and Hat, Sargent's list. 55&10@60&10%
Coat and Hat, Reading. 50&10@50&10&10%
Coat and Hat, Moore's.....70%

Wrought Iron—

Cotton.....₩ doz $1.25
Cotton Pat. (N. Y. Mallet and Handle W'ks.....30%
Tassel and Picture, T. & S. Mfg.Co....50%
Wrought Staples Hooks, &c. See Wrought Goods

Wire—

Wire Coat and Hat, Gem, list April, 1886.....60@60&10
Wire Coat and Hat, Miles, list April, 1886.....50@50&10%
Indestructible Coat and Hat...45@45&5%
Wire Coat and Hat, Standard.60@60&10%
Handy Hat and Coat.....50&10@60%
Steady Ceiling Hooks.....50&10@60%
Belt.....80&15@80&20%
Atlas, Coat and Hat.....65%
Williamson's Bird Cage Hooks, List April, 1892.....40%
Bright Wire Goods—See Wire.

Miscellaneous—

Grass, No. 2, $2.00; No. 3, $2.10; No. 4, $2.25
Nolin's Grass.....₩ doz $2.25
Bush.....55@60%
Whiffletree—Patent.....55%
Hooks and Eyes—Malleable Iron. 70@70&10%
Hooks and Eyes—Brass.....60&10&10%
Fish Hooks, American.....50%
Bench Hooks—See Bench Stops.

Horse Nails—See *Nails, Horse*

Horse Shoes—

See *Shoes, Horse.*

Hose, Rubber—

Competition, Fair quality.....75@75&10%
Competition, Low Grade.....80@80&10
Standard.....70&10&70@10&5%
Extra.....60&10@60&10&10%
N. Y. B. & P. Co., Para.....25&5%
N. Y. B. & P. Co., Extra.....40&5@50%
N. Y. B. & P. Co., Dundee.....60@60&5%
Cotton Garden, ¾ in., coupled:
Fair Quality, ₩ ℔.....7¢
Good Quality, ₩ ℔.....8½¢

Huskers—

Blair's Adjustable.....₩ gr $8.00
Blair's Adjustable Clipper.....₩ gr 7.00
Hubbard's Solid Steel.....₩ gr 4.50

Indurated Fiber Ware—

See *Ware, Indurated Fiber.*

Irons.

Sad—

From 4 to 10, at factory....₩ 100 ℔, $2.30@$2.40
Self-Heating.....₩ doz $8.00
Self-Heating Tailors'.....₩ doz $18.00
Mrs. Potts' Sad Irons, per set:

No.	50	55	60	65
Small lots.....	.90	.85	1.05	.95

Crown.....60&10@60&10&5%
Ideal Irons, new list...50&10@50&10&10%
Salamander Irons.....25%
B. B. Sad Irons, ₩ ℔.....3@3½¢
Chinese Laundry (N.E.Butt Co.).8½¢, 15%
New England.....5¢, 20@20&5%
Mahony's Troy Pol. Irons.....25%
Sensible, list Jan. 91.....50&10&5%
Sensible Tailor's Irons.....33⅓&%
National Self-Heating.....30%

Soldering—

Soldering Coppers.....₩ ℔ 19@21¢
Covert's Adjustable, list Jan. 1, 1886, 35&2%
Tinker's Dread. ₩ doz $1.75; ₩ gro. $18

Pinking—

Pinking Irons, ₩ doz., 55@60¢.

Jack Screws—See *Screws.*

Jacks, Wagon—

Daisy.....33⅓&%
Victor.....33⅓&%
Lockport.....40%

Kettles—

Brass, Spun, Plain, list Jan. 1, '91..25&5%
Brass, Spun, Pld.W.M.list Jan. 1, '91..20%
Stamped Brass Kettles.....₩ ℔ 21¢
Enameled and Tea—See *Ware, Hollow.*

Keys—

Lock, Ass'n list Dec. 30, 1886..65&10@70%
Eagle, Cabinet, &c.....33⅓&2%
Hotchkiss' Brass Blanks.....40%
Hotchkiss' Copper and Tinned.....40%
Hotchkiss' Pad. and Cab.....35%
Wollensak Tinned.....50&10%

Knife Sharpeners—

See *Sharpeners, Knife.*

Knives—

Butcher, Shoe, &c.

Wilson's Butcher Knives, List Dec 8, 1890.....25%
Ames' Butcher Knives.....25%
Foster Bros.' Butcher, &c.....40%
Jordan's Aa A1 Butchers', list.....net
Nichols' Butcher Knives.....40&10%
W. W. Wilson, Butcher, 6 in., $2.00; 7 in., $2.70; 8 in., $3.80, &c.
Ames' Shoe Knives.....20@25%
Ames' Bread Knives, ₩ doz $1.50, 15@20%
Moran's Shoe and Bread.....20@20&10%
Hay and Straw—See Hay Knives.
Table and Pocket—See Cutlery.

Corn—

Bradley's.....10%
Wadsworth's.....25@25&10%

Drawing—

Witherby.....
P., S. & W.....
Mix.....
New Haven.....
Merrill.....
Douglass.....
Watrous.....
...75@75&10&5%
.....60&10@60&10&5%
.....75&75@5%
.....10&10@25%

L. & I. J. White.....30&1%
Bradley's.....35%
Adjustable Handle.....25@33⅓&%
Wilkinson's Folding.....25@35&5%

Hay and Straw—

Lightning, from jobbers....$8.00@$9.00
Wadsworth's.....40&7½@40&10%
Carter's Needle...₩ doz. $11.00@$11.50
Heath's.....₩ doz. $13.00@$13.50
Nolin's Hay.....₩ doz. $7.00@$8.00

Mincing—

Am. (2d quality), ₩ gr., 1 blade, $7
2 blades, $12; 3 blades, $18.....net
Lothrop's.....20&10%
Smith's, ₩ doz., Single, $2; Double $3 45@50%
Knapp & Cowles.....50&10@60%
Buffalo Adjustable....₩ dos. $3.00, 33⅓&%

Knobs—

Door, Mineral.....60@65%
Door, Por. Jap'd.....70@75%
Door, Por. Nickel.....$2.00@$2.25
Door, Por. Plated Nickel..$2.00@$2.25
Drawer, Porcelain.....60&10@60&10%
Hemacite Door Knobs.....40&10@50%
Yale & Towne Wood, list Dec., 1885..40%
Base, Rubber Tip.....70&10&5%
Picture, Judd's.....60&10&10@70%
Picture, Sargent's.....70&10%
Picture, Hemacite.....35&5%
Shutter, Porcelain.....65&10%
Carriage, Jap.....₩ gro 80¢, 60&10%
Bardsley's Wood Door, Shutter, &c...15%

Ladders.

Davies Extension and Single.....20&5%

Ladies—

Melting, Sargents'.....60@60&5%
Melting, Reading.....35&10%
Melting, P., S. & W.....35&10@40%
Melting, Warner's.....30%

Lanterns—

Tubular—

Regular, with Guard.....₩ doz $3.50
O. K., with Guard.....₩ doz $3.75
Side Lift, with Guard.....₩ doz $4.00
Square Lift, with Guard.....₩ doz $4.25
Anti-Friction, with Guard....₩ doz $4.50
Brass Plated, Sq. Lift, Guard.₩ doz $5.50
Cop. Plated, Sq. Lift, Guard..₩ doz $5.50

Bull's Eye Police—

2¾-inch regular.....₩ doz $3.00
3-inch regular.....₩ doz $3.00
2¾-inch flash light.....₩ doz $4.00
3-inch flash light.....₩ doz $4.50

Lawn Mowers—

See *Mowers, Lawn.*

Leaders, Cattle—

Humason, Beckley & Co.'s.....70%
Sargent's.....70&10@70&10&10%
Hotchkiss.....50%
Peck, Stow & W. Co.....60&10%

Lemon Squeezers—

See *Squeezers, Lemon.*

Lifters, Transom—

Wollensak's:
Class 3 and 4, Bronzed Iron.....60%
Class 3 and 4, Bronze Metal.....50%
Class 3 and 4, Brass.....50%
Skylight Lifters.....35%
Reiher's, list Feb. 20, 1891
Bronzed Iron Rods.....60@60&10%
Brass, Real Bronze or Nickel Plate..50%
Excelsior.....50&10&5%
Shaw's.....50&10%
Payson's:
Universal.....60%
Solid Grip.....60&10@60&10&10%
Imperial.....50&10%

Lines—

Cotton and Linen Fish.....50%
Chalk.....60%
Masons' Linen, 84 ft., No. 1, $1.25; No. 2, $1.75; No. 3, $2.25; No. 4, $2.75; No. 5, $3.25.....25%
Cotton Chalk.....55%
Samson Cotton, No. 4, $2; No. 4½, $2.50; 10%
Silver Lake, Braided No. 0, $6.00; No. 1, $6.50; No. 2, $7.00; No. 3, $7.50 ₩ gro.....25%
Mason's Linen, No. 3½, $1.50; No. 4, $2.00; No 4½, $2.50.
Mason's Colored Cotton.....45%
Wire Clothes..Nos. 18 19 20
100 ft.....$3.50 $3.00 $2.50
Ventilator Cord, Samson Braided, White or Drab Cotton..₩ dos $7.50..20%
Ossawan Mills, Chalk, Twisted, 60%; Chalk, Soft Braided, 50% Chalk, Braided, 25%.

Links, Open—

Terry's—per gro.:

Nos.	1	2	3	4
	$6.00	8.00	12.00	16.00

Locks, &c.—

Cabinet—

Eagle, Gaylord Parker and Corbin...
List March, '84, rev. Jan. 1, '85.33⅓&2½%
Deitz, Nos. 36 to 39.....40%
Deitz, Nos. 51 to 63.....40&10%
Deitz, Nos. 87 to 96.....50%
Champion Night Latches.....40%
Barnes Mfg. Co.....40@40&10%
Eagle and Corbin Trunk.....25&10
Champion Cab. and Combin.....33⅓&%
Yale.....net prices
Romer's.....25

Door, Locks, Latches, &c.—

R. & E. Mfg. Co., list Mar. 20, 1889.....
Mallory, Wheeler & Co., list July, '88.....
Sargent & Co., List Aug. 1, '88.....
Branford Lock Works.....
65&10@70% Much lower net prices often made

Brittan, Graham & Mathes, list Jan. 1890.....60&10&10%
Plate.....33⅓&2%
Barnes Mfg. Co.....40@40&10%
Yale.....net prices
Delts Flat Key.....30%
Romer's Night Latches.....15%
Brooklyn Latches.....50&10%
Warner's Burglar Proof, ₩ dos. $8.00, 50%

Elevator—

Moore's.....33⅓%

Padlocks—

List June 10, 1891.....50&2%
Norwich Lock Mfg. Co., old list.....50&2%
Yale Lock Mfg. Co.'s.....net prices
Eagle.....40%
Eureka, Eagle Lock Co.....40&2%
Romer's Nos. 0 to 91.....30%
Romer's Scandinavian, &c., Nos. 100 to 505.....15%
A. E. Deltz.....40%
Champion Padlocks.....40%
Hotchkiss.....30%
Star.....60%
Horseshoe.....₩ dos $9, 50@50&10%
Barnes Mfg. Co.....40@40&10%
Nock's.....30%
Scandinavian.....90&40%
E. T. Fraim's Keystone Scandinavian, Nos. 119, 120, 130 and 140.....90&10%
Other Nos.....65%
Ames Sword Co. up to No. 150.....40%
Ames Sword Co. above No. 150.....50%
Slaymaker, Barry & Co.
No. 1010 line.....90&5%
No. 41 line.....50%
No. 61 line.....60%
No. 21 line.....80%

Sash, &c.—

Clark's No. 1, $10; No. 2, $8 ₩ gr.....33⅓%
Ferguson's.....33⅓%
Victor.....60&10&2%
Walker's.....10%
Attwell Mfg. Co.....25&33⅓%
Reading.....66⅔&10@66⅔&10&10%
Hammond's Window Springs.....40%
Common Sense, Jap'd, Cop'd and Br'zed.....₩ gr $4.00
Common Sense, Nickel Plated.....₩ gr $10.00
Universal.....30%
Kempshall's Gravity.....60%
Kempshall's Model.....60@60&10%
Corbin's Daisy, list Feb. 15, 1886.....70%
Payson's Perfect.....60&10&10%
Hugunin's Sash Balances.....25&5&2%
Hugunin's New Sash Locks.....25&5&2%
Ives Patent.....60&10&5@60&10&10%
Fish (Liesche's pat.), No. 100, ₩ gr., $8; No. 105, ₩ gr., $10.....50%
Davis, Bronze, Barnes Mfg. Co.....60%
Champion Safety list January, 1893.70&5%
Security.....70%
Giant, list Jan., 1892.....70&5%
Wolcott's.....60&10&5%
Monarch.....50%

Lumber Tools—

See *Tools, Lumber.*

Lustro—

Four-ounce bottles.....₩ dos, $1.75; ₩ gross.....$17.00

Machines.

Boring—

	Without Augers.	Upright.	Angular.
Douglas	$5.50	$6.75	50%
Snell's, Rice's Pat...	5.50	6.75	40&10&10%
Jennings'	5.50	6.75	45@45&10%
Other Machines	2.35	2.75	
Phillips' Patent with Augur	7.00	7.50	
Miller's Falls	7.50		25%

Boss, Carpenters' 3.60
Boss, Ship Bldrs'. 3.85

Fluting—

Knox, 4½-inch Rolls.....$3.25 each } 35%
Knox, 6-inch Rolls.....$3.60 each }
Eagle, 3½-inch Rolls, $2.15.....35%
Eagle, 5½-inch Rolls, $2.85.....35%
Crown, 4½ in., $3.50; 6 in., $4.00; 8 in., $6.50 each.....35%
Crown Jewel, 6 in.....$3.50 each, 35%
American, 5 in., $3.00; 6 in., $3.40; 7 in., $4.50 each.....35%
Domestic Fluter.....each, $1.50
Geneva Hand Fluter, White Metal, ₩ doz $12, 25%
Crown Hand Fluter, Nos. 1, $15.00; 2, $12.50; 3, $10.00; 4, $8.25.....30%
Shepard Hand Fluter, No. 85, per doz $15.50.....40%
Shepard Hand Fluter, No. 110, ₩ doz $11.00.....40%
Shepard Hand Fluter No. 95, ₩ doz $8.00.....40%
Combined Fluter and Sad Iron. ₩ doz $15.00.....30%

Hoisting—

Moore's Hand Hoist, with Lock Brake.20%
Moore's Anti-Friction Differential Pulley Block.....20%
Moore's Rope Differential Pulley Block.....60%
Energy Mfg. Co.'s.....25%
See also *Blocks.*

Washing—

Anthony Wayne, ₩ doz, No. 1, $42; No. 2, $36; No. 3, $42.
Wayne American.....₩ doz $36.00
Western Star ₩ doz, No. 2, $36; No. 3 $30.
Weiseli.....₩ doz $54.00
Fair and Square.....₩ doz $42.00

Mallets—

Hickory.....20&10@20&10&10%
Lignumvitæ.....20&10@20&10&10%
D. & L. Block Co., Hickory & L. V. 30@30&10

Mattocks—Regular list. 60&10@60&10&5%

Measures—

Standard Fiberware, No. 1, peck ₩ dozen, $3.50; ½ peck, $3.00

Meat Cutters—

See *Cutters, Meat.*

Menders, Harness—

Per doz.....$2.00

Milk Cans—See *Cans, Milk.*

Mills—

Coffee—

Box and Side, List, Jan. 1, 1888..60@60&5%
Net prices are often made which are lower than above discount.
American, Enterprise Mfg. Co., list Jan. 17, 1893.....20%
The Swift, Lane Bros.....30%
Waddel's New Box Mills, Ideal Brand, New List.....60%

Mincing Knives—

See *Knives, Mincing.*

Molasses Gates—

See *Gates, Molasses.*

Money Drawers—

See *Drawers, Money.*

Mowers, Lawn—

Best Machines: 10-in., $4; 12-in., $4.50; 14-in., $5; 16-in., $5.50; 18-in., $6
Low-Grade Machines: 10-in. $3; 12-in., $3.25 14-in., $3.50 each

Muzzles—

Safety.....₩ doz, $3.00, 25%

Nails.—

Cut and Wire. See Trade Report.
Wire Nails, Papered.
Association list, May 1, '92.80&10&10&5%
Tack Mfrs.' list.....70&5@70&10%
Hungarian, Finishing, Upholsterers', &c. See *Tacks.*

Horse—

Nos.	6	7	8	9	10	
American	9½	9½	9½	9½	9½	net
Ausable	28¢	26¢	25¢	24¢	23¢	40&5&2%
Clinton, Fin.	19¢	17¢	16¢	15¢	14¢	.30&5%
Essex	28¢	26¢	25¢	24¢	23¢	40&10@50%
Lyra	9½	9½	9½	9½	9½	net
Snowden	9½	9½	9½	9½	9½	net
Vulcan	23¢	21¢	20¢	19¢	18¢.	.25%
Northwest'n.	25¢	23¢	22¢	21¢	20¢	25@25&5%
A. C.	25¢	23¢	22¢	21¢	21¢	25&10@33⅓&5%
C. B. K.	25¢	23¢	22¢	21¢	21¢	33⅓@33⅓&10%
Maud S.	25¢	23¢	22¢	21¢	21¢	40&10&5%
Champlain	28¢	26¢	25¢	24¢	23¢	40&5&2%
Champion	25¢	23¢	22¢	21¢	20¢	10&10&10%
Capewell	19¢	18¢	17¢	16¢	16¢	10&5%
Anchor	23¢	21¢	20¢	19¢	18¢	35%
Western	23¢	21¢	20¢	19¢	18¢	50%
Empire Bronzed						13@14 ₩ ℔

Picture—

Brass Head, Sargent's list.....60@60&10%
Brass Head, Combination list.....50&10%
Porcelain Head, Sargent's list.50&10&10%
Porcelain Head, Combination list.40&10%
Niles' Patent.....40%

Nail Pullers—See *Pullers, Nail.*

Nail Sets—See *Sets, Nail.*

Nut Crackers—

See *Crackers, Nut.*

Nuts—List Dec. 18, 1889.

	Square.	Hex.
Hot Pressed	5.80¢	6.50¢ off list
Cold Punched	5.00¢	5.10¢ off list

In packages of 100 ℔, add 1-10¢ ₩ ℔, net; in packages less than 100 ℔, add ½¢ ₩ ℔, net.

Oakum—

Best or Government.....₩ ℔ 6¾@7¼¢
U. S. Navy.....₩ ℔ 5¾@6¢
Navy.....₩ ℔ 5¢@5¼¢

Oil Tanks—See *Tanks, Oil.*

Oilers—

Zinc and Tin.....65&10@70&5%
Brass and Copper.....50&10@50&10&5%
Malleable, Hammers' Improved, No. 1, $3.60; No. 2, $4.00; No. 3, $4.40 ₩ doz. 10@10&5%
Malleable, Hammers' Old Pattern, same list.....45%
Prior's Pat. or "Paragon" Zinc. 60&10&10%
Prior's Pat. or "Paragon" Brass.....50%
Olmstead's Tin and Zinc.....60%
Olmstead's Brass and Copper.....50%
Broughton's Zinc.....60%
Broughton's Brass.....50%
Steel, Draper & Williams.....50%

Openers, Can—

Messenger's Comet.....₩ doz $3.00, 25%
American.....₩ gross $2.75@$3.00
Duplex.....₩ doz 25¢, 15@20%
Lyman's.....₩ doz $3.75, 20%
No. 4, French.....₩ doz $2.25, 55@60%
No. 5, Iron Handle.....₩ gr $6.00, 45@50%
Eureka.....₩ doz $2.50, 10%
Sardine Scissors.....₩ doz $2.75@3.00
Star.....₩ doz $2.75
Sprague, No. 1, $2.00; 2, $2.25; 3, $2.50; 66⅔@70%
Excelsior, No. 1 $2.50; No. 2, $1.50.....40%
World's Best ₩ gross, No. 1, $12.00; No. 2, $24.00; No. 3, $36.00.....50&10%
Universal, ₩ doz $3.00.....55&5%
Domestic, ₩ doz $2.00.....45%
Champion, ₩ doz $2.00.....50%
Moore's.....70%

Packing, Steam—

Rubber—

Standard.....70@70&10%
Extra.....60@60&5%
N. Y. B. & P. Co., Standard.....50%
N. Y. B. & P. Co., Empire.....60%
N. Y. B. & P. Co., Salamander.....25%
Jenkins' Standard, ₩ ℔ 80¢.....25@25&5%

Miscellaneous—

American Packing.....10@11¢ ₩ ℔
Russia Packing.....14¢ ₩ ℔
Italian Packing.....13@14¢ ₩ ℔
Cotton Packing.....15@17¢ ₩ ℔
Jute.....7@8¢ ₩ ℔

Pails—Creamery—

S. S. & Co.: 18-qt., $7.00; 20-qt., $7.25 per doz.....5%

Galvanized—

Quarts	10	12	14
Hill's Light Weight, ₩ doz.	$2.75	3.00	3.25
Hill's Heavy Weight, ₩ dz.	3.00	3.25	3.75
Helwig's	2.50	2.75	3.00
Sidney Shepard & Co.	2.50	2.75	3.00
Iron Clad	2.50	2.75	3.00
Fire Buckets	2.75	3.25	3.50

Buckets—See Well Buckets.

Indurated Fiber Ware—25%

Star Pails, 12 qt.....₩ doz $4.20
Milk, 14 qt.....₩ doz $5.40
Stable, 14 qu.....₩ doz $6.00
Fire Pails, deep.....₩ doz $4.80
Fire Pails, round bottom.....₩ doz $5.40

Standard Fiber Ware—

	Plain.	Decr'd
Water Pails, 12 qt., ₩ doz.	$3.15	$3.75
Dairy Pails, 14 qt., ₩ doz.	3.75	4.25
Fire Pails, No. 1, 12 qt., ₩ doz	3.75	
Fire Pails, No. 2, 14 qt., ₩ doz	4.25	
Sugar Pails	5.50	6.00
Horse Pails	4.50	
Buggy Pails	3.50	
Slop Jars (bal. trap)	7.50	8.50
Chamber Pails, 14 qt.	6.00	7.00

Pans—

Dripping—

Small sizes.....₩ ℔ 5½¢
Large sizes.....₩ ℔ 5¢
Silver & Co. (Covered).....40%

Fry—

Standard List:

No.	0	1	2	3	4
₩ doz.	$3.00	$3.75	$4.25	4.75	$5.25
No.	5	6	7	8	
₩ doz.	$6.00	$7.00	$8.00	$9.00	

Polished, regular goods.....75@75&10%
Acme Fry Pans.....60%

Dust—

Steel Edge, No. 1.....₩ doz $1.75

Roasting and Baking—

Columbian, S. S. & Co.: Nos. 10, $2; 20, $2.25; 30, $2.50 each.....60&10%

Paper and Cloth—Sand and Emery—

List April 19, 1886.... 50&10@50&10&10%
Sibley's Emery and Crocus Cloth.....30%

Parers—

Apple—

Advance.....₩ doz $4.75
Baldwin.....₩ doz 5.25
Bonanza.....each 5.00
Daisy.....₩ doz 4.00
Dandy.....each 7.50
Eclipse.....₩ doz 4.25
Eureka, 1888.....each 16.00
Family Bay State.....₩ doz 12.00
Favorite.....₩ doz 5.00
Gold Medal.....₩ doz 4.00
Ideal.....₩ doz 4.00
Improved Bay State.....₩ doz 27.00@30.00
Little Star.....₩ doz 4.50
Monarch.....₩ doz 13.50
New Lightning.....₩ doz 5.50
Oriole.....₩ doz 4.00
Penn.....₩ doz 4.00
Perfection.....₩ doz 4.00
Pomona.....₩ doz 4.00
Rocking Table.....₩ doz 6.00
Turn Table.....₩ doz 4.50
Victor.....₩ doz 13.50
Waverly.....₩ doz 4.00
White Mountain.....₩ doz 4.00
72.....₩ doz 4.25
78.....₩ doz 7.00

Potato—

White Mountain.....₩ doz $4.50
Antrim Combination.....₩ doz $5.50
Hoosier.....₩ doz $13.50
Saratoga.....₩ doz $5.50

Pencils—

Faber's Carpenters'.....high list 50%
Faber's Round Gilt.....₩ gro $5.25
Dixon's Lead.....₩ gro $4.50
Dixon's Lumber.....₩ gro $6.75
Dixon's Carpenters'.....10%

Pencils, Soapstone—

See *Crayons.*

Pickers, Fruit—

Prize Fruit Pickers.....50%

Picks—

Railroad or Adze Eye, 5 to 6, $12.00; 6 to 7, $13.00.....60&10@60&10&10%

Picture Nails—

See *Nails, Picture.*

Pinking Irons—

See *Irons, Pinking.*

Pins—

Bow—

Humason, Beckley & Co.'s.....60&10%
Sargent & Co.'s, $17 and $18.....60&10%
Peck, Stow & W. Co....50&10@50&10&5%

Curtain—

Silvered Glass.....net
White Enamel.....net

Escutcheon—

Iron, list Nov. 11, 1885..50&10@50&10&5%
Brass.....60@60&5%

Pipe, Wrought Iron—

List April 13, 1893.

1¼ and under, Plain.....57½&10%
1¼ and under, Galv.....50&10%
1½ and over, Plain.....67½&10%
1½ and over, Galv.....67½&10%
Boiler Tubes, list Oct. 24, 1892.....65&10%
Casing, list Nov. 16, 1892.....52½&10%
Inserted Joints Casing, list Nov. 16, 1892.....47½&5%
Steel Boiler Tubes.....27½&5%
Cold Drawn Seamless Steel Tubing..50%

Planes and Plane Irons—

Wood Planes—

Molding.....40@40&10%
Bench, First quality.....45@45&10%
Bench, Second quality.....50@50&10%
Bailey's (Stanley R. & L. Co.) ..50&10%

Iron Planes—

Bailey's (Stanley R. & L. Co.).....50&10%
Miscellaneous Planes (Stanley R. & L. Co.).....25&10%
Steers' Iron Planes.....50@50&5%
Meriden Mal. Iron Co.'s.....50@50&5%
Davis' Iron Planes.....50@50&5%
Birmingham Plane Co.....60@60&5%
Gage Tool Co.'s Self-Setting...20&10&10%
Chaplin's Iron Planes.....50@50&5%
Sargent's.....60@60&10%
Standard Tool Co.....50@50&5%

Plane Irons—

Butcher's.....$5.00@$5.25 to
Buck Bros.....80,
Auburn Thistle.....
Ohio.....
Sandusky.....
} .30&10@30&10&10%
L. & I. J. White.....
Stanley R. & L. Co.....50&10%

Plates—

Felloe.....₩ ℔ 6¢@6½¢

Pliers and Nippers—

Button's Patent.....60%
Hall's No. 2, 5 in., $13.50; No. 4, 7 in., $21.00 ₩ doz.....40%
Humason & Beckley Mfg. Co..50@50&10%
Lindsay's Giant.....33⅓%
Gas Pliers.....60%
Gas Pliers, Custar's Nickel Plated..60&5%
Eureka Pliers and Nippers.....40%
Russell's Parallel.....25%
P., S. & W. Cast Steel.....50%
P., S. & W. Tinners' Cutting Nippers, add 6%.....10%
Carew's Pat. Wire Cutters.....30%
Morrill's Parallel, ₩ doz, $12.00....30&5%
Cronk's 8 in., $15.00; 10 in.....20%
Cronk's Button Pattern.....50&10@60%
Cronk's Carrier Pliers.....60@60&5%

Plumbs and Levels—

Regular List.....75&10@75&10&5%
Stanley's Duplex.....20&10%
Stanley's Handy.....20&10%
Disston's.....50%
Cook's.....40&10%
Pocket Levels.....70&10@70&10&10%
Davis Iron Levels.....30%
Davis Inclinometers.....10&10%

Poachers, Egg—

Buffalo Steam Egg Poachers, ₩ dos, No. 1, $6.00; No. 2, $9.00.....33⅓%
Silver & Co., 6-Ring, ₩ dos, $4.00; 8-Ring.....$2.00

Pokes, Animal—

Bishop s I. X. L.....₩ doz $6.00
Bishop's Monarch.....₩ doz $4.50
Bishop's Pioneer.....₩ doz $4.00
Bishop's American.....₩ doz $3.00
Eagle, Double Stale.....₩ doz $5.75
Eagle, Single Stale.....₩ doz $3.75
Buckeye, Single Stale.....₩ doz $2.75
Bolding.....₩ doz $6.00
Metallic Horse Poke.....₩ doz., $6.00

Police Goods—

R. I. Tool Co., Handcuffs, $15.00 ₩ dos 10%
R. I. Tool Co., Leg Irons, $25.00 ₩ dos 10%
Tower's.....25%
Daley's Improved Handcuffs; 2 Hands, Polished, ₩ doz, $48.00; Nickeled, $57.00; 3 hands, Polished, ₩ dos, $72.00; Nickeled, $84.00.....25%
J. P. Lovell's Police Goods.....25%

Polish—

Metal—

Prestoline.....30%
Prestoline Paste.....33⅓%
Gaston's Silver Compound.....33⅓%

Stove—

Joseph Dixon's.....₩ gro, $6.00, 10%
Gem.....₩ gro, $4.50, 10%
Gold Medal.....₩ gro, $6.00, 25%
Lustro.....₩ gro, $4.75
Ruby.....₩ gro, $3.75
Rising Sun, 5 gro lots.....₩ gro $5.50
Dixon's Plumbago.....₩ ℔ 8¢
Boynton's Noon Day.....₩ gro $18.00
Parlor Pride Stove Enamel, ₩ gro
Yates' Liquid, 2 3 5 10 gal
₩ gal...$0.80 .70 .60 .50
Yates Standard Paste Polish, 10 ℔ cans, ₩ ℔ 12½¢
Jet Black.....₩ gro $3.50
Japanese.....₩ gro $3.50
Fireside.....₩ gro $2.50
Diamond O. K. Enamel.....₩ gro $19.00
Bonnell's Liquid Stove Polish, ₩ gro $9.00
Bonnell's Paste Stove Polish, ₩ gro $6.00
Black Eagle Benzine Paste, 5 and 10 ℔ cans.....12½¢
Black Jack Water Paste, 5 and 10 ℔ cans.....12½¢
Nickel Plate Paste.....₩ gro $6.00
Crown Paste.....₩ gro $7.20
Crown Paste in 5 and 10 ℔ pails, ₩ ℔ 12¢
Black Flag.....₩ gro $7.20
Black Flag, 5 and 10 ℔ pails.....₩ ℔ 12¢
Black Flag, liquid, in bottles, ₩ gro $8.00
Diamond Rock Nickel Cleaner.....₩ gro $10.80
Raven Liquid, 6 oz. bottles.....₩ gro $5.00
Raven Liquid, 8 oz. bottles.....₩ gro $9.00
Raven Water Polish, large boxes.....₩ gro $7.20
Raven Paste in 5 lb. pails (cases of 6 pails), ₩ ℔ 10¢

Poppers, Corn—

Round or Square,
1 qt.....₩ doz $1.00; ₩ gr $8.00
1½ qt.....₩ doz $1.00; ₩ gr $9.00
2 qt.....₩ doz $1.50; ₩ gr $14.00

Post Hole and Tree Augers and Diggers—

See *Diggers, Post Hole, &c.*

Potato Parers—

See *Parers, Potato.*

Pots—

Glue—

Tinned.....40&10@40&10&5%
Enameled.....40&10@40&10&5%
Family, Howe's "Eureka".....40%
Family, L. F. C.'s "Handy".....50%

Powder—

In Canisters—

Fine Sporting, 1 ℔ each	0.90
Duck, 1 ℔ each	.60
Rifle, 1 ℔ each	.30
Rifle, ½ ℔ each	.18

In Kegs—

Rifle, 25-℔ kegs	$3.50
Rifle, 12½-℔ kegs	2.00
Rifle, 6¼-℔ kegs	1.15
Duck, 25-℔ kegs	11.00
Duck, 12½-℔ kegs	5.75
Duck 6¼ ℔ kegs	3.00

Presses—

Fruit and Jelly—

Enterprise Mfg. Co.....25%
Xenis.....₩ dos $3.50
Shepard's Queen City.....40%
Silver & Co.....₩ doz $2.75

Pruning Hooks and Shears—See *Shears.*

Pullers, Nail—

Scranton.. ..... ₩ doz., $18.00, 33⅓%
Giant, No. 1..... ₩ doz., $18.00, 10%
Giant, No. 2..... ₩ doz., $15.00, 10%
Pelican..... ₩ doz., $9.00, 25%
Eclipse..... Each, $2.00, net
Economy..... ₩ doz., $6.00

Pulleys—

Hot House, Awning, &c.....66⅔@70%
Japanned Screw.....60&10&10%
Brass Screw.....70%
Japanned Side.....60&10&10%
Moore's Side, Anti Friction.....50%
Moore's Ceiling or End, Anti-Friction 40%
Moore's Dumb Waiter, Anti-Friction 50%
Moore's Electric Light.....33⅓%
Japanned Clothes Line.....60&10%
Hay Fork, Solid Eye, $4.00; Swivel, $4.50.....50&10@50&10&5%
Hay Fork, "Anti-Friction," 5 in. solid, $5.70.....50%
Hay Fork, "F" Common and Patent Bushed.....20%
Hay Fork, Tarbox Pat. Iron.....20%
Hay Fork, Reed's Self-Lubricating....60%
Hay Fork, Moore's Anti-Friction 5 in. Wheel, ₩ doz., $12.00.....40%
Shade Rack.....45%
Tackle Blocks—See Blocks.
Shepard's Niagara, No. 25..₩ doz 23¢ net
Sash (Auger Mortise).
Common Sense.....60%
Empire.....60%
Ideal, Nos. 2, 4, 10 & 15 } 30% less 1¢ ₩
Acme. } doz net.
Star. }
On bbl. lots extra 5%.
Ideal, Nos. 25 and 55. ..₩ doz. 22¢ net.

Pumps—

Cistern, Best Makers.....60@60&10%
Pitcher Spout, Best Makers.....67½@70%
Pitcher Spout, Cheaper G'ds..75@75&10%

Punches—

Saddler's or Drive, good..₩ doz., 60@65%
Semis & Call Co.'s Cast Steel Drive.50&5%
Semis & Call Co.'s Springfield Socket..65%
Spring, good quality..₩ doz., $2.50@$2.60
Spring, Leach's Pat.....15%
Semis & Call Co.'s Spring.....50&5%
Semis & Call Co.'s Check.....55%
Solid Tinners', P., S. & W. Co., ₩ doz., $1.44.....55%
Tinners' Hollow Punches, P., S. & W. Co.....20&2%
Rice Hand Punches.....15%
Avery's Revolving.....40%
Avery's Sawset and Punch—See Sawsets
Niagara Hollow Punches.....20&2%
Niagara Solid Punches.....55%

Rail—

Sliding Door, Wr't Brass....₩ ℔, 35¢, 40%
Sliding Door, Bronzed Wr't Iron..₩ ft., 7¢
Sliding Door, Iron, Painted..₩ ft., 4¢, 40%
Barn Door, Light..In. ⅛ ⅜ ¾
Per 100 feet.....$2.00 2.50 3.10, 10%
S. D. for N. E. Hangers—
Small. Med. Large.
Per 100 feet.....$3.15 2.70 3.25 Net
Terry's Steel Rail.....₩ ft., 4½¢
Victor Track Rail, 7¢ ₩ foot.....50&2%
Carrier, double braced, Steel Rail, ₩ foot.....3½@4¢
Lundy Parlor Door, Planed Edge, ₩ ft.7¢
Moore's Steel Rail.....25&10%
Moody Steel Rail ₩ ft., 5¢.....45%

Rakes—

Cast Steel, Association g'ds..70@70&5&2%
Cast Steel, outside g'ds,.....70@70&5&2%
Malleable.....70@70&5%
Gibbs' Lawn Rake.....₩ doz., $4.90
Gibbs' Canton Lawn Rake...₩ doz., $3.75
Gibbs' Acme Lawn Rake....₩ doz., $4.75
Gibbs' Favorite Lawn Rake.₩ doz., $3.90
Gibbs' Crown Lawn Rake, No. 1.....
₩ doz., $4.90; No. 2, $5.40
Oneida Lawn Rake .....₩ doz., $6.00
Fort Madison Prize Bow Brace and Peerless.....65%
Fort Madison Steel Tooth Lawn Rake, $6.00.....25%

Razors—

J. R. Torrey Razor Co.....20%
Wostenholm and Butcher, $10 to $....10%
Jordan's AAA1, new list.....Net
Jordan's Old Faithful, new list.....Net
Galvanic.....₩ doz., $15.00
Electric Cutlery Co.....Net
Campbell Cutlery Co.....50%

Razor Strops—

See *Strops, Razor.*

Registers —

Moore's Japanned.....75%
Moore's Electroplated.....75%
Moore's Bronze Finishes.....70%
Moore's Solid Bronze.....65%
Moore's Stove Pipe.....33⅓%

Rings and Ringers—

Bull Rings—

Union Nut Co.....55%
Sargent's.....75&10%
Hotchkiss' low list.....30%
Humason, Beckley & Co.'s.....70&10%
Peck, Stow & W. Co.'s..50&10%50&10&10%
Ellrich Hdw. Co., White Metal, low list. 50&50&10%

Hog—

Top of the Hill Ringers.....₩ doz $2.00
Top of the Hill Rings.....₩ doz $1.25
Hill's Improved Ringers.....₩ doz $1.25
Hill's Old Style Ringers.....₩ doz $1.12½
Hill's Tongs.....₩ doz $3.00
Hill's Rings.....₩ doz bxs $1.00
Perfect Rings.....₩ doz bxs $1.50
Perfect Ringers.....₩ doz $2.15@$2.25
Blair's Hog Ringers.....₩ doz $2.00
Blair's Hog Rings.....₩ doz 90¢@$1.00
Champion Ringers.....₩ doz $2.00
Champion Rings, Double.....₩ doz $2.25
Brown's Ringers.....₩ doz $2.00
Brown's Rings.....₩ doz $1.15@$1.25
Electric Hog Rings.....₩ doz boxes $1.50
Electric Hog Ringers.....₩ doz $2.00
Major Rings.....₩ doz $1.25
Major Ringers.....₩ doz $2.00

Rivets and Burrs—

Norway Iron list Nov. 17, '87....60&10%
Second quality.....70%
Copper.....60@60&10%
Coppered Iron, Bettina Brand.....50&5%

Rivet Sets—See *Sets.*

Roasting and Baking Pans—See *Pans, Roasting and Baking.*

Rods—

Fair, Brass.....25@30%
Fair, Black Walnut.....₩ doz 40¢

Rollers—

Barn Door, Sargent's list. ....60&10&10%
Acme Moore's Anti-Friction.....55%
Union Barn Door Roller.....70%
Moore's Barn Door Stay 50%
Thompson Mfg. Co.'s Lawn Rollers ..30%

Rope—

The following prices are f.o.b., New York or factory, and are shaded ¼¢@½¢ on large lots; terms, 1½% for cash.

Manila, 7-16 in. diam. and larger ₩ ℔ 8¾¢
Manila.....⅜ in. ₩ ℔ 9¼¢
Manila.....¼ and 5-16 in. ₩ ℔ 9¾¢
Manila, Tarred Rope.....₩ ℔ 8½¢
Manila, Hay Rope.....₩ ℔ 8¼¢
Sisal.....7-16 inch and larger ₩ ℔ 7½¢
Sisal.....⅜ in. ₩ ℔ 8 ¢
Sisal.....¼ and 5-16 in. ₩ ℔ 8½¢
Sisal, Hay Rope.....₩ ℔ 7½¢
Sisal, Tarred Rope.....₩ ℔ 7 ¢
Sisal, Medium Lath Yarn.....₩ ℔ 7 ¢
New Zealand..7-16 in. & larger ₩ ℔ 7 ¢
New Zealand.....⅜ inch, ₩ ℔ 7¼¢
New Zealand..½ and 5-16 inch, ₩ ℔ 7¾¢
New Zealand, Hay Rope.....₩ ℔ 6¾¢
New Zealand, Tarred Rope....₩ ℔ 6¼¢
Cotton Rope.....₩ ℔ 13½@16¢
Jute Rope.....₩ ℔ 6½@7¢

Wire—

List February, 1892. All kinds.....45%

Rules—

Boxwood.....80&10&10@80&10&10&10%
Ivory.....50&10%
Starrett's Steel Rules and Straight Edges.....25&10%

Sad Irons—See *Irons, Sad.*

Sand and Emery Paper and Cloth—

See *Paper and Cloth.*

Sash Cord—See *Cord, Sash.*

Sash Locks—See *Locks, Sash.*

Sash Weights—

See *Weights, Sash.*

Sausage Stuffers or Fillers—See *Stuffers or Fillers, Sausage.*

Saws—

Disston's Circular.....45@45&5%
Disston's Cross Cut, list Jan. 1,'93.40&10%
Disston's Hand 25%
Woodrough & McParlin.
Hand, Panel and Rip.....25&10%
Cross Cuts, list Jan. 1, 1893.....45&10%
Wheeler, Madden & Clemson Mfg. Co.
Hand, Panel and Rip.....30&10%
Cross Cuts, list Jan. 1, 1893.....45&10%
Atkins' Circular..... .50&10%
Atkins' Cross Cuts, new list. 40%
Atkins' Mulay, Mill and Drag.....50&10%
Atkins' One-Man Saw.....40%
Atkins' Wood Saws.....40%
Peace Circular and Mill.....45@45&5%
Peace Hand Panel and Rip.....25@25&5%
Peace Cross Cuts, list Jan. 1,'93...45&10%
Richardson's Circular and Mill.45@45&5%
Richardson's X Cuts, list Jan. 1,'93.45&10%
Richardson's Hand, &c ..... .25@25&5%
C. E. Jennings & Co.'s 25%

Hack Saws—

Griffin's, complete.....40&10@50
Griffin's Hack Saw Blades.....40&10@50
Star Hack Saws and Blades.....25%
Eureka and Crescent.....25%

Scroll—

Lester, complete, $10.00..... .....25%
Rogers, complete, $4.00.....25%
Barnes' Builders' and Cab Makers'$15,25%
Barnes' Scroll Saw Blades.....35%

Saw Frames—

See *Frames, Saw.*

Saw Sets—See *Sets, Saw.*

Saw Tools—See *Tools, Saw.*

Scales—

Hatch, Counter, No. 171, good quality, ₩ doz $18.00@$19.00
Hatch, Tea, No. 161....₩ doz $6.50@$7.00
Union Platform, Plain.....$2.10@2.20
Union Platform, Striped.....$2.40@2.50
Chatillon's Grocers' Trip Scales.....50%
Chatillon's Eureka.....25%
Chatillon's Favorite.....40%
Family, Turnbulls.....30@30&10
Riehle Bros.' Platform.....40%

Scale Beams—

See *Beams, Scale.*

Scissors, Fluting.....45%

Scrapers—

Adjustable Box Scraper (S. R. & L. Co.) $6.00.....30&10%
Box, 1 Handle.....₩ doz $2.25@$2.50
Box, 2 Handle.....₩ doz $3.00@$3.25
Defiance Box and Ship.....20&10%
Foot.....50&10&60%
Ship, Common.....₩ doz $3.50 net
Ship, R. I. Tool Co.....10%

Screen Window and Door Frames—See *Frames*

Screw Drivers—

See *Drivers, Screw*

Screws—

Bench and Hand—

Bench, Iron.....55&10@55&10&10%
Bench, Wood, Beech.....₩ doz $2.25
Bench, Wood, Hickory.....20&10%
Hand, Wood.....25&10@25&10&5%
Hand, Grand Rapids, list.....35%

Coach, Lag and Hand-Rail—

Lag, Blunt Point, list Jan. 1, 1890..... 80@80&10%
Coach and Lag, Gimlet Point, list Jan. 1, 1890.....80@80&5%
Hand Rail, Sargent's..... 70&10%
Hand Rail, H. & B. Mfg. Co....70&10@75%
Hand Rail, Am. Screw Co..... .....75%

Jack Screws—

Jack Screws, Millers Falls list.50@50&10%
Jack Screws, P., S. & W.....35%
Jack Screws, Sargent.....70%
Jack Screws, Stearns'.....40@40&10%

Cork—

Humason & Beckley Mfg. Co..40&10@50%
Williamson's.....33⅓@33⅓&5%
Detroit Cork Screw Co.....33⅓%

Machine—

Flat Head Iron.....65%
Round Head Iron.....60%

Wood—

List January 1, 1891.
Flat Head Iron.....70%
Round Head Iron.....65%
Flat Head Brass.....70%
Round Head Brass.....65%
Flat Head Bronze.....70%
Round Head, Bronze: ...65%
Extra 10 or 10& 10% often given.
Rogers' Drive Screws.....82½%

Scroll Saws—See *Saws, Scroll.*

Scythes—

Grain.....40&5@40&10%
Grass.....40@10&50%

Scythe Snaths—

See *Snaths, Scythe.*

Sets—

Awl and Tool—

Aiken's Sets, Awls and Tools, No. 20, ₩ doz$10.00.....60@60&5%
Fray's Adj. Tool Hdls., Nos. 1, $12; 2, $18; 3, $12; 4, $9.....45%
Millers Falls Adj. Tool Hdls., Nos. 1, $12; 2, $18.....25%
Henry's Combination Haft...₩ doz $6.50
Stanley's Excelsior:
No. 1, $7.50; No. 2, $4.00; No. 3, $5.50.....30&10%
Common Brad Sets,
No. 42, $10.50; No. 43, $12.50...70&10&5%

Nail—

Square.....₩ gr. $4.00@$4.25
Round.....₩ gr. $3.25
Buck Bros.....27½%
Cannon's Diamond Point...₩ gr. $12, 20%

Rivet—

Regular list.....70%

Saw—

Stillman's Genuine....₩ doz $5.00@7.75, 40&5%
Stillman's Pattern, Hand, ₩ doz $3.25; Cross Cut, $6.50.....55@55&10%
Common Lever.....₩ doz $2.00, 40@50%
Morrill's No. 1, $15.00.....40&20%
No. 11, $16.60.....40&20%
Nos. 3 and 4, Cross Cut, $23.00..40&20%
No. 5, Mill, $31.00.....40&20%
No. 10, $15.50.....40&20%
Leach's..No. 0, $8.00; No. 1, $15...15@20%
Nash's.....20&10@20&10&10%
Hammer, Hotchkiss.....$5.50, 10%
Hammer, Bemis & Call Co.'s new Pat.45%
Bemis & Call Spring Hammer..... 30&5%
Bemis & Call Co.'s Plate.....20%
Bemis & Call Co.'s Cross Cut.....30&5%
Aiken's Genuine.....$13.00, 55@55&10%
Aiken's Imitation.....$9.00, 55@55&10%
Hart's Pat. Lever.....20%
Disston's Star..... .....25%
Leopold.....40&10@50%
Atkin's Lever.....₩ doz No. 1, $6.00
Atkin's Criterion.....₩ doz No. 1, $6.00
Croissant (Keller), No. 1, $15.00; No. 2, $24.00.....40&10@50%
Avery's Saw Set and Punch.....50%
Kohler's Royal.....₩ doz $7.00
Kohler's Giant Royal.....₩ doz $12.00
Crescent.....₩ doz $3.00
Lloyd's Acme.....₩ doz $15, 40&10%
Taintor Positive.....₩ doz $18, 50%

Sharpeners, Knife—

Larkins'.
Applewood Handles...₩ doz. $6.00, 40%
Rosewood or Cocobola. ₩ doz. $9.00 40%

Shaves, Spoke—

Iron.....45%
Wood.....30%
Bailey's (Stanley R. & L. Co.)....40&10%
Stearns'.....30&10%
Cincinnati.....25&10%
Goodell's ₩ doz. $9.00.....25%

Shears—

American (Cast) Iron..75&10@75&10&5%
Barnard's Lamp Trimmers..₩ doz. $3.75
Seymour's, List Dec. 1881. 60&10&10@60&10&10&5%
Heinisch's, List Dec. 1881. 60&10&10@60&10&10&5
Heinisch's Tailor's Shears.....33⅓%
Cast Steel Trimmers:
First quality ..... 80@80&10%
Second quality.....80&10@80&10&10%
Acme Cast Shears.....10&10%
Diamond Cast Shears.....10%
Clipper.....10&10%
Victor Cast Shears.....75&10@75&10&5%
Howe Bros. & Hulbert, Solid Forged Steel.....40%
Hatch Cutlery Co., Solid Steel Forged.60%
Davenport Cutlery Co..... .60@60&10%
Clauss brand, Japanned.....70%
Clauss brand, Nickeled, same list.....60%
Galvanic 3½ to 9 in., ₩ doz. $1.00 ₩ inch
Electric Cutlery Co ..... Net
Campbell Cutlery Co., Jap'd.....75%
Nickel Plated.....65%

Tinners' Snips—

Wrt. Handles, Steel Blades. ..20@20&10%
Niagara Snips and Shears. ...20&10%
Cast Handles, Laid with Steel 40%

Pruning Shears and Hooks

Disston's Combined Pruning Hook and Saw..... ...₩ doz. $18.00, 20&10%
Disston's Pruning Hook, ₩ doz. $12.00 20&10%
E. S. Lee & Co.'s Pruning Tools.50&10@70%
Pruning Shears, Henry's Pat., ₩ doz. $3.75@$4.00
Henry's Pruning Shears, ₩ doz. $4.25 @4.50
Wheeler, M. & C. Co., Combination, ₩ doz $12.00
Dunlap's Saw and Chisel, ₩ doz $3.50,30%
J. Mallinson & Co., No. 1, $5.25; No. 2, $7.50
P., S. & W. Co.....60%
Levin Pruner No. 1, $15.00 ₩ doz 40&3%
Levin Pruner No. 2, $21.00 ₩ doz...40&3%

Tinners', &c.—

Shears and Snips (P. S. & W.).....20@25%
Snips, J. Mallinson & Co.....33⅓%

Sheaves—

Sliding Door—

M. W. Co., list July, 1888....50&10@60&5%
R. & E., list Dec. 16, 1885.....55&10%
Corbin's list.....60@10&5%
Patent Roller.....60&10&5%
Patent Roller, Hatfield's.....75%
Russell's Anti-Friction, list Dec. 13, 1885.....60&5%
Moore's Anti-Friction.....50%

Sliding Shutter—

R. & E., list Dec. 18, 1885.....60&10&5%
Sargent's list.....70%
Reading list.....60&10&10%

Shells—

First quality 4, 8, 10 and 12 gauge 25&10&5%
First quality Rival, Club and Climax brands, 14, 16 and 20 gauge ($7.50 list).....20&10&5%
Prize.....40&5%
Star, Club, Rival and Climax Brands... 33⅓&10&5%
Smokeless brand, 12, 10, 16 gauge. 33⅓&10&5%
Trap brand, 12 and 10 gauge..33⅓&10&5%
Selbold's Comb. Shot Shells.....15&5%
Brass Shot Shells, 1st quality.....60&5%
Brass Shot Shells, Club, Rival, Climax. 65&5%

Shells, Loaded—

Standard List, July 19, 1890..... 40&10&10@40&10&10&5

Ship Tools—

L. & I. J. White.....80&5%

Shoes, Horse, Mule, &c.—

Horse—

Burden's, Perkins', Phœnix, Standard, Diamond State, Bryden's Boss and Crescent, at factory.....$4.00
Bryden's Frog Pressure, at factory..$5.00

Mule—

Add $1 ₩ keg to above prices.

Ox Wrought—

Ton lots.....₩ ℔ 9¢
1000 ℔ lots.....₩ ℔ 9½¢
500 ℔ lots.....₩ ℔ 10¢

Shot—

	Small lots.	
Drop, up to B, 25-℔ bag	$1.45	In ton lots a dis- count of 5 is made.
Drop, up to B, 5-℔ bag	.35	
Drop, B and larger, 25-℔ bag	1.70	
Drop, B and larger, 5-℔ bag	.40	
Buck and Chilled, 25-℔ bag	1.70	
Buck and Chilled, 5-℔ bag	.40	
Dust Shot, 25-℔ bag	2.00	
Dust Shot, 5-℔ bag	.45	

Shovels and Spades—

Ames' Shovels, Spades, &c., list Nov. 1, 1885.....30%
NOTE.—Jobbers frequently give 5@7½% extra on above.
Griffith's Black Iron.....50&10%
Griffith's C. S .....60@60&5%
Griffith's Solid C. S. R. R. Goods.....20%
St. Louis Shovel Co.....20@20&7½%
Hussey, Binns & Co.....15@25%
Hubbard & Co.... .....20@20&7½%
Lehigh Mfg. Co.....50&10%
H. M. Myers Co.....30%
Payne Pettebone & Son.....33⅓&5%
Remington's (Lowman's Pat.)40&10@50%
Rowland's Black Iron..50&10@50&10&5%
Rowland's Steel.....60&5@60&10%
Terra Haute Shovel & 25%

Shovels and Tongs—

Iron Head.....60&10@60&10&5%
Brass Head..... 60&10&10%

Sieves and Sifters—

Mann's Tin Rim ..... 50&25%
Buffalo Metallic, S. S. & Co... 50&25&20%
Shaker (Barler's Pat.) Flour Sifters ₩ gr $21.00
Electric Light..₩ doz $1.50; ₩ gro $15.00
A. & W. Sifters .....₩ gr $15.00
Hunter's Genuine. ₩ doz $1 75, ₩ gr $16.50
Hunter's Imitation..... ₩ doz $1.75; ₩ gr $15.00

Sieves, Wooden Rim

	Iron	Plated
Mesh 18, Nested, ₩ doz.	$0.80	$1.00
Mesh 20, Nested, ₩ doz.	.95	1.10
Mesh 24, Nested, ₩ doz.	1.15	1.35

Sinks, Wrought Steel—

Columbus, Painted or Unpainted..... 30@30&10 %
Columbus, Galvanized and Enameled. 50@50&10 %
New Era, Painted.....40&10@50&5 %
New Era, Galvanized and Enameled... 60&10&10@70&5 %

Skeins, Thimble—

Western list.....75&5@75&10%
Columbus Wrt. Steel, Special net prices
Coldbrookdale Iron Co.....50%
Seneca Falls Pattern.....30%
Utica P. S. T. Skeins.....30%
Utica Turned and Fitted.....35%

Slates—

School, by case..... .....40&10&50%
Large lots.....50&10&10%

Slaw Cutters—See *Cutters.*

Sleds Hand—

Tubular Steel ..... .₩ doz $24.00 40&50
Lots of 6 doz 50%

Snaps, Harness, &c.—

Anchor (T. & S. Mfg. Co.)....65½
Fitch's (Bristol)....50&10%
Hotchkiss....10%
Andrews....50%
Sargent's Patent Guarded....70&10&10%
German, new list....40&10%
Covert....50&10&5&2%
Covert, New Patent....50&10&5&2%
Covert, New R. E....60&10&5&2%
Covered Spring....60&10&10%
Covert's Saddlery Works' Triumph 33⅓&5
John Prott Snaps....75@75&5%
Kelley & Woolworth's Steel Harness....50&10@60%

Snaths—

Scythe....60&2@50&5&2%

Soldering Irons—

See *Irons, Soldering.*

Spittoons, Cuspidors, &c.

Standard Fiberware—

Cuspidors, 8¼-inch, ₱ doz., No. 5, $8; No. 5X, $9.
Spittoons, Daisy, 8-inch, No. 1, 4; 10 and 11 inch, $6.

Spoke Shaves—

See *Shaves, Spoke.*

Spoke Trimmers—

See *Trimmers, Spoke.*

Spoons and Forks—

Tinned Iron—

Basting, Cen. Stamp. Co.'s list....70&10%
Solid Table and Tea, Cen. Stamp. Co.'s list....70&10%
Buffalo, S. S. & Co....33⅓&2%

Silver Plated—

4 months or 5% cash 30 days:
Meriden Brit. Co., Rogers....40&15%
C. Rogers & Bros....40&15%
Rogers & Bros....40&15%
Reed & Barton....40@40&5%
Wm. Rogers Mfg. Co....40, 15&5%
Simpson, Hall, Miller & Co....40, 15&5%
Holmes & Edwards Silver Co....40, 15&5%
L. Boardman & Son....50&12½%

Miscellaneous—

Holmes & Edwards Silver Co.:
No. 67 Mexican Silver....50&10&5%
No. 30 Silver Metal....50&10&5%
No. 24 German Silver....50&10&5%
No. 50 Nickel Silver....50&5%
No. 49 Nickel Silver....50&10&5%
Wm. Rogers Mfg. Co.:
Rogers' Silver Metal....50&10&6%
18% Rogers' German Silver....60&6%
22% Rogers' Nickel Silver....50&6%
German Silver....50@50&5%
German Silver, Hall & Elton..50&5% cash
Nickel Silver....50&5@50&10&5% cash
Brittannia....60@60&5%
Boardman's Nickel Silver, list July 1, 1891....60&7½&5%
Boardman's Brittannia Spoons, case lots....60&5% cash

Springs—

Door—

Torrey's Rod, 39 in....₱ doz $1.20@1.2
Warner's No. 1, ₱ doz $1.50; No. 2, $3.40....55&55&10%
Gem (Coil), list April 19, 1886....20%
Star (Coil), list April 19, 1886....20&10%
Victor (Coil)....60&10@60&10&5%
Champion (Coil)....60&10@60&10&10%
Gowell's, No. 1, ₱ doz $18.00; No. 2, $15.00....50@50&10%
Rubber, complete, ₱ doz $4.50....55&10%
Hercules....50@50&10%
Phœnix....33⅓%

Carriage, Wagon, &c.—

Elliptic, Concord, Platform and Half Scroll....60&10@60&10&10&10 or net prices
Cliff's Bolster Springs....25%

Squares—

Steel and Iron, Nickel-Plated....80&10&10@80&25%
Try Square and T Bevels....60&10&10%
Disston's Try Square and T Bevels....50%
Winterbottom's Try and Miter....30&10%
Starrett's Micrometer Caliper Squares....25%
Avery's Flush Bevel Squares....40%
Avery's Bevel Protractor....50%

Squeezers—

Fodder—

Blair's....₱ doz $2.00
Blair's "Climax"....₱ doz $1.25

Lemon—

Porcelain Lined, No. 1....₱ doz $6.00
25&30%
Wood, No. 2....₱ doz $3.00, 35%
Wood, Common....₱ doz $1.70@1.75
Dunlap's Improved....₱ doz $3.75, 20%
Sammis....No. 1, $5.00; No. 2, $9; 12, $18 ₱ doz....25&10%
Jennings' Star....₱ doz $2.50
The Boss....₱ doz $2.50
Dean's..Nos. 1, ₱ doz $6.50; 2, $3.35; 3, $1.90; Queen, $2.50
Little Giant....50@50&5%
King....40&5%
Hotchkiss Straight Flash....₱ doz $12.00
Silver & Co., Glass....₱ gro. $9.00

Standard Fiber Ware—

See *Ware, Standard Fiber.*

Staples—

Barbed Blind, ½ in. and larger, ₱ ℔ 7@7½¢
Barbed Blind, ¾ in....₱ ℔ 8@8½¢
Fence Staples, Galvanized, Fence Staples Plain....Same price as B'rb Wire See Trd. Rep
Grand Crossing Tack Co.'s list....75&10%

Steelyards....40&10@50%

Stocks and Dies—

Blacksmith's:
Waterford Goods....35%
Butterfield's Goods....35%
Lightning Screw Plate....25@30%
Reece's New Screw Plates....25@30%
Reversible Ratchet....30%
Gardner....25%
Green River....35@30%

Stops, Bench—

Morrill's, ₱ doz. No. 1, $10.00; No. 2, $11.00....40&30%
Hotchkiss's....₱ doz $5, 10@10&10%
Weston's, No. 1 @ No. 2, $9, 25&10&5

McGill's, ₱ doz $3....10
Cincinnati....25&10
Terrell's Nos. 1 and 2, ₱ dos., $3; No. 3, $3.60....30%
Millers Falls....25%
Stearns'....20&10%

Stone—

Stones, Grind—See *Grindstones.*

Scythe Stones—

Pike Mfg. Co., list April, 1892....33⅓%
Cleveland Stone Co., list Nov. 1892..33⅓%

Oil Stones, &c.—

Pike Mfg. Co: 40 @ 40& 10%
Hindostan No. 1, ₱ ℔....8¢
Sand Stone....5¢
Turkey Oil Stone, 4 to 8 in....80¢
Turkey Slips....$2.00
33⅓@33⅓&10%
Lily White Washita....60¢
Rosy Red Washita....60¢
Washita Stone, Extra....50¢
Washita Stone, No. 1....40¢
Washita Stone, No. 2....30¢
Lily White Slips....90¢
Rosy Red Slips....90¢
Washita Slips, Extra....80¢
Washita Slips, No. 1....70¢
Arkansas Stone, No. 1, 3 to 5½ in., $2.80
Arkansas Stone, No. 1 5½ to 8 in., $3.50
Lake Superior....₱ ℔ 13¢
Lake Superior Slips....₱ ℔ 20¢

Stove Polish—

See *Polish, Stove.*

Stretchers Carpet—

Cast Steel, Polished....₱ doz $2.2
Cast Iron, Steel Points....₱ doz 75@80¢
Socket....₱ doz $1.75
Bullard's....25@25&10%

Strops, Razor—

Genuine Emerson....60@60&5%
Imitation " ..₱ doz $2.00, 20&10&5%
Torrey's....20%
Badger's Belt and Com....₱ doz $2.00
Lamont Combination....₱ doz $4.00
Jordan's Pat. Padded, list Nov. 1, '89, 50%
Electric Cutlery Co....Net
Campbell Cutlery Co....Net

Stuffer, Sausage—

Miles' Challenge, ₱ doz $20....50@50&5%
Perry....₱ doz, No. 1, $15.00; No. 0, $21.00....50&5@50&10%
Draw Cut No. 4, each $30.00....20%
Enterprise Mfg. Co., list Jan 17, '93..25&10%
Silver's....40&10%

Sweepers, Carpet and Lawn—

Carpet—

Bissell No. 5....₱ doz $17.00
Bissell No. 8....₱ doz $20.00
Bissell, Grand....₱ doz $36.00
Standard....₱ doz $24.00
Domestic....₱ doz $21.00
Domestic, No. 2....₱ doz $22.00
Grand Rapids....₱ doz $24.00
Crown Jewel, No. 1, $18.00; No. 2, $19.00; No. 3, $20.00
Magic....₱ doz $15.00
Improved Parlor Queen, Nickeled....₱ doz $27.00
Japanned....₱ doz $24.00
Excelsior....₱ doz $22.00
Garland....₱ doz $18.00
Parlor Queen....₱ doz $24.00
Housewife's Delight....₱ doz $15.00
Ladies' Friend....₱ doz $15.00
Ladies' Friend No. 2....₱ doz $16.00
Advance....₱ doz $18.00
Our Leader....₱ doz $19.00
Triumph....₱ doz $20.00
Goshen....₱ doz $21.00
Supreme....₱ doz $22.00
Easy....₱ doz $22.00
Gilt Edge....₱ doz $24.00
Acme....₱ doz $26.00
Imperial....₱ doz $26.00
Grand Republic....₱ doz $30.00
Banner....₱ doz $22.00
The Star....₱ doz $21.00
Reliable....₱ doz $22.00
The Rapid....₱ doz $22.00
Our Own....₱ doz $27.00
Model....₱ doz $27.00

Goshen Sweeper Company, Grand Rapids, Mich., make the following rebates:
5 dozen in 6 months....₱ doz $1.00
10 dozen in 6 months....₱ doz $2.00
25 dozen in 6 months....₱ doz $3.00
Except on L.F., when 10 dozen price is $13.50, and 25 dozen $13.00.

Lawn—

Thompson Mfg. Co....30%

Swings—

Davies Lawn....25%

Tacks, Brads &c.—

List October 19, 1889. Old established straight Weights. Short Weight goods are sold at lower prices.

Carpet Tacks—
American, Blued....66⅔%
American, Tin'd and Cop'd....70%
Steel, Bright and Blued....66⅔%
Steel, Tinned and Coppered....70%
Swedes Iron, Blued....72½%
Swedes Iron, Tinned....75%
American Iron Tacks, Domestic....66⅔%
Swedes Iron Tacks—
S. S., Blued....66⅔%
S. S., Tinned....70%
Lanc., Blued....55%
Lanc., Tinned....60%
Gimp and Lace Tacks—
S. S., Blued....62½%
S. S., Tinned....66⅔%
Lanc., Blued....55%
Lanc., Tinned....60%
Basket and Trimmers' Tacks—
Lanc....52½%
S. S....55%
Hungarian Nails....60%
Common and Patent Brads....55%
Leathered Tacks....10%
Brush Tacks, S. S....60%
Looking Glass Tacks, S. S....35%
Picture-Frame Points, S. S....35%
Finishing Nails....60%
Tinned and Clout Nails—
Black....65%
Tinned or Coppered....67½%
Basket Nails....60%
Chair Nails....52½%
Cigar Box Nails....45%
Tin Capped Nails....50%

Extra discount 25&2½%

Miscellaneous—

Double Point....90@90&10%
Wire Carpet Nails....50&10%
Claw Handle Carpet....₱ gross $4.00
Bonnie Blue....₱ box 1.50
Bill Nye Brad Box....4.00
Parisian Gilt Nails, cartoon....50
Home Tacks, No. 50 ₱ case (12 cartons), $36.00; No. 100, ₱ case (12 cartons), $72.00.
Home Nails, No. 200, ₱ case (12 cartons), $30.00; No. 400, ₱ case (12 cartons), $6 00.
50&2%
Upholsterers' Nails....50&10%

Wire Brads and Nails

Steel-Wire Brads, R. & E. Mfg. Co.'s list 50&10%

See also *Nails, Wire.*

Tanks, Oil—

Emerald, S. S. & Co.: 30-gal. $8.75; 60-gal., $11 each....50&10&5%

Tapes, Measuring—

American....40@40&5%
Spring....40%
Chesterman's, Regular list....25@30%

Thermometers—

Tin Case....80@80&10%

Thimble Skeins—See *Skeins.*

Ties, Bale—Steel.

Standard Wire, list....50&10&5%

Tinners' Shears, &c.—

See *Shears, Tinners' &c.*

Tinware—

Stamped, Japanned and Pieced, list Jan 20, 1887....70&10@70&25%

Tire Benders, Upsetters, &c.—See *Benders and Upsetters, Tire.*

Tobacco Cutters—

See *Cutters, Tobacco.*

Tools—

Coopers'—

Bradley's....20%
Barton's....20@20&5%
L. & I. J. White....20&5%
Albertson Mfg. Co....25%
Beatty's....30%
Sandusky Tool Co....30@30&5%
Shaves Cincinnati Tool Co....20%

Lumber—

Ring Peavies, "Blue Line"..₱ doz $20.00
Ring Peavies, Common....₱ doz $18.00
Steel Socket Peavies....₱ doz $21.00
Mall. Iron Socket Peavies...₱ doz $19.00
Cant Hooks, "blue Line"....₱ doz $16.00
Cant Hooks, Common Finish..₱ doz $14.00
Cant Hooks, Mall. Socket Clasp, "Blue Line" Finish....$16.00
Cant Hooks, Mall. Socket Clasp, Common Finish....₱ doz $14.50
Cant Hooks, Clip Clasp, "Blue Line" Finish....₱ doz $14.00
Cant Hooks, Clip Clasp, Common Finish....₱ doz $12.00
Hand Spikes....₱ doz 6 ft., $15.00; 8 ft., $20.00
Pike Poles, Pike & Hook, ₱ doz, 12 ft., $11.50; 14 ft., $12.50; 16 ft., $14.50; 18 ft., $17.50; 20 ft., $21.50.
Pike Poles, Pike only, ₱ doz, 12 ft., $10.00; 14 ft., $11.00; 16 ft., $13.00; 18 ft., $16.00; 20 ft., $20.00.
Pike Poles, not ironed, ₱ doz, 12 ft., $6.00; 14 ft., $7.00; 16 ft., $9.00; 18 ft., $12.00; 20 ft., $16.00.
Setting Poles, ₱ doz, 12 ft., $14.00; 14 ft., $15.00; 16 ft., $17.00.
Swamp Hooks....₱ doz $18.00

Saw—

Atkins', new list....40%

Transom Lifters—

See *Lifters, Transom.*

Traps—

Game—

Newhouse....40@40&5%
Oneida Pattern....70&10%
Game, Blake's Patent....40&10&5%

Mouse and Rat—

Mouse Wood, Choker, ₱ doz holes, 9@10¢
Mouse, Round Wire....₱ doz $1.50 10%
Mouse, Cage, Wire....₱ doz $2.50 10%
Mouse, Catch-'em-alive..₱ doz $2.50 15%
Mouse, Bonanza....₱ doz 0.90@$1.00
Rat, Decoy....₱ gr $10.00, 10%
Ideal....₱ gr $10.00
Cyclone....₱ gr $5.25
Hotchkiss Metallic Mouse, 5-hole traps, ₱ doz., 75¢; in full cases, ₱ doz. 60@65¢
Hotchkiss Imp. Rat Killer...₱ gro $18.50
Hotchkiss New Rat Killer...₱ gro $16.50
Schuyler's Rat Killer....₱ gro $15.00
Dandy....₱ doz., $1.75
Waddel's Go Bang, ₱ gro....$12.50

Fly—

Harper, Champion or Paragon....₱ doz. $1.75, ₱ gro. $16.50
Balloon, Globe or Acme....₱ doz. $1.50, ₱ gro. $13.50

Triers—

Butter and Cheese....25%

Trimmers, Spoke—

Bonney's....₱ doz $10.00, 50%
Stearns'....20&10%
Ives', No. 1, $15.00; No. 2, $12.00 ₱ doz. 55&10%
Douglas'....₱ doz $9.00, 20%
Cincinnati....25%

Trowels—

Lothrop's Brick and Plastering, 20&10&5@35%
Reed's Brick and Plastering....15%
Disston's Br'k and Plastering..25@25&10%
Peace's Plastering....25@25&5%
Clement & Maynard's....20@20&5%
Rose's Brick....15@20%
Brade's Brick....25%
Worrall's Brick and Plastering....20%
Garden....70%
Cleves' Angle Trowel, ₱ gro, No. 1, $36; No. 2, $30; No. 3, $15. net @ 10%

Trucks, Warehouse, &c.—

B. & L. Block Co.'s list....40%
Thompson Mfg. Co....40%
Barnes' Barrel Trucks....40%

Tubes. Boiler—

See Pipe

Twine—

Flax Twine—

	BC.	B.
No. 9, ¼ and ⅛ ℔ Balls	26¢	31¢
No. 12, ¼ and ⅛ ℔ Balls	22¢	30¢
No. 18, ¼ and ⅛ ℔ Balls	20¢	29¢
No. 24, ¼ and ⅛ ℔ Balls	20¢	29¢
No. 36, ¼ and ⅛ ℔ Balls	18¢	23¢

No. 264 Mattrass, ¼ and ⅛ ℔ Balls, 52@54¢
Chalk Line, Cotton, ⅛ ℔ Balls....25¢
Mason Line, Linen, ⅛ ℔ Balls....55¢
2-Ply Hemp, ¼ and ⅛ ℔ Balls (Spring Twine)....15½¢
3-Ply Hemp, 1 ℔ Balls....16¢@16½¢
3 Ply Hemp, 1½ ℔ Balls....15¢@15½¢
Cotton Wrapping, 5 Balls to ℔..15¢@16¢
2, 3, 4 and 5 Ply Jute, ⅛ ℔ Balls....10¢
Wool....6½¢@6½¢
Paper....13¢@14¢
Cotton Mops, 6, 9, 12 and 15 ₱ to dos..18¢

Vises—

Solid Box....50&10@60%

Parallel—

Fisher & Norris Double Screw....15&10%
Stephens'....25@30%
Parker's....20@25%
Wilson's....55%
Howard's....40%
Bonney's....50%
Millers' Falls....40@40&10%
Trenton....40&5@40&10%
Merrill's....15@20%
Hollands'....35@40%
Sargent's....70&10%
Backus and Union....40%
Double Screw Leg....15&10%
Prentiss....20@25%
Simpson's Adjustable....40%
Moore's....20%
Massey Quick Action....20@25%

Saw Filers—

Bonney's, Nos. 2 & 3, $15.00....40&10@50
Stearn's....33⅓&10@33⅓&10&10%
Stearn's Silent Saw Vises....33⅓@35%
Hopkins'....₱ dos $17.50, 10%
Reading....40&10%
Wentworth....20&10%
Economy, ₱ dos., Nos. 110, $10.00; 120, $15.00....50&10&10&5%

Miscellaneous—

Phœnix Vises....33⅓%
Phœnix Hand Vises....₱ doz $3.60, 33⅓%
Cowell Hand Vises....20%
Bauer's Pipe Vises....10%
Cincinnati....25&10%
Enterprise Pipe Vises....each $3.00, 40%
Massey Combination Pipe Vise....40%

Wads—Price Per M.

U.M.C.&W.R.A.—B. E., 11 up..68¢
U.M.C.&W.R.A.—B. E., 9&10..82¢
U.M.C.&W.R.A.—B. E., 8....90¢
U.M.C.&W.R.A.—B. E., 7....$1.10
U.M.C.&W.R.A.—P. E., 11 up. 1.15
U.M.C.&W.R.A.—P. E., 9&10.. 1.50
U.M.C.&W.R.A.—P. E., 8.... 1.70
U.M.C.&W.R.A—P. E., 7 1.80
Eley's B. E., 11 and larger....$1.70@$1.75
Eley's P. E., 12 to 20....3.00@3.25
Dis. 20&2½%

Wagon Boxes—

See *Boxes, Wagon.*

Wagon Jacks—

See *Jacks, Wagon.*

Ware, Hollow—

Cast Iron, Hollow—

Stove Hollow-Ware—
Ground....60&10@60&10&10%
Unground....65&10@70&5%
White Enameled Ware—
Maslin Kettles....70&10@75%
Boilers and Saucepans....60@60&5%
Tinned Boilers and S'pans....60@60&5%
Rustless Hollow Ware....50@50&5%
Gray Enameled Ware—
Stove....50%
Maslin Kettles....60&10&10%
Boilers and Saucepans....40&5%

Enameled—

Agate and Granite Ware, list Jan. 1, 1889....33⅓%
Ironclad Enameled Ware....dis 33⅓&10%
Extra 10% on some leading articles.

Kettles—

Galvanized Tea-Kettles—

Inch	6	7	8	9
Each	55¢	60¢	65¢	75¢

Standard Fiber—

	Per Dos. Plain.	Decorated.
Wash-Basins, 10¼ in.	$1.80	2 00
Wash-Basins, 12 in.	2.00	2.50
Keelers, 11¼ in.		3.50
Cuspidors		7.50
Spittoons, "Daisy," 8 in.	3.50	4.00
Peck Measure	3.50	
Half-peck Measure	3.00	

See also Pails.

Indurated Fiber.—

Spittoons No. 2, ₱ doz....$6.00
Basins, Ringed, ₱ doz., No. 2....3.60
Washtubs, Nested, Nos. 0, 1, 2 and 3 (4 pieces), ₱ nest....$5.75
Keelers Nested, Nos. 1, 2, 3 and 4 (4 pieces), ₱ nest....$6.55
Butter Bowls 15, 17 and 19-inch (3 pieces), ₱ nest....$1.50
Liquid Measures, pt., qt., 2 qt. and funnell (4 pieces), ₱ set....$1.20
See also Pails.
Extra 10&5%

Silver Plated, Hollow—

4 mo. or 5% cash in 30 days.
Reed & Barton....
Meriden Britannia Co....
Simpson, Hall, Miller & Co....
Rogers & Brother....
Hartford Silver Plate Co....
William Rogers Mfg. Co....
40&25%

Washers—

size hole	5-16	⅜	½	⅝	¾ to 1¾
Washers	5¼	4½	3½	2¾	

In lots less than 200 ℔, ₱ ℔, add ½¢, 5-℔ boxes 1¢ to list.

Washer Cutters—

See *Cutters, Washers.*

Water Coolers—

See *Coolers, Water.*

Wedges—

Iron....₱ ℔ 3½¢
Steel....₱ ℔ 3½¢

Weights, Sash—

Solid Eyes....₱ ton $18.00@$19.00

Well Buckets Galvanized—See *Buckets, Well, Galvanized.*

Wheels Well—

1 in., $2.00 10 in. $2.50 12 in $3.7

Whips

American Whip Co.: Length.	4½	5	5½	6	6½	7	7½	8 ft.
X. L. Whalebone Driving	$18.00	20.00	22.00	24.00	27.00	30.00	33.00	36.00
Eureka, Two-thirds Whalebone	....	....	15.00	16.50	18.00	20.00	....	....
Bull Bone, Half-length Whalebone	....	....	11.00	12.00	13.00	15.00	....	....
American Standard	8.00	8.50	9.50	10.50	12.00	13.50	15.00	16.50
True Grip, Raw Hide Center	6.00	6.00	6.50	7.00	7.50	9.00	....	....
New Name, Stocked Java, Black and Wine Colors	....	....	....	6.00	....	....	....	....
Americus, 93 Fen Whip	....	....	....	6.00	....	....	....	....
Gents' Light Driving No. 111	....	....	....	6.00	....	....	....	....
Gents' Light Driving No. 106	....	....	....	5.00	....	....	....	....
Hand-made Stocked Java No. 103	....	....	3.75	4.00	....	....	....	....

Per dozen.

A large variety of cheaper grades.....50¢@$3.00
Team Whips.....$2.00@$7.50
Toy Whips.....₩ gro. $2.50@$12.00
Hardware Assortment, 10/American, 75 Whips for $50.00.

Wire and Wire Goods—

Iron—

Market,

Br. & Ann., Nos. 0 to 18, 75&10@75&10&5%
Cop'd, Nos. 0 to 18, 75&5%
Galv., Nos. 0 to 18, ₩ 70&5@70&10%
Tin'd, Tin'd list, Nos. 0 to 18.....70@70&10%

Extra 5@10% often given and net prices often made on large lots.

Stone,
Br. and Ann'd,
Nos. 16 to 18.....80%
Nos. 19 to 26.....80&5%
Nos. 27 to 36....82½&5%
Extra 10% often given.
Tinned Broom Wire, 18 to 21, ₩ ℔....43¢
Galvanized Fence .....75&10%
Brass, list Jan. 18, 1884.....40&5%
Copper, list Jan. 18, 1884.....40@5%
Annealed Wire on Spools 60%
Malin's An'aled & Tin'd on Spools..60&5%
Malin's Brass and Cop. on Spools...60&5%
Ossawan Mills, An'ld and Tinned on Spools.....60&10%
Ossawan Mills, Brass and Copper on Spools.....50&10%
Tate's Spooled, Tin'd & Annealed..60&5%
Tate's Spooled Cop. and Brass 50%
Cast Steel Wire 50%
Stubs' Steel Wire.....$6.00 to £, 30%
Steel Music Wire, 12 to 30, imported....60@70¢ ₩ ℔
Wire Clothes Line, see Lines.
Wire Picture Cord, see Cord.

Bright Wire Goods—

Standard list.....85@85&10%

Wire Cloth and Netting—

Painted Screen Cloth ₩ 100 ft. $1.75@$2.00
Galvanized Wire Netting.....75@75&10%

Wire Barb—

See Trade Report.

Wire Rope—See *Rope, Wire.*

Wrenches—

American Adjustable 40%
Baxter's Adjustable "S".....40&10@50%
Baxter's Diagonal.....60%
Coes' Genuine.....50@50&10%
Coes' "Mechanics".....50&10&3%
Girard Standard.....65&10@70%
Lamson & Sessions' Engineers'....60&10%
Lamson & Sessions' Standard.....70&10%
P. S. & W. Agricultural.....
Girard Agricultural.....
Lamson & Sessions' Agric'l..
W. & B. Diamond.....
75&10@80%

Bemis & Call's:
Pat. Combination Bright .....40&5%
Pat. Combination Black.....40 & 10%
Merrick's Pattern.....45%
Brigg s Pattern.....80&10%
Cylinder or Gas Pipe.....45&5%
No. 3 Pipe.....55%
Aiken's Pocket (Bright).....$6.00, 50&10%
The Favorite Pocket.....₩ doz., $4.00, 40%
Webster's Pat. Combination.....25%
Boardman's.....30%
Always Ready.....25&5%
Alligator.....50%
Donohue's Engineer.....20&10%
Eagle.....50&10%
Acme, Bright.....50&5%
Acme, Nickeled.....40&5%
Hercules.....70@70&5%
Walker's.....55&5%
Diamond Steel.....55&5%
Cincinnati Brace Wrenches.....25&10%
Tafts' Vise Wrench.....55&10&5%

Wringers, Clothes—

Am. Wringer Co.'s list, July 1, '93..2% cash
Colby WringerCo., list Sept. 1, '91..2% cash
Lovell Mfg. Co., list July 1, 1892..2% cash
Peerless Mfg. Co., list Feb., 1892..2% cash
National Wringer & Mfg. Co., list June 1, 1892.....2% Cash

Wrought Goods—

Staples, Hooks, &c., list March 17, 1893 85&10@85&14

News and Notes.

Grasshoppers and crickets have made their appearance in such unprecedented numbers in Idaho as to seriously threaten the existence of the crops. Like the Egyptian locust they devour every green thing in their line of march.

A combined electric and inclined railway is nearing completion at Pasadena, Cal., which is to connect Pasadena and Los Angeles with the highest peak of the Sierra Madre range in that vicinity.

The adoption of rubber tires for road vehicles is being strongly urged in various quarters and the idea appears to be favorably received. A company in New York, who have started the manufacture of these wheels, report that they are overwhelmed with orders. Rubber-tired wheels have long been in use in European cities. They serve the double purpose of saving the conveyance from shocks and jars and of being practically noiseless in operation.

Montreal, Canada, is suffering from a blockade of hay, which is being sent down for shipment to England in greater quantities than can be conveniently handled at the wharves.

The Rapid Transit Commissioners in New York City have consented to grant the officers of the Manhattan Elevated Railroad until August 17 to decide whether they will accept the terms proffered to them in regard to immediate extension of facilities and increase of those upon existing lines. It is understood that the Manhattan corporation is unwilling to embark upon further large expenditures during the present financial stringency.

One day's cattle shipments through Denison, Texas, recently, over the Missouri, Kansas & Texas road, amounted to 368 carloads.

What is said to be the largest alternating current electric motor ever set up is being tested at the works of the Hartford Electric Light Company, at Hartford, Conn. It has 300 horsepower, and requires 3000 volts, reduced by transformers to 600 volts.

A glut of the worst kind obtains in the provision markets of the principal European countries, so far as American shipments are concerned. These are stated to have been unprecedented in volume to England, France and Germany during the past few weeks; and as hay and feed are so dear on the other side the imported cattle have been sold for anything they would fetch.

The "Paris" broke the westward record from Southampton on her voyage last week. The time of the American liner was 6 days, 9 hours and 37 minutes.

Agitation goes on in some quarters with the object of continuing the World's Fair for another year.

The Navy Department has formally accepted the cruiser "Detroit," built by the Columbian Iron Works of Baltimore, and has authorized the payment to the builders of reserved funds amounting to about $225,000.

The possibilities of wealth in the utilization of waste was never more strongly exemplified than in the case of cotton seed. Thirty years ago it was thrown away or used as a fertilizer. To-day an industry is based on the material of which the products are worth $27,000,000 a year and which is rapidly increasing. Cotton-seed oil and oil cake are recognized and valued commercial products.

A St. Louis journal figures out the world's wheat crop to be 100,000,000 bushels short of that of 1892.

Crops in the South are reported to be in fine condition, and the yield promises to be greater than that of last year. In 1892 the product was as follows:

Cotton	$332,000,178
Cereals	386,864,500
Tobacco	37,314,550
Sugar and molasses	29,898,650
Rice	10,212,462
Potatoes	17,420,800
Hay	23,647,500
Fruit	25,000,000
Other farm products	233,460,500
Total	$1,095,869,140

The report of the treasurer of the Calumet & Hecla Mining Company's Aid Fund, for the year ending May 1, 1893, has just been issued. It shows the amount of collections for the year to be $20,314.75; amount donated by the company to be $20,314.75; total, $40,629.50. Dividends and interest, $8325.55; unclaimed orders, &c., $90.32; total receipts for the year, $49,045.37; balance May 1, 1892, $23,161.66—$72,207.03. Payments, orders as per list, $31,783.82; 116 shares stock C. & H. Mining Company, $32,653; printing not paid by order, $6.25; cash on hand, $7763 96—$72,207.03. Summary of payments: Paid for sickness, $21,424.70; for accidents (three fatal) $1500; accidents, $8358.90; partial disability, $200; other amounts, $300.22. Statement of funds: Cash, $7763.96; 388 shares stock C. & H. Mining Company cost $91,459.32—$99,223.28.

The general report on the foreign commerce of the United States was published last week. The following table shows comparison of the official figures on merchandise traffic with those of last year and for the two preceding months:

Exports.

	1893	1892.
June	$65,416,367	$64,888,337
May	68,742,612	69,703,479
April	59,874,237	75,954,962

Imports.

	1893.	1892.
June	$75,832,084	$72,016,568
May	79,798,120	68,696,171
April	84,997,522	76,341,449

A Chicago dispatch reports that lake business showed a material improvement on all the principal lines of traffic, and the feeling in marine circles was that business was destined to steadily improve. It was thought that the bottom had been reached, and that there would now be a slightly better figure paid for water transportation, although no one was hopeful that the big promise of a highly profitable season of last spring was to be fulfilled. A Buffalo dispatch states that coal has begun to be shipped again, and that a part of the vessels tied up there waiting for cargoes have secured loads and are moving again. At Duluth, where the Buffalo wheat rate brought the unprecented figure of 1 cent a bushel to Buffalo, there was an advance to 1½ cents.

According to the report of the Secretary of the Treasury the export of corn and wheat from the principal shipping ports was as follows for the year ending June 30:

Corn.

	Bushels.
New York	12,296,243
Boston	3,596,836
Philadelphia	4,252,443
Baltimore	6,524,162
New Orleans	4,265,749

Wheat.

	Bushels.
New York	39,519,574
Boston	3,806,878
Philadelphia	9,424,410
Baltimore	14,218,961
New Orleans	14,290,360

The New York *Press* asserts that $345,000,000 of American capital has been invested in business enterprises in Mexico during the past three years.

Owing to change of printers, two issues of the *Patent Office Gazette* have failed to appear.

Sixty-seven new canning factories were established in the South during the first half of this year.

THE METAL WORKER.

NEW YORK AND CHICAGO.

Saturday, August 5, 1893.

DAVID WILLIAMS, - PUBLISHER

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CINCINNATI.....Rooms 22-24 Pickering Building.
ST. LOUIS.....Bank of Commerce Building.
CLEVELAND.....312 The Cuyahoga.

BRITISH AGENCY: The Ironmonger, 42 Cannon street, London, England.

The index for *The Metal Worker*, Volume XXXIX, January-June, 1893, is now ready and may be obtained on application to David Williams, publisher, 96–102 Reade street, New York; or to 220 South Fourth street, Philadelphia; Room 509, Hamilton Building, Pittsburgh; 59 Dearborn street, Chicago; Rooms 22–24, Pickering Building, Cincinnati; Bank of Commerce Building, St. Louis; 146 Franklin street, Boston; 312 Cuyahoga Building, Cleveland.

Discouraging Outlook for Business.

The business situation steadily grows more unsatisfactory. Trade is shrinking in every direction, and all branches of business are participating in the distress which envelops the country like a dismal fog. The wail of the unemployed is heard on all sides. Factories are idle that had not been known to close except for repairs within the memory of the present generation. Towns that have never before felt the blighting touch of adversity are struggling with the problem of feeding the hungry, who almost outnumber the fortunate ones still blessed with employment. In a manufacturing city in the central West, possessing diversified industries in such an advanced state of development that its prosperity seemed founded on a rock-rooted basis, there is at present not a single establishment of any moment in operation, and a loaf of bread is not to be had on credit. The inhabitants have seen paralysis affect one industry after another, and they now understand for perhaps the first time in their experience what is meant by hard times. No relief is to be had by tramping to some other locality where there may be factories in operation, because those are probably running on half time or with a reduced force, and there is no chance for a stranger.

Solvent Bankrupts.

It seems like mockery in such a time as this to say that the country is really in a sound condition and that the distress is of an artificial character. But was there ever seen in the history of the world such a series of financial reverses among really solvent institutions? Manufacturers fail with assets largely in excess of their liabilities. Banks go to the wall with their safes filled with good securities. Merchants close their shutters because they are only in need of a comparatively small amount of cash to discharge pressing liabilities. In the throng of insolvents there are, of course, not a few who had attempted to carry too heavy a load for their capital, but this country can now show the most remarkable collection of solvent bankrupts ever seen under the canopy of heaven. Business men of all kinds have taken refuge in receiverships, that they may secure the protection of the courts in saving valuable properties that would be ruthlessly sacrificed in this crisis. There appears to be no value at present in any kind of property whatever, and to offer it for sale means to instantly depreciate it enormously.

Needs of the Currency.

The restoration of values appears to be a simple matter and to lie wholly with Congress. The early repeal of the Sherman act and the authorization of a bond issue to increase the gold reserve, thereby insuring the maintenance of our silver currency on a par with gold, would impart confidence to the people at once, and the further hoarding of money would be checked. It will, of course, require some time for trade to resume its wonted course, as the disturbance to business has been very great. There may also be some halting in certain branches of industry and commerce until it is definitely known what changes may be made in the tariff schedules. But the first thing necessary to check the awful demoralization in the business of the country is to re-establish our currency on a sound basis. To this end all patriots should earnestly work, and partisan cries should be stifled until it is accomplished.

The Blower System and the Tinsmith.

The introduction of the blower system of heating and ventilation has opened up a new field to the tin and galvanized iron worker. The extended systems of piping required for the air distribution by this method generally consist of pipes and ducts of such size as to make galvanized iron the best material for their construction. These pipes will vary from 5-inch to 6-inch for branches up to 50 inches and 60 inches for the mains, and in aggregate weight for a single apparatus will run from 2000 pounds for a small or medium plant up to 20,000 and 30,000 pounds for some of the largest. While the majority of this work is comparatively simple in character, yet considerable skill and experience is required in laying out and making transition and complicated outlet pieces. For the better class of installation, rectangular pipe is employed to a considerable extent, these ducts or flues running flush either between floor timbers or inside partition walls. In the application of the system to old buildings, such as manufactories, the complication of belting and shafting frequently throw upon the metal worker the responsibility of successfully putting in place the piping that the draftsman has only been able to roughly locate.

Home Application of Tight Money.

The young wage earner with steady employment naturally does not feel the much talked about money trouble and gives it little heed. A search for its existence, however, will be advisable as a matter of information that will be valuable. Though a thorough understanding of money in its broadest sense will not be gained from the first inquiries, the search will show that the wage earner, as an article of trade, is among the first to feel retrenchment in the business world. It will be learned that whenever the commercial outlook is not promising a cutting down of expense follows, and that a good portion of the saving is effected by paying out less for wages and by laying off some workmen. From a study of the past and a talk with old workmen it will be found that financial depression and its disagreeable attendants are experienced several times in a workman's life. Those who make no provision to pass through such times suffer many privations, and instead of profiting by their experience when employment is again found they far too often are embittered by their trials and continue improvident.

Live Within Your Income.

Continuing the same line of thought an excellent example is set by those who have accumulated one or two fortunes, yet are reducing their expenses so as to live well within their income, in order that their principal may remain untouched and they need not ask for credit, which is hard to get in hard times. The wage earner, to follow a similar course, would set aside each week one, two or three days' earnings for investment to provide for emergencies. Another worthy ambition would be to develop a skill in handicraft and acquire a knowledge of their trade that would insure employment in any condition of business. To live well at small cost is a problem

worthy of solution and should be studied until it becomes a simple matter. Examples are common of those who have solved this problem and have met expense in sickness, accident and lost time, and have lived well in every way, and yet, after a period of years, have a neat sum invested or have a home. In times like the present every earner of wages should study and profit by the experience of those who have safely weathered former periods of depression.

Wit and Lack of Wit.

The proportion of those who live by their wits in this country appears to be on the increase. In this class it is not intended to include gross criminals. As the country gets older, and competition in trade grows sharper, as the making of a good living by straightforward methods becomes more laborious, those who will seek to shirk the burdens imposed by increase of competition will naturally become larger. One needs to look only into the history of civilized countries and study statistics of fraud and of current criminal records to be convinced of two things: First, that, as to live honestly requires more stringent effort and greater self-sacrifice, the more will a certain class of men and women be diverted into crooked ways in the endeavor to evade their share of the world's honest work. So long as there seems a possibility of their maintaining themselves by fraudulent practices easier than by working the ranks of this class will be filled. Second, it will appear that there is another class that are also seeking to evade work, or at least seeking to make their lives easier by speculation, and become easy victims to the tricks of sharpers.

The Dupes.

Those who live by their wits would find it harder to provide for their wants and wishes in this manner than by honest work were it not for the lack of wit in others. It seems that schemes for obtaining money of witless people prosper in proportion to the inherent improbability of the statements and promises made to allure their victims. Reasonable assertions do not attract; it is the promise of enormous, impossible gains that draws these moths into the flame that burns off their wings. An offer of a dollar for every dime invested, loaded with the almost certain risk of total loss of the original investment, will oftener find takers among this the never failing army of the gullible than one of a profit of 10 cents on a dollar invested with reasonable assurance that the promise will be performed and with scarcely any risk of loss, even if the profit expected be not fully realized. What wonder, then, that the annual crop of simpletons should invite harvesters, since it appears an easy and profitable field for enterprising sharpers, and since this field extends through all classes of society, from highest to lowest?

Sanitation and the Churches.

The social work of the churches in laboring to advance the physical well-being of the masses in great cities is a feature which is coming more and more to the front. It is recognized that a great barrier to success in work among the poor and neglected is in their unclean and unwholesome environments, in the unattractive and unsanitary surroundings of the places where they dwell and work and sleep. To improve these conditions is a specific work that certain religious bodies and isolated workers in the interests of the churches have resolutely set out to do. A favorable instance of labor in this field is found on the other side of the water. The Church of England Sanitary Association is an organization which has for some time been steadily doing a praiseworthy work in the British Isles. Some of the most influential and practical of the clergy are enlisted in the ranks of the association, the object of which is the furtherance of every measure which shall improve the sanitary conditions of the homes of the poor in the various parishes in which the society is represented. Its labors in the East End slums of London in bringing to light and knowledge dangerous and unwholesome districts which have escaped the more perfunctory sanitary inspector's eye have been very fruitful. The association, which is made up of common-sensed, practical individuals, who know from experience better than almost any other class of men the miserable conditions under which the poorest live in the cities, numbers among its workers and counsellors some of the best-known sanitarians and scientific engineers of the country, who lend it hearty aid. By its means many useful measures for the improvement of the dwelling houses of the poor have been furthered and carried out. Personal influence is also brought to bear on those they seek to benefit. Cleanliness and sweetness, and subsequent morality and happiness, have been brought about in many quarters through the sanitary crusade of these sensible philanthropists.

Both Sides of the Counter.

BY F. S. L.

There has been considerable said and written regarding the amenities of the retail trade and much advice offered, chiefly to the inside of the counter, as to the proper and especially the profitable treatment of possible customers, which doubtless has resulted to the moral and financial advantage of those dealers who "live to please" because they must "please to live." Perhaps the outside of the counter may have been neglected too much in the distribution of trade pointers and this may warrant our acceptance of a mental call to sit judicially "on the counter" with words of wisdom (?) for the parties interested, but bearing in mind, as above stated, the proportion due to each. We have to accept the fact of an irrepressible conflict between buyer and seller which does not exactly accord with the teachings of the Golden Rule.

This manifests itself in a sort of diplomacy which is *lie*-able to deceive, but does not always show itself in oral prevarication and is likely to hide selfish motives behind words which at best are but half truths.

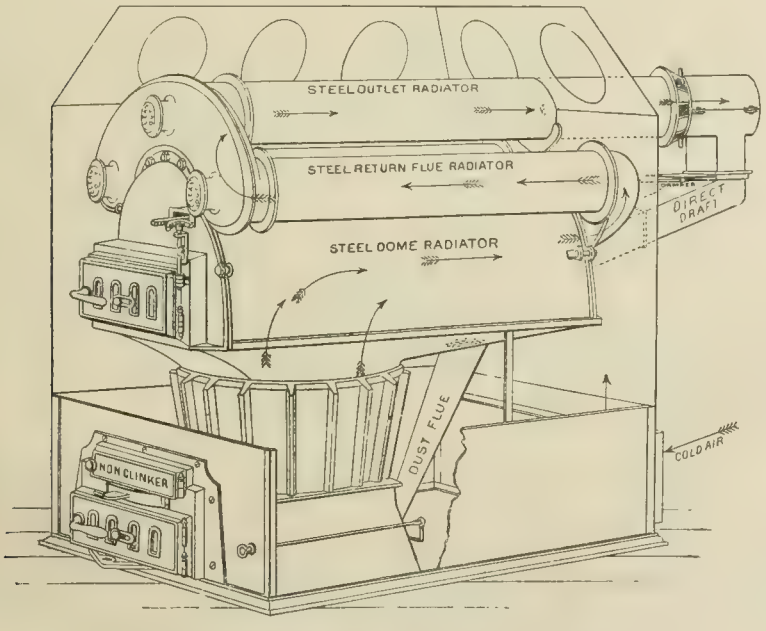
We may infer that Solomon the Wise was, by reason of his extensive feminine connection, quite familiar with outside-the-counter remarks, and his "It is nought, it is nought, saith the buyer, but when he is gone his way then he boasteth," was a record of experience which has been and is now common to all. Mrs. Solomon—in the plural—was an antitype of many of the present generation who will not purchase even a necessity without condemning the seller's goods in order to get a reduction in price. When Mr. and Mrs. Skin Flynte are obliged to put a new stove in place of the old inherited and played out one their minds are made up, or at least hers is, to get the "Cream of the Kitchen," because that is highly recommended by sundry sisters, cousins and aunts. In vain do Rostem & Co. talk of the merits of their wares. Mrs. F. will have none of them, and is firm in the belief that a seller of stoves knows less about them than a user. Having found the only place in their locality where the "C of K" may be procured, they (Mr. and Mrs. F.) immediately compare it unfavorably with "that one we saw at Rostem's" which was of the same price, but "better looking and a leetle bigger." Of course the stove is bought as was intended, and its merits extolled to visiting neighbors with the self-approbative remark that "I made him throw in a poker, and a rattlebox for the baby."

We think a little of "put yourself in his place" would be good for both sides of the counter; the buyer realizing that the fact of carrying a stock of goods for him to select from warrants a profit on their sale, and the dealer feeling that the same fact gives him a right to so-called patronage. As a rule, the inside of the counter is the most humble servant of the outside, and to be waited on implies a servile acquiescence in all the unwarranted demands often made upon the dealer's time, patience and temper. Sometimes the airs that patrons put on are resented, as in a case that comes to memory. It was in a country store where a general stock of assorted merchandise was kept. One day when trade was extra good a man asked the boy clerk to give him change for a $5 bill, to which the clerk objected, saying that the little in the cash drawer would be needed for customers. "What is the price of that?" said the man pointing to an article. It was immediately laid on the counter with the answer, "fifty cents." "I will take it," said the man, "and now" (with an oath) "you'll have to change the bill." "Hold on," said the proprietor, who had seen and heard the transaction, "we don't have to do anything of the kind under compulsion. The article is not for sale to you, and we won't change your bill." Of course that man's present and prospective patronage was lost but not regretted.

It has been said there are no friendships in trade, but it does not follow that there may not be mutual confidence, although as that is a plant of slow growth it will be a long time before it flourishes across the counter, replacing the prevailing distrust which makes small trades a skirmish and larger ones a campaign. Both parties may be free from direct deception, yet each will allow the other to make self-injuring mistakes, with the after comment that "I look out for myself and others must for themselves." A lady came to a dry-goods store with a sample of cloth she wished to match, which the clerk could do in color but not in quality, thus losing the sale. The boss said, in reprimanding the clerk, "Why did you show the best piece first?" "Because it was most like her sample." "Next time begin with the coarser goods and afterward show the finer and better, which will then appear more so to a customer." Will the reader please estimate the moral,—not mercantile—value of that advice.

The Miller-Monitor Steel Dome Return-Flue Furnace.

The Wm. Miller Range & Furnace Company, Cincinnati, Ohio, are making the furnace shown in the illustration. Consistent with the disposition to use larger quantities of air, to secure comfortable temperatures, the square or rectangular shape is said to have some advantages. From the illustration a good idea of the construction and operation may be gained. The fire pot presents a large heating surface by means of extending flanges. It is located near the front, on the ash pit, which is provided with a dust flue, which opens near the direct-draft passage. The grate is a patent of the draw center, anti-clinker style, with which a poker can be used if desired. The section above the fire pot presents several novel features intended to secure an absolutely gas proof furnace and to extract the greatest possible heat from the fuel consumed.



The Miller-Monitor Steel Dome Return-Flue Furnace.

The lower radiator, which sets in a secure joint on the top of the fire pot, is a heavy casting in one piece, designed in a special manner to receive the steel dome and its cast-iron heads.

The connections between these parts are made secure by the shape, the packing and the re-enforcements. Connecting with the rear dome head are two steel plate return-flue radiators, one on each side, connecting with a crescent flue head at the front, where they merge into an outlet radiator, which connects with the smoke pipe at the rear. The rear dome head has a direct draft outlet, which is connected with the feed door by a rod and a contrivance which opens the damper when the door is opened. The erection of the outside casing is very simple, and, being of galvanized iron lined with non-conducting material, but little heat is lost. At the rear is a large opening for the air supply, which is distributed through the furnace over the heated surface by means of properly located guide plates. The furnaces do not stand high, and good ascent is gained and ample opportunity for a large number of pipes afforded by the long flat sides and ends, to which hot-air collars may be attached.

Anthracite Coal Bricks.

The London *Times* contains a description of a new industry which may obtain a hold in England—an industry which is likely to benefit the community at large, and which will utilize a great amount of what has hitherto been considered waste material. This is the manufacture of what are called "briquettes," being small blocks of fuel made from coal dust, cemented by a special compound and prepared under great pressure. These are said to have not only a greater heating power, but also to give off a less quantity of smoke than usually results from the combustion of coal in the raw condition. They can be made either from anthracite or other coal; but the former is preferred on account of its smokeless character, especially as the bricks are particularly recommended as a cure for the smoke nuisance and London fogs. Owing to its non-bituminous nature, difficulty has been hitherto experienced in burning anthracite in London, except under special conditions, and this has proved a barrier to its more extended use. This difficulty now appears to be overcome, and the fuel is offered in a form in which it can be universally used. In this block fuel the grains of dust are made to adhere by a cementing compound which is the secret of the syndicate who are operating the invention. The manufacture of artificial fuel from coal dust is, of course, not new, pitch being used as a binding material. Pitch, however, carries with it the disadvantages of burning slowly and giving off offensive fumes. Other cementing substances which have been tried have all been placed in the category of failures or only partial successes. At length, however, a cementing material is said to have been discovered which is the very opposite of pitch, being a dry powder. This powder is composed of two natural substances, which are both cheap and abundant, and which, moreover, give out no noxious fumes during combustion and have no deleterious effect on the flues or plates of steam boilers.

MANUFACTURE OF COAL BRICKS.

The process of manufacture of these coal bricks as carried out at Robert Middleton's works, Sheepscar Foundry, Leeds, England, is described as simple and inexpensive. The coal dust is mixed with the binding material in the proportion of 96 per cent. of the former to 4 per cent. of the latter. The compound is fed into a mixer, where it meets a jet of steam, a stiff paste being formed, which is delivered successively into a series of molds under a pressure of 25 hundredweight. As the mold plate revolves the charge in each mold is brought between two rams, which exert a pressure of 2 tons per square inch on each side of the charge, forming a very dense and homogeneous coal brick. The brick, still in the mold, passes on to the delivery ram, by which it is pushed out on to a table and is removed for the market. These coal bricks are found to make an excellent fuel and to possess a very high efficiency for steam-raising purposes.

TEST FOR STEAM PURPOSES.

A practical test of the fuel has been made at the Atlas Steel Works of John Brown & Co., Sheffield, which appears to prove conclusively its value in this latter respect. The bricks were made from American anthracite coal, as used by the Inman Company on their eastward voyages, and the test was rendered comparative by using anthracite also in its natural condition, the same boiler being employed in both trials. According to Messrs. Brown's report, the total horse-power developed by the boiler with the natural anthracite was 368.1, while with the bricks it was 506.6. These figures are based upon the Admiralty rule of an evaporation of 20 pounds of water per hour being equal to 1 indicated horse-power. The importance of this result will be seen by practical men, while shipowners will recognize the value of a fuel which can be stowed conveniently away in square blocks. So highly do Messrs. Brown & Co. appreciate the invention that they conclude their report by expressing the opinion that, if very small American coal dust could not be obtained at a reduced price, it would pay the large steamship companies to have the natural coal ground small and made into bricks. The manufacture of these bricks is, of course, not restricted to anthracite, as the ordinary coal dust, of which many thousand tons are lying waste at collieries, can be similarly utilized, as also can coke. With such a fuel as that under notice, says the *Times*, there is room to hope for a reduction in the pollution of the atmosphere of towns as well as a reduction in the coal bills of our steamship companies and of steam users generally. The invention is being worked by the Coal Brick Syndicate of 2 Trafalgar Building, Northumberland avenue, London.

There are no trades unions in India. The workmen are, however, said to have in many instances a common understanding, an unnamed and unwritten bond of union, peculiar to themselves, by which the labor remuneration in various trades is generally regulated. No strikes or lockouts of general importance have occurred in India, and nothing in the nature of disputes involving organized action on a large scale between labor and capital.

The Irish "bull" is still rampant. A Dublin paper recently explained why there was not more cheering for the royal bride and bridegroom at the recent wedding in London by saying that the hot weather chilled the enthusiasm.

THE LETTER BOX.

How to Line a Tank.

From B. H. T., *Wisconsin.*—Having a tank to line I apply to the Letter Box for information. The tank is made of wood and is 4 feet square and 8 feet high. I have never done any work of this kind, though I am a tinner and have done all kinds of work at the bench for 15 years. Shall I use copper or lead, and how heavy? If lead is used, how must it be supported to prevent bulging and sagging. If I use copper, will a good lapped and soldered seam answer, or should it be flat seamed, as in roofing.

Note.—It is inferred from the letter that expert work can be done with a soldering copper, while tools for either lead burning or seam wiping could not be manipulated; consequently, though the first cost is greater, it will be better to use sheet copper that is tinned on one side and weighing 16 ounces to the square foot. Owing to the difficulty in soldering upright seams they will be avoided by commencing to line the tank at the top. Put together enough sheets of copper to make a piece that will cover all four of the inner sides of the tank neatly after the ends have been seamed and soldered securely, making a big cylinder. Before the last seam of the cylinder is made turn a flange an inch wide out at the top to be nailed to the wood and a narrow edge in at the bottom to receive a similar edge on the top of the next sheet to make a seam that can be easily soaked with solder. Both the flange and the edge should be notched at several places to permit the cylinder to be folded for handling to get it into the tank, or else they may both be turned after it is in the tank. When the cylinder is in the tank it can be fitted into the corners by driving a piece of square hard wood against the metal at the corners. After it is fitted and nailed at the top see that the edge turned at the bottom is in good condition and put in the next cylinder, getting the top edge over the edge on the sheet that is in place, then flatten the seam carefully with a mallet and proceed till the bottom cylinder is reached. On the lower edge of the bottom cylinder turn a flange in 1 inch and be sure that this flange rests on the bottom of the tank. On this flange turn a narrow edge, to which the bottom is to be seamed. Putting in the bottom is a simple matter. Now solder all the seams, thoroughly soaking them, and, as there are no upright seams, this will not be a difficult job. No nailing is necessary, except around the top of the tank, unless a few nails are used here and there for convenience. If the tank was so situated, and of such a size that it could be readily turned on its side, the job would be comparatively simple. If lead is used it should weigh not less than 4 pounds to the square foot and have a lap of at least ¼ inch if it is to be soldered with a copper. It is nailed to the wood with small-headed tinned nails 1 inch long 2 or 3 inches apart. For ¼ inch each side of the lap the lead should be scraped bright to take the solder freely, whether from a copper or wiped on. Lead comes in such widths that a seam around the bottom and one in each corner would be all that would be needed in a tank of the dimensions given. To prevent sagging or bulging sometimes several nails or screws are put inside of a small circle and a piece of lead soldered over them, which is called a "bull's-eye." Nails 15 or 18 inches apart, with their heads securely soldered over, will hold the lead in place. It is impracticable to attempt to properly solder with a copper an upright seam in sheet lead, and it is very difficult to solder cross seams. Even if the tank could be turned to permit soldering the lead would tend to drop away from one side while soldering the other. Consequently, if a plumber cannot be secured to wipe the seams it will be better to use copper.

A Water Back Question.

From G. W. J., *Farmington, Ill.*—In answer to "W. F. S.," Bayfield, Wis., whose letter appeared in *The Metal Worker* of July 8, I would advise him never to try to use a coil water back or cast water back. Instead, let him use a coil water front made in the following manner: Run three pipes in front with close bends. Then at the opposite ends of the fire box from the boiler run pipe across the end fire box to center of long T center. Then turn to boiler, letting the pipe hug to T center, to give the draft over the oven plate all the space possible between the pipe and plate. Also give gradual rise to all coil pipes. Three-quarter inch pipe is large enough for a 30-gallon boiler, though the size of the pipe depends upon how much room there is between the oven plate and T center. Good judgment is all that is required.

Warming a Church.

From W. B. & Co., *Bangor, Maine.*—We notice in *The Metal Worker* of May 20 a plan of setting a church furnace. It does not seem right to educate the young men of the nineteenth century to set a furnace in a church so that a great part of the heat shall be wasted before it can pass into the church. We give the description of a method which we think practical furnacemen will concede takes at once all of the heat in the church. Place a 36 x 36 hot-air grate in the middle aisle of the church a little more than one-third of the way from the entrance and place the furnace directly under it and connect with a 30 inch pipe. The air then passes into the church and is distributed much better than it can be by four pipes. Exhaust registers, 16 x 20 inches, should be placed at each end of the church about equally distant between the middle and west aisles. We have, in the last 40 years, taken hot-air pipes out of a great many churches in this cold climate and have never failed to warm them satisfactorily when the furnace is set under a hot-air grate suitable to pass all of the heat into the church. Registers should never be used in a church, for if all are closed there is considerable danger of fire, and hot-air grates avoid any such contingency while presenting less resistance to the air current.

Calking Soil-Pipe Joints.

From D. B., *Passaic, N. J.*—Will you kindly give one of your old subscribers information on the following qustion: How much metal is required to calk the joints in 2, 3, 4, 5 and 6 inch soil pipe, both light and heavy?

Answer.—Lead is generally used for calking the joints in soil pipe and the table below gives the average weight of the lead used and the depth of lead packed in the joint, as reported by a number of practical plumbers:

Light Pipe.

	2-in.	3-in.	4-in.	5-in.	6-in.
Weight, pounds....	½	1	2	2½	3
Depth, inches... ..	1	1	1½	1½	1½

Heavy Pipe.

	2-in.	3-in.	4-in.	5-in.	6-in.
Weight, pounds....	¾	1½	2½	3	3½
Depth, inches.....	1	1	1½	1½	1½

It is generally conceded that the oakum packing under the lead should be done carefully and that it cannot be rammed too tight. The oakum packing should be ½ inch thick all round and driven down until it is as hard as lead. To do this properly the calking iron should nearly fill the space in the hub and be very heavy above, so it will not spring, particularly if it has an offset, and this applies to the irons for the lead as well. In pouring the lead in the joint some plumbers pour it full the first time and then calk once for all. A claim is made that a better way is to pour ½ inch of lead in the joint, and, with a full-size iron, drive in down hard; then use red-hot lead to fill the joint, letting the lead swell up above the bell as much as it will and then calk it down tight and flush.

Paste for Asbestos Paper.

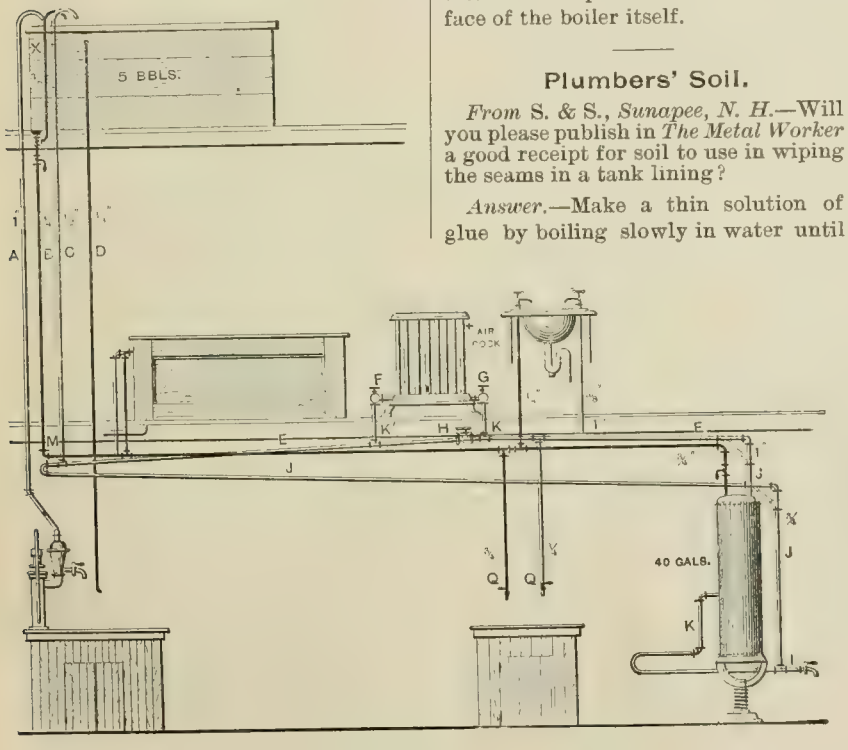
From M. J. H., *Williamsville, N. Y.*—Can *The Metal Worker* or some of its readers inform me what kind of paste is used for applying asbestos paper to furnace pipe? I have used flour paste, but mice destroy the paper and the fastening to get the flour.

Note.—Some furnacemen use Portland cement, as it sets quickly, and they roughen the surface of the paper before applying. Silicate of soda is used by some, mixed with Portland

cement. It is quite probable that this problem has been solved by some of our readers who can give a receipt which will avoid the labor of wiring and give the covering a neater appearance.

Heating Bathroom From Range Boiler.

From J. I., *New York.*—I send you herewith plan of a job I have to do, and wish to know if I can heat a bathroom 5 x 12 feet with radiator connected with the range boiler, as shown on the plan. You will notice that E is a 1-inch circulating pipe, being run beyond the radiator as far as the return bend M, the return J from there to boiler being ¾ inch. I propose to open F and G and close H to heat the bathroom, and reverse this to keep the bathroom cool in summer. C is a



Heating Bathroom from Range Boiler.

½-inch expansion pipe from the circulating pipe E, D a ⅜-inch telltale pipe, A 1-inch supply pipe from pump to tank and N circulating pipe to water front.

Answer.—To heat the bathroom specified our correspondent will need about 12 square feet of radiator surface. A water back or water front can usually be relied upon to carry about 50 to 60 per cent. more radiator surface than the surface of the boiler adapted to use with it. The exact relation of the heating surface of a front or back to the amount of radiating surface it will carry has not been determined, so far as we are aware. To carry with efficiency an amount of radiator surface of 50 per cent. more than the surface of the boiler itself the boiler must be covered with felt or some other non-conducting material, as, otherwise, much of the heat from the water will be imparted to the air and other objects in the room in which the boiler is placed. The plan, as shown by our correspondent, has been well schemed out, as a whole and will probably work nicely if he uses an open return bend at M, and instead of the right-angled elbows at the tops of the pipes J and J′ uses 45° elbows and gets easy turns of the current in the pipes at these points. He should endeavor to get an easy upward inclination of the supply pipe from the top of the pipe J′ to the tee marked K, and a corresponding downward pitch from the tee K′ to the return bend at M. The inch supply pipe should be large enough for a radiator of the size named if unnecessary obstructions are not introduced. Of course, if the amount of surface proposed be used for heating the bathroom the amount of hot water that the boiler can supply for other uses will be materially less than it could furnish were the only means of escape for heat to be the surface of the boiler itself.

Plumbers' Soil.

From S. & S., *Sunapee, N. H.*—Will you please publish in *The Metal Worker* a good receipt for soil to use in wiping the seams in a tank lining?

Answer.—Make a thin solution of glue by boiling slowly in water until entirely dissolved. Then stir in lampblack sufficient to make the mixture of the consistency of paint, simmering the compound over a slow fire for 15 minutes. To test it, paint a space on a piece of pipe and rub it briskly with a dry finger; if it rubs off easily add a little glue, but if it sticks and takes a slight polish it is good.

Loss of Water From Boiler.

From J. & R., *New York.*—We have had a very curious experience with some hot-water heaters, and would be glad if any of the readers of *The Metal Worker* can assist us with an explanation. We want to know where all the water goes to in hot-water heating. We have put in two different heating plants, using different boilers in each case, but the house owners were compelled to be continually pouring in water. Sometimes the entire plant had to be refilled. It was impossible to find any leak or waste, and we are consequently very much puzzled to know where the water went to.

Note.—We presume from our correspondents' complaint that the refilling was frequent and the waste could not therefore be accounted for merely by the evaporation in the expansion tank. Many apparent inexplicable questions have been cleared up by our readers, and if they can assist in this instance we will be glad to hear from them.

Problem in Hot-Water Fitting.

From F. V. S., *Lancaster.*—Can you tell me whether the system shown by the inclosed drawing is practical? I have a number of water jobs and would like to use it, having seen it set up where it seemed to work well, but having learned a great deal from *The Metal Worker* would like to know its opinion of this case.

Answer.—The drawing shows a boiler with flow and return pipes running around a cellar, and at one point two Y-fittings are so placed that the hot water easily flows through one into a pipe to a radiator on a floor above, and the return from the radiator enters the main return through the other Y with little friction, and the system should work freely. The drawing is defective and may be intended to show the boiler and radiator on the same level, in which case there is an uncertainty of its working properly.

Trouble With Hot-Water Circulation

From S. B. R., *Haverhill, Mass.*—Please inform me why the hot water does not circulate in the following job: The bottom of the boiler is 18 inches below the water back. The hot-water return pipe has a slight sag between the water back and boiler. The hot-water supply from the top of boiler first runs down to the cellar, then along the floor timbers and then up-stairs again. A branch pipe is taken from the pipe down-stairs to basement sink. I know that a sag in a pipe will cause thumping in a boiler, but will it stop the circulation? If not wholly, to what extent? As a remedy to make the water circulate I propose to raise the boiler somewhat and straighten out the sag in the pipes, and also change the piping so that the hot water supply pipe runs up-stairs first and then return it to the basement sink. There has been some difference of opinion as to whether or not my plan is correct.

Answer.—A careful reading of the letter of our correspondent leaves little doubt as to the cause of the trouble. As to the changes suggested, we fully agree with our correspondent, although it may not be imperative that the boiler be raised if the cold-water supply has adequate pressure. A slight sag in the return pipe will not entirely stop the circulation, but it tends to impede it more than is generally appreciated. The proposed change of the hot-water pipe from the boiler, leading it up-stairs first and then down to the basement, is correct.

Tobacco Drying Apparatus.

From T. A. S., *Tennessee.*—Will the readers of *The Metal Worker* help me out with information on an apparatus for drying tobacco in barns? We are beginning to have calls for something for that purpose in this section and do not know what is being used. If there is some special heater in the market that requires to be put up in a special way we would like to hear about it.

Interpreting a Roofing Contract.

From O. & K., *Ohio.*—We would like to have your opinion and the opinions of some of your subscribers in regard to laying a tile roof. The following is a copy of the specifications: "Cover all roofs with first quality shingle tile, laid with proper lap Wherever necessary it must be pointed up with cement mortar the same color as the tile and to be made water tight. The tile to be underlaid with a course of heavy roofing felt, to be storm proof of itself. The tile laid in cement where necessary." The manufacturers sell no more than 2 inches to the lap and say that is the proper lap, and that the words "cement wherever necessary" means up a valley, around a skylight, scuttle hole or chimney and all such places where tile have to be cut in order to make them fit. The architect seems to think he has the right to interpret the specification to mean that the roof must have 3-inch lap and be laid in one solid body of cement.

Note.—The decision of the question presented depends upon two questions of fact, namely, whether it was necessary that the roof should have a 3-inch lap or a 2-inch or less lap, and whether the words "cement wherever necessary" mean a solid body of cement or only cement in certain places, such as around a skylight, &c.

The contract calls for a "proper lap," and the use of the word "proper" in a building contract has always caused great uncertainty and dispute, and frequently litigation. The legal principle which can be deduced from all the decisions of the courts on this subject seems to be that the work must be done in accordance with the usual best custom. As applied to this case, there must be no careless, or possibly imperfect, work; there must be no undue economy of material; and if it is the custom to lay the tile with a 3-inch lap in the same kind of houses, that custom must be followed. What the manufacturer of the tile says about 2 inches being sufficient is, of course, important, and it is the strongest kind of evidence that 2 inches is the proper lap, if they all, or many of them, manufacture their goods on that basis. At the same time their decision or opinion is not final. If it can be shown by the architect that for any good reason a 2-inch lap is not proper in the particular case, and if that could be made to appear to the satisfaction of a number of men, such as a jury, for instance, then the terms of the contract call for the 3-inch lap. The ultimate and final appeal in questions of this kind is, of course, to a court, and the question in each particular case can only be settled by a verdict. "O. & K." fail to state any reason advanced by the architect for his opinion, although it would seem that the architect must have some reason, more or less plausible. With only one side of the case before us, therefore, it is impossible to venture any definite opinion as to the merits of the question.

The question as to the cement depends for its answer very largely on the same principles. Who is to be the judge of what kind and amount of cement is necessary? It would hardly seem reasonable to insist that the whole roof should be laid in one solid body of cement, and yet such might be the case in any particular instance. The fact, however, that the language used in the contract merely calls for cement "wherever necessary" would seem to imply that in this case it was clearly considered that there would be places where it would not be necessary. The intention in the minds of the parties to the contract was very likely what "O. & K." state—namely, that the cement work should be confined to places such as chimneys and skylights. If it could be shown that it is unusual to lay the roof in one solid body of cement, these two facts taken together are practically convincing, as against the contention or claim of the architect. Some contracts provide that the architect shall have power to decide what is "proper" and "necessary." Some contracts give architects almost unlimited power as to the construction of the specifications, and if both parties have agreed to abide by his decision there is, as a rule, nothing to do except to comply. If such a clause is embodied in this contract it would clearly affect the question very materially.

Altering Roofing Contracts.

From G W., *Lockhaven, Pa.*—I would like your opinion on the following: I agreed to put on a roof of Best Bloom galvanized iron at a certain price. The roof was to be plain standing seam, without hips or valleys. When I came to lay it, however, it was partly plain, but the main roof had four hips and six valleys, and the question is, Can I make the owner pay for the extra labor on that part? My contract was only verbal, and he has paid me part on it. The job is not yet completed, and I have not yet said anything to him about it. I would like your opinion and the opinion of some of your readers in this matter.

Answer.—It seems to us that it was the duty of "G. W." to notify the other party to the contract that the roof was different from that described and called for by the contract, and therefore that the price would be higher. "G. W." was employed to make a certain roof at a certain price. He was not employed to lay a different kind of roof at any other or higher price. In other words, he had no contract to put on the roof he did. The fact that the structure of the building necessitated a more expensive roof gave him no right to go ahead without notice. The course a prudent business man would usually adopt would be to inform the other party that he could not proceed with the contract at the price fixed upon, and also inform him what the increased price would be, stating at the same time the reason why the work would cost more. The other party could then decide whether he would have the work done or not. In case considered, if he determined not to give "G. W." the contract, the latter could nevertheless hold him for any damage or loss of profit which he might have sustained. This is the plain law of the case. Of course, as a matter of fairness, the other party, who has been benefited by the extra work, ought not to refuse to pay a reasonably extra sum, but it is open to question if he could be compelled to do so.

Hot-Air Heating.

From G. P., *Victoria, B. C.*—I take the liberty of sending you a cutting from the Victoria *Daily Colonist*, respecting certain heating contracts that have been given out. In it you will notice the following sentence: "2. Many eminent hygienic authorities condemn the use of hot air absolutely for schools, asylums and hospitals." What I want to know is, suppose that certain particular systems are failures, does it follow that all hot-air heating, according to the architect's idea, is also a failure?

Note.—To condemn hot-air heating in the broad way mentioned in the clipping sent us by our correspondent, is, we think, going beyond all reason. There have been many instances of failures in hot-air heating, and there have also been many instances of failures by steam and hot-water heating. The three systems are alike in one essential particular, they transfer the heat from the coal, or whatever fuel is used, to the air of the house. It may be done by a radiator over a hot-air furnace, by indirect stacks in the cellar of houses heated by steam or hot water or by radiators in the apartments of the building. In the latter case there is a certain amount of warmth due to the direct radiation from the radiator. Leaving that out, however, the heat is due to the higher temperature of the air. It makes no difference how the temperature is imparted to the air, provided a few ordinary rules are observed. If the furnace be so constructed that gas enters into the hot-air chamber, the air coming through the registers will be, to a greater or less extent, injurious. If the furnace radiator is heated to such a high temperature as to burn the dust particles in the air there will be an offensive odor. The question of moisture must also be considered; but that is a matter that also needs consideration in the case of heating by other methods. We think our correspondent, therefore, need pay little attention to this broad condemnation of hot-air furnace heating. The system has its defects, undoubtedly, but so has every other system of heating.

Barker's Chimney Top.

From D. O. N., *Chicago, Ill.*—In answer to the query where Barker's chimney top can be obtained, would say that it is manufactured by Barker Brothers, Braidwood, Ill.

Gasoline Burner Wanted.

From L. & J. A. Steward, *East Clarendon, Vt.*—We desire the address of a manufacturer of a gasoline burner suitable for heating a soldering pan 4 inches wide and 5 feet long, all to be done from one generator.

Gasoline Burner for Hot-Water Boiler.

From H. S. & D., *Charleston, W. Va.*—In reply to the inquiry of "R. L. S.," in *The Metal Worker* of July 29, we suggest that he put in a gasoline gas machine, and we advise him to correspond with Clarence M. Kemp, Baltimore, Md., who can probably give him some valuable advice in this matter.

In *The Metal Worker* of July 29, page 45, is a letter inquiring about flat seam roofing, from William Surrell. His address, however, should be New Madrid, Mo.

WORLD'S FAIR NOTES

Chapman Valve Mfg. Company

of Boston, whose works are at Indian Orchard (Springfield), Mass., make an exhibit in a conspicuous position on the central aisle of Machinery Hall. They have built an arched entrance composed of two brass pipes for columns which support a curved sign giving the location of the works and branch offices in the leading cities of this country and in London, England. These pipes are fitted with collars at short distances from one another, to which are attached valves, gates and cocks, in brass and nickel, beginning with very large sizes at the bottom and tapering to small ones at the top. At one side of the space are three large iron pipes supporting several tiers of straight-way water and steam valves, illustrating the variety of such devices manufactured by this company. In the rear is a fine walnut showcase containing highly polished brass valves arranged in tiers on two polished walnut pedestals. On one side of this case stands a column composed of gate valves resting on their sides, tapering from a very large one at the bottom to a very small one at the top. A similar column stands on the other side of the case, with the valves fitted with wheels. Fire hydrants are also shown.

One noticeable feature of this display is that the valves shown are taken from regular stock and not highly finished for the occasion, so that the visitor gets a correct idea of the quality of material and workmanship put into their goods by this well-known company. In all the power plants recently erected the tendency has been to increase the pressure of steam carried, so this firm call the attention of engineers to their complete display of valves and flanges especially designed for this class of work, and which have so fully met the severe demands made upon them. Among the special features shown, as applied to the Chapman high-pressure steam valves, with renewable bronze seats, are the outside screw and yoke, the by-pass arrangement, the ribbing of the body that it may not be affected by the expansion of the pipe line, and the self-packing feature on the spindle, by means of which the valve may be packed when wide open and the steam on the line. Both tongued and grooved and plain flanges are shown for high steam work, and may be used either bolted to valve or as flange unions. These valves may be seen in actual service as throttle valves in the Allis quadruple expansion engine, in Machinery Hall, as boiler stop valves on the Heine boilers, in the boiler house annex and at the power house of the intramural electric railroad, which has high and low pressure valves throughout, manufactured by the Chapman Valve Mfg. Company. The company make valves from ¼ inch to 48 inches in size, but only exhibit as high as 24 inches, as they are limited in space in Machinery Hall. In addition to the above mentioned are shown a complete line of brass and iron valves for feed and circulating systems and exhaust and low-pressure steam ; also ammonia valves for mechanical refrigeration and valve and fire hydrants for use on water mains. The display is so arranged that each valve may be easily examined and shows all varieties of end connection, methods of opening, indicating devices, &c., in a most attractive and appropriate manner. Edward L. Ross, M. E., is in charge of the exhibit.

Davies Bros. & Co., Limited,

Crown Works, Wolverhampton, England, make an exhibit of galvanized iron in the British section of Machinery Hall, under charge of J. Bayliss, their American representative. A number of specimens of plain and corrugated sheets are shown ; also pipes, elbows, crestings, &c. The Davies automatic galvanizing machine, owned and used by this firm, has just been introduced into the Whitaker Iron Company's works at Wheeling, where it has proved so satisfactory that the company propose to put in a second plant at their earliest possible convenience. The Cambridge Iron & Steel Company of Cambridge, Ohio, have also put in a Davies automatic machine, which is just getting to work in connection with a Wais & Roos leveling machine, made by the Wais & Roos Punch and Shear Company of Cincinnati. Mr. Bayliss is also negotiating with other galvanized iron manufacturers who are favorably impressed with the machine and expect to introduce it shortly.

The Niagara Stamping & Tool Company

of Buffalo, N. Y. (Section 28, Column L-46), make a very extensive display of tools and machinery for stamping, forming and cutting sheet metals. The exhibit includes almost the entire line of manufactures embraced in their revised catalogue of the current year, and is, therefore, a very complete exponent of the product of the establishment. The goods are all selected from the regular stock, and thus fairly represent their ordinary commercial quality. Amongthe larger machines may be mentioned several sizes and styles of punching presses, drawing presses, drop presses, squaring shears, bar and rod shears, and rotary, slitting and circular shears. Smaller sizes of the same class of machines are arranged for foot and hand power. All kinds of hand tools and small machines used for the various processes of manufacture of tinware and sheet-metal goods of every description are here represented and present a somewhat bewildering array, for their name is legion.

Iron Clad Mfg. Company

of New York make an exhibit of a unique character, entirely original for this occasion. They have a large square space, inclosed by a heavy nickel-plated railing. Above this is a frame work, with columns made of Milk Cans for bases, supporting ironclad, cold-weld Boilers, on top of which are small Milk Cans, surmounted by still smaller city delivery cans. These columns are connected by cross pieces, on which are hung small wares, such as Tea and Coffee Pots, Drinking Cups, Dippers, Spoons and Kitchen Utensils generally. Pipes also run from the columns to a central vertical pipe, 28 feet high, and are used to support cross bars, from all of which hang numerous specimens of the company's kitchen utensils, enameled in various colors. From the top of the central pipe hang wires, to which are fastened metal letters forming the name of the company. There are three entrances, over each of which springs an ornamental archway, with the word "Ironclad" in white enameled letters in the center. The Milk Cans supporting the columns are of different patterns, illustrating the styles in use in several cities. The Boilers are of a new and exclusive pattern, recently put on the market by the company. They are not riveted, but are welded cold, even the heads being put on without rivets. These are tested to 500 pounds, and are guaranteed to stand any water pressure in America. Inside the inclosed space are a number of tables, on which are a great variety of specimens of the company's enameled goods, while on the floor stand many patterns of Milk Cans. The whole of one side of the inclosure is covered with large plate glass mirrors, in a fine cherry frame, with the company's name overhead in white enameled letters. This exhibit is of such a distinctive character that it attracts unusual attention. It is located in the Manufactures Building.

Prize Competitions.

THE COMMITTEE to whom the contributions in Prize Competition No. 21 were referred have awarded the prizes as follows:

First prize to H. L. Chaffee.
Second prize to John C. Perry.
Third prize to W. N. Stevens.

Ventilation of the Mersey Tunnel, Liverpool.

An English correspondent of the New York *Sun* thus describes the method of securing ventilation in the railway tunnel under the Mersey : In the important matter of ventilation, the method resorted to in the tunnel beneath the Mersey at Liverpool is claimed to present one of the most striking achievements. Extending as does this tunnel deep below the bed of the Mersey to the solid red sandstone, and approached at either end by elevators of 70 and 90 feet lift, it was foreseen that ventilation was a necessity of the gravest character. The tunnel is large enough to avoid the piston action, its cross section being several times that of the trains, and at and near the middle of the tunnel are openings to a smaller side drift or tunnel running alongside of the main tunnel to the shore end, where is fixed a large fan, the result being that air constantly enters at the stations, which are thus swept clear of all foul air. A train starting in pure air at the station follows the air traveling in the tunnel up to the center, and any change of air between train and tunnel is thus less than it would be if the air in the tunnel were not moving. Past the tunnel center the train begins to travel against the moving air, by which time the air in the train will be more or less fouled by the passengers, and the ventilation due to train motion then begins to increase. The first air entering from the tunnel to the train is, perhaps, as good at that time as the air in the train, and, as the train proceeds, it meets purer air at every foot forward, and when it reaches the station is in air of surface quality again.

Most of us live and work and sleep, says an English exchange, in stuffy, fusty, badly ventilated rooms, which is one of the chief causes of all the illness that exists and of all the deaths that take place. Especially in the houses of the artisan class, the space allowed for each person is often less than a quarter of what is needed for health ; and it is important to remember that, whatever the size of the room, there should be an opening for fresh air to get in and another for foul air to get out, both of which should be as large as a brick (24 square inches) for every person in the room.

PLUMBING and GAS FITTING.

Master Plumbers of Newark, N. J.

In response to the call sent by the Committee of Five to the plumbers of Newark, N. J., and vicinity, 50 attended the meeting held at 86 William street on July 27, which was in every way satisfactory. A permanent organization was formed and the following officers elected: Elias Berla, president; C. E. Bond, vice-president; Jos. A. Smith, treasurer; Alexander Don, secretary; W. E. Mitchell, financial secretary, and an Executive Committee of five, as follows: Wm. Demars, Theodore Geiser, G. M. Crowley, C. Sullivan and J. Maguire, with the officers working with them as members of the committee. A committee was appointed to frame suitable by-laws, and after some explanatory remarks by different members the meeting adjourned for one week. A feature of the meeting was the enrollment of every plumber in attendance as a member.

Employer and Employed.

A member of the trade residing in one of the prominent cities of the "Nutmeg" State discusses the subject of employer and workmen in a manner likely to interest many of our readers. Among other things he says:

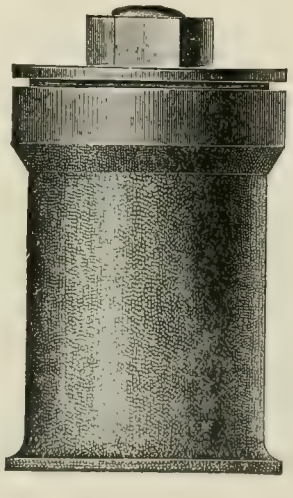
All men are created free and equal as to their rights to enjoy life, liberty and the pursuit of happiness. One may have money and no practical knowledge, while another may possess the knowledge and have no money. In the case of one who has money and no skill, it is necessary for him to employ a skilled workman to act as foreman, or head man, and see that the work is properly done. Here is where a great mistake often occurs. The foreman is a sort of go-between, with the boss on one side and the workmen on the other. Now, in order to have a good effect, a bond of sympathy should exist between the boss, the foreman and the men. Their welfare should be studied. A boss who is friendly to his men and gives them a kind word will generally find his men interested in his work, and that a kind word is better than a curse.

Permit me to say a word in regard to labor unions. A great ghost has risen and will not be downed. A union conducted as it should be will give the employer good men, as none but workmen should be admitted, and a union card should be a good credential for a job. A man working for another should be interested in the work as much as if he were a partner, for in one sense he is. If the boss has plenty of work he is busy and his influence with the customer will secure him work when others will not secure it. He should never be a time killer, or an eye servant, as he little knows who is watching him in these days of stock corporations. I would say work with might and main and there will always be work, for if you are known as a good and steady workman you can always secure employment.

The boss need never be too friendly with his men, but with a dignified and courteous kindness he can command the respect of all. In case of sickness or trouble a visit from the employer will be more appreciated than that of any other friend. A kind word goes a long way in the time of trouble. Too many men are watching the clock, wishing for quitting time, while others care nothing about wasting materials, stock and tools, and this waste will, in the end, make a large hole in the profits. Order is the first law of Nature. A shop should be kept clean and should be run with the motto, "A place for everything and everything in its place." In this connection it may be suggestive to remark, watch the dumping grounds in cities and see the number of people who live by the waste of others. In closing I would say to the boss, be kind and have a good word for all. The foreman should command the confidence of the boss and the respect of the men, and do all he can to improve the boys who are learning the trade. To the men I would say, be faithful and on time in the morning. Obey all orders from those above you, save stock and tools, and never for once think that the boss cannot get along without you.

Garvie's Clean-Out Ferrule.

Peck Bros. & Co., New Haven, Conn., and 47 Cliff street, New York, are manufacturing a clean-out ferrule, as here illustrated in Figs. 1 and 2, which is designed to be thoroughly proof against sewer gases. It is substantially made of cast brass, with a flange at the bottom. It is intended for use in soil pipes, and can be supplied in 2 and 4 inch sizes. Fig. 1 shows the fixture complete with cap partially screwed



Garvie's Clean-Out Ferrule.—Fig. 1.—General View of Ferrule.

down. Fig. 2 is a sectional view showing the method of construction. A brass cap or plug fits into a ground seat in the body of the ferrule, while the screw cap forces the two into close contact, thereby forming an air-tight seal against sewer gases. Once properly placed in position by a plumber the cap can be removed at will by any one and as easily replaced. This ferrule can also be furnished with a projecting flange on top to cover holes in finished floors or in places where the

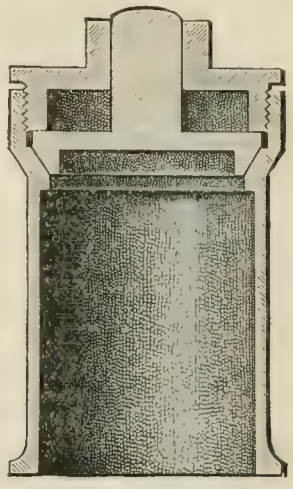


Fig. 2.—Sectional View of Clean-Out Ferrule.

top of the clean-out will be exposed. In such cases a nickel-plated top is sent if desired.

Plumbing Regulations in Yonkers.

The march of improvement in sanitation in New York State seems to have fairly set in, and defective plumbing work will soon be numbered among the "lost arts," under the influence of last year's legislation.

The city of Yonkers, which claimed to have had a good plumbing code, has been amending same under the authority of Chapter 602, Laws of 1892; and what has been of a more or less uncertain character has been definitely settled to the satisfaction of the health authorities and the plumbers. The Examining and Supervising Board of Plumbers and Plumbing, formed under the act aforesaid, and which is thus designated in cities other than New York, Brooklyn and Albany, is composed as follows:

Dr. Valentine Brown, health officer, chairman,
Robert Harper, master plumber, appointed for three years,
J. A. Lamont, journeyman plumber, appointed for two years,
R. Lenahan, master plumber, appointed for one year,
Samuel L. Cooper, Commissioner of Public Works,
M. Hanrahan, secretary,

in conjunction with the Board of Health, which consists of the Mayor, Supervisor, President of the Common Council, President of the Water Commission and President of the Board of Police and the Health Officers. The following regulations are now in force:

Plumbing and drainage plans and specifications relating to new buildings in Yonkers must be filed with the Board of Health and approved in writing by the Board or the Health Officer before being executed. The necessary blanks are to be had for same on appli-

cation. Materials and workmanship to be of good quality and character. Separate and independent connection of each house with main sewer required. The choice of glazed earthware with cement joints or iron pipe and lead joints resting with the owner or architect. The house drain, of cast iron, must have a fall of ½-inch to the foot unless otherwise permitted by the Board of Health. If the pipe cannot be carried along the cellar wall or ceiling it is to be laid in a trench cut at a uniform grade, walled up on the sides and provided with movable covers with a concrete base of 4 inches in thickness on which the pipe is to rest. The front wall trap is called for, the fresh air inlet to be at least half the diameter of the soil pipe and opening to the outer air at any convenient place away from window. Chimney flues are forbidden to be used for ventilating sewers, and brick, sheet metal or earthenware flues for the same purposes are not allowed. All changes in direction of lines to be made with ¼-branches and one-eighth bends. Soil pipe to be extended 2 feet above the highest part of roof full bore. Horizontal soil and waste pipes are prohibited, and no traps are allowed at base of vertical soil or waste pipe. All soil, waste, house, drain and vertical lines of vent pipe must be of iron, of the grade known as extra heavy untarred pipe. All of the cast-iron pipes, before the fixtures are set, are to be tested by water, the pipes so filled to be allowed to stand for 24 hours before inspection. Lead calked joints in iron pipe or joints made with iron filings and sal-ammoniac are required. The connection of lead and iron pipe to be made with ferrules and wiped lead joints. The trapping of all fixtures is called for and a vertical line of vent pipe (lead, copper or cast iron) not less than 1½ inches in diameter to be provided, the said pipe to be extended 2 feet above the highest point of roof or branched into soil pipe above the highest fixture. Safes under fixtures to be drained in the usual manner by special pipes not connected with the soil or waste pipe system, the discharge to be either into an open sink upon the cellar floor or outside the house. Cisterns for drinking water are forbidden to be lined with lead, galvanized iron or zinc. If lined, the lining must be tinned or planished copper. The overflow to be trapped and discharged same as the safe wastes.

Rain-water leaders must never be used as soil, vent or waste pipes if connected with a cistern; nor shall any soil, waste or vent pipe be used as a leader. Outside leaders, when connected with house drains, are required to be trapped beneath the ground with a deep seal. If inside the house they are to be of cast iron with lead joints. Steam exhaust pipes not allowed to connect with soil or waste pipes. Cellar and foundation walls to be rendered impervious to dampness. Sub-soil drains to be provided when necessary and no connections to be made with any sewer except by a slant or branch. The plumbing work in all cases to be left open for inspection and the health officer notified.

The penalty for each and every violation of these regulations is a payment of a fine of $100.

TRAPS AND VENTS.

"Smith & Anthony Company, Sanitary Plumbing Specialties," in attractive lettering in two shades of blue on the show windows at 56 Beekman street, find the recently consolidated interests of this Boston house in the charge of C. E. Stevens, in an excellent showroom located right in the midst of the trade in New York. The Sanitas plumbing goods are now being set up to be shown in operation and will be the feature of the showroom well worth seeing when completed. They will also sell the Whirlpool closet of the Beekman salutary system. The Hub steam and hot-water boilers and the Hub hot-air furnaces will be shown by samples. A full line of the Sanitas specialties will be open for the inspection of the dealer. These goods are displayed in the Manufactures Building at the World's Fair.

The *Plumber and Decorator* of London reports that the efforts made to improve the plumbing instruction in the city and guilds of London Institute have been very effective. There has been an increase of candidates in this branch of education, the numbers for the last four years being 547, 569, 684 and 825, respectively. With this increase a diminution has been noted during the last three years in the percentage of failures to pass, the figures being 59 per cent. in 1890, 56.7 in 1891 and 47.2 in 1892. Nearly 1500 candidates are entered for the theoretical and practical plumbing examinations in connection with the institute and the Worshipful Company of Plumbers of London.

Yeoman service is rendered the new plumbers' association in Newark, N. J., by Secretary Alexander Don, though he is hobbling about with a cane, having recently received in an accident a severe bruise on the tendons of his heel.

Sealed proposals will be received at the office of the Supervising Architect, Washington, D. C., for the labor and materials required to put in place all the plumbing and gas pipe in the United States Court House and Post Office Building at Troy, N. Y. Drawings and specifications may be obtained at the office of the Supervising Architect at Washington, or at the office of the Superintendent at Troy.

The following method of bronzing metal articles which are not too heavy for easy handling is recommended by the *Plumber and Decorator:* Thoroughly clean the surface by means of lye and repeated rinsings of cold water, or sandpaper the surface thoroughly clean. If water is used, dry well with a chamois and then heat the article so as to wholly dispel moisture. Now give the surface a coat of shellac, much diluted with alcohol, or a coat of lye. When this is nearly dry proceed in the ordinary manner to apply the bronze, which will adhere to the sticky surface. This plan gives much better results than when the bronze is mixed, because it will not turn black for some time, the reason being that the copper of which the bronze is composed does not come into contact with the metal.

An ingenious automatic switch is now applied to the electric lamps in the guests' room in a hotel, whereby the locking of the room door from the outside (but not from the inside) turns off the lights. Many travelers, it seems, says an exchange, doubtless with the philanthropic idea of helping the business of the local electric lighting company, are accustomed to leave the lamps burning at full head when they vacate their rooms.

Some English gas companies are adopting the use of a new automatic gas meter by which gas is sold to consumers by a penny in-the-slot plan. Some 5000 of these meters are now fixed in Liverpool, and are said to be very popular. They are gratuitously supplied to any house, and by dropping a penny in the slot 25 feet of gas can be obtained, or sufficient to supply one burner with a good light for five hours. The system is to be introduced into Ipswich and other towns, and it is believed that it will have the effect of inducing small householders to adopt gas for lighting and heating purposes in preference to any other medium.

China's Imports.

Very little definite information exists in this country relative to the magnitude of business in iron and steel with China. Some interest, therefore, attaches to a report by Consul J. A. Leonard of Shanghai on the imports into China during the years 1891 and 1892. We have compiled from it the following table:

Imports into China (Net) in 1891 *and* 1892.

Metals.	1891. Gross tons.	1892 Gross tons.
Iron:		
Nail rods	27,000	17,879
Bar	11,824	7,965
Hoop	1,099	727
Sheets and plates	4,094	2,637
Wire	3,768	4,003
Pig and kentledge	3,820	5,779
Old	51,130	41,914
Tin:		
Slabs	4,010	3,986
Plates	1,235	1,149
Lead:		
Pigs	9,200	13,177
Tea and sheet	314	131
Copper:		
Bar, rod, sheets, plates, nails	458	546
Wire	75	84
Unmanufactured slabs, ore	2,277	1,812
Copper ware, unclassed	35	30
Yellow metal, bar, rod, sheets and nails	1,835	1,567
Brass wire	183	188
Steel	3,405	3,181
Spelter	806	2,652
Quicksilver	128	154
Metals, unclassed	297,918	294,451

The total value of the metals imported is placed at $7,254,448 in 1891, and at $7,130,866 in 1892.

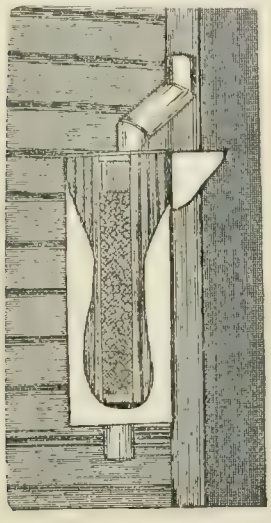
Charles C. Lockstaedt, a mechanical and electrical engineer recently residing in Chicago, is missing, with charges of forgery and obtaining money under false pretenses against him. He is said to have raised above $100,000 by forging notes of the Westinghouse Electric Company, which were negotiated at different Chicago banks. He was the originator of the Chicago Pulley and Hanger Company, and is said to have stocked the shop with machinery unpaid for but used merely as a cloak to give him business standing in the negotiation of the forged notes. It will be recalled that Lockstaedt was the lowest bidder for electric lighting at the World's Fair, through whose instrumentality the Edison Company were defeated in endeavoring to get a much higher price.

Thomas A. Edison thinks the practical speed limit on the horizon of electrical locomotion will be about 150 miles an hour. Before moving heavy trains by electricity he believes that we shall shoot our mail through the country by some electrical device—of telpherage construction, in all probability.

ROOFING AND CORNICE.

The Fox Anti-Freezing Filter and Cut-Off.

We show in the accompanying illustration a view of the Fox Anti Freezing Filter and Cut-Off combined, manufactured by S. S. Fox & Co., Marion, Ohio. The filter is constructed of galvanized iron in two sections, as shown in the illustration, the inner one being corrugated, which, it is said, will not freeze and burst. It is filled with charcoal



Broken View of the Fox Anti-Freezing Filter and Cut-Off.

and gravel, which both filters and purifies the water, making it, it is said, as clear as any well water, and perfectly wholesome for drinking purposes. The cleaning of the filter is an easy matter; the cut-off simply being lifted and swung around into the waste pipe, then the lid is removed and the filter lifted. The charcoal and gravel can then be readily cleaned and put back, or else replaced with new if desired. The cut-off at the top is referred to as being very convenient for washing the soot or dust from the roof before the water is turned into the cistern. The cisterns are made in two sizes—namely, 2 and 4 inches.

The Penn Iron Roofing and Corrugating Company, Ltd.,

of Philadelphia have just received from the press a very large and handsome catalogue of their reeded steel sectional ceiling and side wall decorations, made under the Sagendorph patents. The catalogue is complete in 110 pages, each 10 x 13½ inches, and contains upward of 325 illustrations, many of which attain a size of 8½ x 11 inches. The covers are of stiff paper, the front being handsomely printed in colors and illustrative of the use of decorative art metal plates. The inner page of the front cover announces that the company are not imitators of wall paper designs, all their metal designs being reproductions of ancient carved or molded art and modern art, and include many bold configurations, original in conception, developed by the best artists. The plates illustrated are intended for use in churches, halls, hospitals, dwellings of all classes, and buildings of all kinds. The catalogue is arranged in departments. The first department includes double-reeded steel sheets, and covers molding strips in sizes 1⅓ inches to 4⅓ inches in face and ½ inch to 1¼ inches in depth, suitable for side walls or ceilings; designs of plates, moldings and ornaments, cornices, girder coverings, ceilings, cornices in sections, plates suitable for stileing, paneling or wainscoting, large center ornaments for ceilings, borders, sections of finished ceilings, store ceilings, lavatory interiors, porch and church ceilings and interiors, office and billiard room interiors and a house exterior. The descriptions are very plain and concise. The second department contains some handsome designs of centers and ventilating centers for churches, halls, or large rooms. In the third department are shown wainscoting and side walls in imitation of brick and tile. The fourth department illustrates Italian Renaissance decorations in stairways, wainscoting and dadoes, combination art plates, vestibule interiors and art ceilings. The fifth department shows coves, borders and friezes. The sixth department takes in art steel plates, for ceilings or side walls, in groups, and exhibits many unique designs applicable to all situations. Many combinations of the plates and parlor and store ceiling designs are also shown. The seventh department is devoted to deep molding panels, friezes and complete designs for ceilings with instructions for preparing foundations for ceiling plates and giving explanatory detail drawings. The eighth department includes deep molding plates, stileing sheets and many rich and beautiful combinations. The ninth and last department illustrates the company's extra deep molding plates, which are rich and massive in design, and are 2½ inches in depth of molding, therefore adapted for particularly high ceilings. This department also presents a number of handsome designs for ceilings, side walls and stairways. The remainder of the catalogue is devoted to some plain directions for ordering, preparing, putting up and finishing steel ceilings, and rules governing the mode of application of plates for the best effect. The catalogue should prove very acceptable to the trade.

Sheet-Metal Ornament.

The Metal Stamping & Spinning Company, Grand Rapids, Mich., make an extensive line of sheet-metal ornaments and other specialties, a particular feature claimed for the goods of this company being that their designs are all original. We show in the accompanying illustration an example of the sheet-metal ornament turned out by this firm. In addition to the regular line that they have in stock they state that any special design in ornamental work can be done on short notice by sending them a sketch or drawing or sample of the design wanted.

Sheet-Metal Ornament.

FLASHINGS.

Marlin & Co., Allegheny City, Pa., are just adding another building, 25 x 50 feet and two stories high, to their sheet-metal working plant. Metallic skylights, galvanized-iron cornice, Standard expanding water conductor and fasteners and eave troughs in 8 foot lengths, with detachable couplings, find a liberal patronage in the trade. Another field in which they have a grow-

ing demand is the sheet-iron work for heating and ventilating where either pressure or exhaust fans are used and for blowers. A fine piece of work recently turned out was a T branch made of heavy galvanized iron, the main being 43 inches in diameter and each of the branches 34 inches in diameter. It was so made as to appear like two circular elbows growing out of one pipe, the joints being smooth and the curves being uniform. Some of the plants and buildings for which they have done the ventilating sheet-iron work are the Pittsburgh Locomotive Works, the Bindley Hardware Company's building, the Newell Hotel, the Fuel Gas & Mfg. Company's plant, the rolling mill of Shoenburger & Co., the rolling mill machinery plant of Robinson & Rea and the Braddocks wire works of J. Painter & Sons Company.

AN ATTRACTIVE CATALOGUE is issued by the KNOX & STONIER Architectural Sheet Metal Ornament Company, Toulon, Stark County, Ill. The catalogue is 9½ x 12 inches in size, bound in fancy paper, prettily colored. The interior pages (some 50 in number) contain an extensive series of illustrations of sheet metal work of their manufacture. Some 12 pages are given up to enrichments, friezes, &c., of various kinds; crestings follow, then diapers, &c.; then come panels and panel ornaments, shelves, leaves, finials and urns, &c., the catalogue closing with a few examples of sheet metal statuary. In connection with the illustrations are given the numbers of the articles, sizes and prices.

THE J. S. BROOKS MFG. COMPANY, Brooklyn, N. Y., who are putting on tin roofs on a system patented by J. S. Brooks, and illustrated in *The Metal Worker* a few months ago, state in a letter that they find the work greatly facilitated by the use of the quadruple roofing folder made by M. E. Hastings of New York Mills, N. Y.

W. G. HYNDMAN & Co., Cincinnati, Ohio, take pride in having designed and had constructed under their supervision all the machinery used by them in the manufacture of iron and steel roofing and siding, whether flat or corrugated. Being among the oldest manufacturers in this line of business, the industry has ever found them progressing with its growth.

POWER AND HAND MACHINERY for the tinner's use in working sheet metal is made by J. M. Robinson & Co., Cincinnati, Ohio, and when their line of cornice brakes, flanging machines, presses and rolls do not meet the requirements, special machinery to accomplish the desired result is designed and constructed. In addition to making machines they stamp up special designs from sheet metal for houses who require goods of that character.

WRITING from Murree, India, F. C. Constable relates that during a recent hailstorm corrugated iron roofs were in many cases perforated by the hail. As an ending to this extraordinary tale he says he measured one hailstone four hours after the storm and found it to be 4½ inches in circumference.

A NEW CATALOGUE from Bowers, Galpin & Co., Binghamton, N. Y., appears in a light olive cover printed in dark blue, apprising the trade that their facilities have again been increased and several new articles are presented that are of the class that sell on their merit. In shape, the pamphlet is well adapted for illustrating galvanized iron. IX and IC terne plate and patent "Never Slip" eave trough, which is sold in seamless 10-foot sections, galvanized and terne plate gutters in long sections and various styles occupy several pages. Galvanized iron ridging and corrugated octagon and square conductor pipe are shown in long sections and elbows and fittings in variety. Standing seam steel roofing is also shown by illustration. Specially prepared circulars giving full instruction and information of any of their specialties are furnished on application.

AT THE INVITATION OF BRUCE & COOK, a number of roofers in the vicinity of New York attended the exhibition of the quadruple roofing folder by the patentee, M. E Hastings of New York Mills, N. Y. Being a practical roofer, he showed that considerable time could be saved both in the shop and on the roof by the use of his machine.

GEO. DANBY of the American Sheet Iron Company, Phillipsburg, N. J., was in New York this week and reports that the month of July has been used to thoroughly overhaul their engine, but next Monday the mill will start running full, making three turns a day.

DURING the first half of this year sheet iron for roofing purposes, guaranteed not to exceed $\frac{6}{10}\frac{4}{0}$ pound per superficial foot was sold f.o.b. Ohio mills at $2.65 per hundred pounds, terms, 60 days' note or acceptance, or 2 per cent. discount for cash in ten days. This price was made by a mill possessing a good reputation and was considered "suicidal" among the trade. To-day any roofing concern having cash at their disposal would not have to hunt many days to find a mill ready to accept specifications at a very much lower figure.

T. S. CASEY and GEORGE E. DAY have united forces under the firm name of Casey & Day and will hereafter represent, as selling agents, the Riverside Iron Works of Wheeling, manufacturers of Steel Pipe; the Globe Roofing Company of Cincinnati, makers of Sheet-Metal Roofing, and the Newport Rolling Mill Company of Cincinnati, manufacturers of light Sheets. Mr. Casey has represented the Riverside Iron Works in Chicago for 17 years, while Mr. Day was manager of the Hazen Company of Cincinnati for 12 years, so that both are very widely known in the Western Iron and Hardware trades. Their offices will be located in suite 445 The Rookery, Chicago.

A writer in a London magazine records the results of calculation made by him of the weight and measurement of the sea. According to his computations the number of gallons in the whole sea is 373 trillions (million million million), which, if it could be poured away at the rate of 1000 gallons a second, would take nearly 12,000 million years to get rid of. Supposing the sea to be formed into a round column reaching to the sun, the diameter of the column would be nearly 2½ miles. The Pacific would form 53 million miles of its total length of 93 million, and the Atlantic 18 million.

Plaster-of-paris has lately come into vogue in France for flooring, in place of wood or tile. The French, who have carried the art of hardening plaster to perfection, use, says the *National Builder*, six parts of good quality plaster intimately mixed with one part of freshly slacked white lime, finely sifted. This mixture is then laid down as quickly as possible, care being taken that the trowel is not used on it for too long a time. The floor is then allowed to become very dry, and is afterward thoroughly saturated with sulphate of iron or zinc, the iron giving the strongest surface, the resistance to breaking being 20 times the strength of ordinary plaster. With sulphate of zinc the floor remains white, but when iron is used it becomes the color of rusted iron; but if linseed oil, boiled with litharge, be applied to the surface, it becomes of a beautiful mahogany color. Especially is this the case if a coat of copal varnish be added.

The quickness with which our American hustlers can work when caught in the horns of a dilemma was well illustrated at Muncie, Ind., a few days ago, observes a Western exchange. The material for building 1 mile of electric railway arrived in that city, after having been "lost" on the railroad for 12 days, at 4 o'clock Monday morning. The rails and other materials were unloaded and hauled from the cars, over a mile, where the work of road making began. This was kept up until 12 o'clock the next day, when, after just 32 hours' work, 4800 feet of track had been laid, the track lined up, surfaced, dirt thrown back in, the poles erected, the trolley wires strung, the feeders tapped in and a car started over the track. More than 8000 persons were carried to the baseball game over the road that afternoon.

Yet another cement for pipes is chronicled. The *Safety Valve* recommends it as specially valuable for filling up leaks, such as a blow-hole in a casting, without the necessity of removing the injured portion. The cement in question is composed of 5 pounds Paris white, 5 pounds yellow ochre, 10 pounds litharge, 5 pounds red lead and 4 pounds black oxide manganese, these various materials being mixed with great thoroughness, a small quantity of asbestos and boiled oil being afterward added. The composition as thus prepared will, it is said, set hard in from two to five hours, and possesses the advantage of not being subject to expansion and contraction to such an extent as to cause leakage afterward, and its efficiency in places difficult of access is mentioned as being of special importance.

The mica industry of South Australia has received a fresh impetus recently. Several parties have started from Adelaide to the McDonnell Ranges, where large deposits of the mineral are found, to re-open some of the old workings. The reasons before which caused their temporary abandonment were the difficulty of transportation and the fall in the price of mica. It is now thought that these have been obviated. The mica has to be carried 500 miles on camels to the nearest railway station, Oodnatta, the present terminal point of the overland railway now in course of construction by the Government. Thence it is transported by rail to Port Augusta and shipped to the most profitable markets. The demand is said to be very good at present.

An International Petroleum Exhibition, dealing with oil, oil illuminants, oil heating and cooking apparatus, oil motors and apparatus and appliances, is to be held at Bolsward, in Holland, at the beginning of this month.

STOVE TRADE NOTES.

The Future of the Hot-Air Furnace.

By A. W. Glessner,

President of the Excelsior Steel Furnace Company.

PROFITS ON FURNACES.

In conversation with a furnace dealer in a growing town in Illinois, a short time since, the gentleman complained bitterly of the low prices at which furnace contracts were being let in his place, and said that he was being "knocked out on all sides"—not only by furnacemen but by steam contractors as well. I thereupon asked him what profit he thought he was entitled to on a furnace job for an eight-room house, and he promptly replied: "Fifty dollars, at least." "Well, then, what do you figure the cost of the furnace and materials on such a job?" He figured a moment and said: "About $125." "And the labor?" "Oh, $25 more." "Then," said I, "on an investment of $150, all told, you consider yourself entitled to a profit of at least $50?" To which he replied that he did. Further discussion of the subject revealed the fact that he was buying his furnaces on time, and not taking the discount, and that the cash outlay, instead of being $150, was less than $100. He was then asked if, in view of the general trend of prices downward and the narrowing margins of most lines of goods handled by him, he was not expecting too large a profit on the furnace department of his business, and after some beating about the bush he admitted that he ought to be satisfied with a smaller sum, but claimed that, as far as his past experience went, a dealer was not justified in handling a furnace job for less than the sum originally named.

Doubtless many other dealers hold the same opinion; but while they hold out for higher prices and larger profits, other and more progressive dealers are coming in and taking jobs at closer yet safe figures, and helping instead of hindering the furnace business.

LARGE PROFITS.

Dealers in all lines have certain articles on which they expect and intend to make large profits, owing to a lack on the part of the buyers as to the intrinsic value of such articles, and dealers fight vigorously every decline in the price of the same, but we are on the downward course in most lines, and it is useless to expect to realize war prices and profits on furnace work. A furnace job should yield a fair margin to the dealer, but it should not be expected to pay double and thrice the percentage of profit that other articles do. Furthermore, a furnace differs from most other articles in the stock of a dealer, inasmuch as it is a constant source of profit, for once the dealer puts in a furnace for a man he has a hold on that man, and if he treats him properly he will have his steady patronage, as the customer must come to him for repairs and cleaning out the apparatus, and will naturally place his total trade with the dealer. This phase of the furnace trade has not been sufficiently considered by the dealer, and if the value of the furnace trade as an adjunct to the general business of the dealer is admitted, he can certainly afford to seek furnace contracts at a fair margin.

EXCESSIVE PROFITS.

One thing is reasonably certain, and that is that excessive profits cannot be realized from furnaces in the future, and on the other hand there is no reason for thinking that prices will go to a point which will fail to yield a satisfactory profit to the dealer who buys carefully and understands the business.

(*To be continued.*)

The Belleville Stove Works.

We have received from the Belleville Pump & Skein Works, proprietors of of the Belleville Stove Works, Belleville, Ill., a copy of an illustrated catalogue of St. Clair stoves and ranges, which they have just issued. It is a work of 116 pages, profusely illustrated with well-executed cuts and bound in flexible covers carrying a side title in old gold, silver and green upon a maroon groundwork. Following the presentation of prices at which stove repairs can be supplied, a statement of terms, remarks concerning breakages and freight overcharges on stoves, ranges and castings, together with directions for setting up and operating stoves, attention is invited to the Acme wrought-steel range, made with six boiler holes in the top surface, large flues, ventilated oven, swing feed door and elevated warming closet. Following this in turn we find the St. Clair A, which is a new six-hole range of novel decoration and embodying features which render it durable and satisfactory in operation. This stove is shown in several varieties, as is also the Brilliant St. Clair, which is intended for soft or hard coal or wood. The St. Clair B, the Royal St. Clair, the Grand St. Clair, the Model St. Clair and the Magic St. Clair, the latter being a four-hole wood range, are some of the other goods illustrated and described. The cook stoves occupy a number of pages, and are presented under such names as the Perfect St. Clair, a new first class four-hole stove for soft or hard coal or wood and having stove back guaranteed for five years; the St. Clair A, the Home St. Clair, the Advance, the St. Clair, the Famous A, the Superb, which is a new series of cook stoves embodying the latest features; the Family St. Clair, the Belleville, the Challenge, the Reliance, the Matchless and the Lily, the latter being a cheap cook intended for burning wood only. The place of honor among the heating stoves is given to the St. Clair Oak, made with double fire pot and having cone center grate, sheet-steel jacket and nickel trimmings; the St. Clair Oak, fitted with ventiduct, which is made strong and not likely to get out of order; the Cornelia, a base heater with magazine and full return flue; the Peerless, a very pretty open Franklin stove with round fire pot; the Vulcan, a heavy cannon stove; the Merit, a new laundry stove; the Graphic St. Clair, a well-made cottage parlor stove; the Parlor Queen, a handsome Todd for burning wood; the Imperial, an attractive box stove, and the Pet, a unique construction for burning coal or wood. A long list of hollow ware, tin trimmings, elbows, drums, stove pipe, dripping pans, tea kettles and miscellaneous goods complete the catalogue.

The Scranton Stove Works.

One of the neatest catalogues coming from the Scranton Stove Works of Scranton, Pa., which it has been our pleasure to examine is that which they have issued for this season's trade. The frontispiece is a bird's-eye view of the company's new works, of which they have just taken formal possession and which the rapid increase of business rendered necessary. A somewhat lengthy description of these works was given in our issue for last week, from which the reader can gather an idea of their extent and capacity. In the catalogue before us attention is particularly invited to the line of goods made under the name Dockash, of which the 1893 series of six-hole ranges occupy the leading place. This stove is fitted with the company's new hypocaust ventilated oven attachment, and the fire box is at the right hand as one stands facing the oven door. The ornamental features are neat and effective, while the construction is of the latest style. Following this construction we find the Z series of Dockash ranges, embodying essentially the same features as are found in the stove just described. The Z series is made in the usual modifications, several of which are illustrated. There are also shown patterns of the Dockash range for 1890, 1888, 1887 and 1881, all of which are offered in a variety of styles and sizes. We also notice the 1892 pattern of the X series of Dockash ranges, having six boiler holes and made in five sizes. Other goods include the Dockash Good Morning, Dockash the Great, Easter Dockash, Easter, Wyoming and Lackawanna. Under the name Dockash the company offer a four-hole range of attractive design, embodying the latest features; also a six-hole range known as the Dock Corn. The Dockash steel range, the Longfellow, Universal, Oakwood and Recorder cook stoves are some of the other goods to which attention is invited. The heaters are creditably represented by the Grand Dockash, a handsomely treated square parlor stove for burning hard coal. It is made in four sizes and has round Dockash grate and either solid or sectional fire pot, as may be desired. A foul-air ventilator is provided, which takes the air at the base and discharges it in the back flue at the elbow. It is mounted with a new upper section automatic magazine cover, nickel corner brackets and large flues. It is shown in the catalogue with and without the oven attachment. The Grand Garnet, made in three sizes plain and two sizes with oven, is another attractive heater for burning hard coal. We also notice

the Dockash and Camilla cabinet parlor stoves, the Dockash surface burner, the Central Sun round base burner, the Lackawanna cannon stove and the Office King, a heavy globe stove. One page is devoted to a sectional view of a stove showing the hypocaust system as employed in connection with the Dockash goods. Other features of the catalogue include directions for ordering repairs, list of plates which can be supplied for obsolete stoves, an illustrated description of the Dockash grate and an alphabetical index. The printing of the catalogue is in black upon a good quality of paper, the matter being relieved by an ornamental corner piece in red, consisting of a *fac-simile* of the company's trade-mark in connection with their corporate name. The binding is in flexible covers of such a shade as to form a pleasing contrast with the black lettering employed in connection with the side title.

Southard, Robertson & Co.,

with office and warerooms at the corner of Water street and Peck Slip, New York City, and with foundries at Peekskill, N. Y., favor us with a copy of an attractive catalogue which they have issued relating to their lines of stoves and ranges. These goods are made under a variety of names, prominent among which may be mentioned the Phœnix, a six-hole range, embracing the latest improvements. The constructive features include large oven, burnished edges, extra heavy covers and double supported center pieces, Smyth's patent rotary triangular grate, large ash pan, patent oven door opener, Read's patent draft damper and extended fire pot for wood. There is also shown the New Rocket, a new six-hole range embodying the modern features; the Servia, a medium grade six-hole construction made in several styles and sizes; the Columbus, a substantial low priced six-hole range; the New Jockey, a neat five-hole range; the Pansy, the Wren and the Bono. The cook stoves are represented by the Standard for burning coal or wood; the New Opera, a new addition to the company's assortment; the Magnet and the Yale. The heaters include the well-known Madison Square full revertible flue parlor stove, made in three sizes and decorated in a tasteful manner; the Columbus, made direct draft and also full revertible flue; the Regal, a direct draft round base burner; the Exeter, a well made sheet-iron surface burner; the Flag, a neat cylinder stove; the Aurania, a recent addition to the company's line of open Franklin stoves; the Cottage Home, the Ingle, the London, a heavy cannon stove, shown with and without sheet-iron top; the Senate a member of the same class, and the Lotus, a cheap laundry stove. A comprehensive index and a list of stoves for which repairs can be furnished are features of the catalogue. The volume consists of 96 pages and is bound in black covers with side title in silver lettering.

A POSTAL CARD is being sent out by Faith Belson & Co., Philadelphia, bearing the following information: "We take pleasure in informing you that we have removed to our new and spacious building at 229 Market street, where we hope to be favored with a continuance of your patronage." With the increased facilities gained by the change, orders for stoves, gasoline goods and refrigerators will be filled with promptness.

The Maker, Jobber and Seller of Stoves.

From D. T. S.—So many things come up to any one who has had a long experience in every branch of the stove business that a few rambling observations may not be without interest. That the jobber has the best of it I think has been demonstrated by the example found in every trade center. He either buys his stoves complete for so much apiece or has the castings laid down at his door at so much per pound, and can have them mounted by piecework, so that he can say positively that stove cost so much. The foundryman has strikes, breakdowns, unpopular patterns and such items to figure in, so that at best his cost is an estimate, and too late may be found all wrong. The recent disposition to demand more wages by molders regardless of the fact that in no other branch of trade any advance was being made, is something that didn't bother the jobber. Stoves cannot be advanced in price so as to advance molders' wages unless other workmen are getting an advance. Under the present conditions to advance the price of stoves would stagnate trade.

I was talking to a retail dealer only a few days ago and he remarked that two-thirds of his sales of stoves were to people who did not need a new stove because the old one was worn out, but they bought because they happened to see something that pleased their fancy, or an impression had seized them that they had used the old stove long enough, even though it was capable of doing good service for years. He added that to advance the price on stoves would stop their buying and said that the other one-third cannot afford to pay more. One dealer stated that the spring trade was flat; another said he had done less than he had in 12 years, and another that he had had his dullest spring in 25 years.

Fortunately the stocks in the dealers' hands are light, but if the coming winter should prove mild can the same be said next summer? The prospects for a good fall vary with each prophet. If there are not enough goods to go round the maker will be blamed by both the jobber and the dealer, and if there is a surplus on hand at the end of the season the jobber will congratulate himself that it is distributed between the maker and the dealer.

The Excelsior Mfg. Company.

An illustrated stove catalogue, of nearly 200 pages, bound in black covers with silver lettering, reaches us from the Excelsior Mfg. Company of St. Louis, Mo., and with branches in Denver, Col., and Portland, Ore. A noticeable feature of the volume is the printing, which is in two colors, forming a pleasing contrast. Another feature is the back title, consisting of the name and address of the company and the date of the catalogue. By means of it the dealer is enabled to readily identify the volume without trouble, even when filed away with other trade literature. The opening pages of the volume contain an announcement to the trade and the public at large, with reference to the discovery by Mr. Filley regarding the wire-gauze oven door; some remarks pertaining to breakages and freight overcharges on stoves, ranges and castings; a statement of terms; a description of the hot-water center for pressure boilers and other information of general interest in connection with heating and cooking operations. As our readers are well aware the leading products of this company are known under the name Charter Oak, and it is natural, therefore, to find a large number of pages given to these constructions. The first one considered is the Charter Oak four-hole cook, made in six sizes and a variety of styles. The next is Filley's New Brand Charter Oak cook stoves and ranges, which have large ovens, reversible long centers, round edges, outside stationary oven shelves, patent oven-door openers and other modern features. The Royal Charter Oak for wood only; the Charter Oak range adapted for burning the same kind of fuel; the Hotel Charter Oak for wood; the Charter Oak for soft coal; the Grand Charter Oak for hard coal; the Hotel Charter Oak for soft coal, and the Messenger and new Mabel cooks for burning wood only are also presented for the consideration of the trade. In connection with each stove is given the number of sizes in which it is made, the list prices, code words, number of holes in the top surface, the size of the oven and the weight. Filley's Challenge steel ranges for hard coal, soft coal and for wood are also illustrated and described, in connection with which is a table giving the sizes and prices of the different styles made. In the line of heaters we find the Royal Charter hard coal base burner; the Parlor Pride for hard coal; Filley's Charter Oak, a handsome heater made in one size only; the Boaz, a round soft coal base heater, which has become very popular with the trade; the Young Hickory, an oak stove for coal and for wood; the Columbia Oak for burning coal; the Irondale, a cannon stove for coal only; the Wasp; the Pluto, members of the same class; the Opal, a Franklin for hard or soft coal; the Kirkwood, a richly treated cottage, direct draft and revertible flue; the Astoria, a handsome Todd, together with a line of box, laundry and tailor stoves, fire-place grates, charcoal furnaces, waffle irons, boilers, &c. The closing pages of the publication are given up to lists of stove hollow ware, stove trimmings, broiling ovens and sectional cuts of a cook stove and range so numbered with regard to their various parts as to facilitate the ordering of repairs. The volume is arranged in an attractive style and is issued in a form which is likely to find favor with the trade.

ODD PLATES.

IN THE REVIEW of the catalogue of the Peninsular Stove Company, which appeared in our issue for July 22, the new parlor heater known as the World's Leader should have been described as a self-feeding base burner adapted for using hard coal, coke or natural gas. It has heavy ribbed revolving fire pot, which can be removed and replaced through the front mica door, large revertible flues and draw center shaking grate. The ornamentation involves the judicious use of nickel, which, in combination with the black iron of the stove, forms a pleasing contrast. The World's Leader is made in four sizes, with fire pots measuring respectively 10, 11, 12 and 14 inches. The manufacturers refer to the stove as being elegant and attractive in appearance and possessing many new features not found in others of its class.

COMMODORE M. B. MILLS of the Michigan Yacht Squadron, handsomely entertained the employees of the Chi-

cago office of the Detroit Stove Works aboard his steam yacht "Grace," on Saturday of last week. Commodore Mills issued special invitations for the occasion, which was an enjoyable one in every way. The weather was delightful for a cruise on the lake, and those who participated enjoyed a trip which will long be remembered. Among those who were able to accept the hospitality of the Commodore were Mr. and Mrs. Dodson, Mr. and Mrs. Williams, Mr. and Mrs. Schall, John Sheppard, Jr., Miss Sheppard, the Misses Lyman, Miss Deseau and Messrs. Nichols, Ambler, Johnson and Sewall.

WE HAVE RECEIVED with the compliments of Cribben, Sexton & Co., of Chicago, Ill, a memorandum book of a size which permits it to be easily carried in the vest pocket. The covers are of colored paper and carry advertising matter relating to the Universal stoves and ranges which are made by the company named. The third page of the cover gives rates of domestic postage, while the fourth page carries the names of the cities, both domestic and foreign, in which the company have agencies. Across the top of each blank page intended for memoranda is an inscription calling attention to some feature of the Universal stoves and ranges.

THE DEMAND for the goods turned out by the Round Oak Stove Works of Dowagiac, Mich., continues of a gratifying character and orders are received by the company from all sections of the country as well as from foreign parts. Among their recent shipments was a bill of goods to Corea.

WORK WAS RESUMED Monday, July 31, at the works of Fuller & Warren Company, Troy, N. Y., a full force being employed and all departments of the plant are in operation. Treasurer Mackey states that he expects that the stove foundry will now run nearly full capacity during the fall and winter, without interruption. The announcement that the works would start up was received with great joy by the many workingmen employed at the Clinton Foundry. The concern have over 700 men on the pay roll when the plant is in full operation. This, coupled with the fact that the other Troy foundries are doing a good business, is reassuring at least.

IT IS to be regretted that the New York and New England Agricultural Association of Albany, N. Y., is not to hold its fair on the grounds in that city this fall. It will be remembered by the readers of *The Metal Worker* that during the past two years the attractiveness of the exhibitions given by this organization have been greatly enhanced by the showing which the Albany and Troy stovemen made. "Stove Hall" was the most attractive building on the ground — of course coupled with "Andes Hall," the building of the Phillips & Clark Stove Company of Geneva and Troy, N. Y. This year, as the fair people are to hold their exhibit in Rensselaer County, N. Y., it is not in the least probable that the stovemen will take a part, as the conveniences are not at hand, and the location of the fair is not where they would care to go at quite an expense to show their lines of heating goods. If they do make any showing it will probably be through retail dealers.

WE HAVE RECEIVED from the Michigan Stove Company, as a sample of the advertising novelties which they are now distributing, a tin cake cutter which is made in the form of the Garland trade-mark. The cutter forms the shape of the trade-mark in the edges of the cake, while the top lettering impresses on the cake the legend "Garland Stoves and Ranges;" also a very pretty copybook with lithographed copies throughout, two being arranged on a page. The sentences given to be copied consist of references to Garland stoves and ranges, so that it is presumed a very warm feeling toward these goods will be inculcated in the rising generation.

A PLEASANT LETTER from Wood, Bishop & Co., Bangor, Maine, states that their house was established in 1839, and that they can point with pride to numerous churches which they have acceptably warmed in the past 40 years. It very naturally follows that the Monitor wood furnace was used and set with a hot-air grate directly over it, so that the churches were warmed quickly when the mercury was 20° below zero. These furnaces are distributed through Maine and many other States.

THE PENN DIAMOND is one of the new things which the Mt. Penn Stove Works, Reading, Pa., present with pride to the trade. Taken practically, it has the latest improvement of the duplex grate, can be taken apart in the middle for convenient handling, heats a room above or acts as an air circulator, taking the air from the floor, and has a mica illumination so full and brilliant that it might be called electrical. These are specially prominent features among those generally recognized as essential. Artistically, mica, iron, nickel and bronze have been used by the designer to produce a stove with much beauty to attract the buyer. It is put on the market as strictly high grade, and all are invited to make the practical test of running it this fall for a leader to verify the claim. It is made in four sizes, the fire pots measuring full 12, 13, 14 and 16 inches in diameter.

THE SECRETARY OF STATE of Illinois has licensed the incorporation of the McManis Stove Company, with office at Chicago, Ill. The organization is for the purpose of manufacturing heating stoves, as well as heating and lighting appliances, and the capital stock is placed at $200,000. The incorporators are Charles R. McManis, Richard C. McManis and W. I. Culver.

F. E. BROWNE, 314 and 316 South Spring street, Los Angeles, Cal., sends us a circular illustrating and describing Browne's steel dome furnace, so made, it is claimed, as to be especially adapted for the climate of Southern California. It is constructed with a small fire pot with large radiating drum. A deflecting damper is employed to force the products of combustion against the radiating drum instead of allowing them to pass directly to the smoke pipe. It is encased in Russia iron, and the maker states that it can be used on any floor with entire satisfaction. It is intended for using soft coal or wood as a fuel. It is made in three sizes, the smallest being large enough for a six to nine room house, the second size for a ten to twelve room house, while the largest size is said to be of sufficient capacity for heating churches and halls. We also have from Mr. Browne an illustrated circular of the Orient lamp heater, consisting essentially of a drum, in which is placed a mammoth lamp constructed of brass and finished with nickel. The lamp has a capacity of one gallon of oil, and burns with a white flame 5½ inches in diameter. The base or stand holding the lamp is made of cast iron, nickel plated and highly polished. The reflector is also nickel finished. The ornamental top and urn are made of brass and handsomely nickeled. The top and urn may be readily removed, thus permitting the heater to be employed for cooking purposes.

THE FULLER & WARREN COMPANY of Troy, N. Y., are sending out a series of World's Fair cards printed in colors. Upon one side of each card is a picture in which some of the World's Fair buildings are features of the background, while the foreground is occupied with representatives of various nationalities, who appear to be interested in the antics of a personage dressed in the garb of Uncle Sam, standing upon a huge ball or globe, pasted upon one side of which is the inscription "F. & W. Co. Guaranteed Stoves." Upon the opposite side of each card is advertising matter, to the effect that the Fuller & Warren Company are the "largest manufacturers of stoves, ranges, furnaces and hot-water heaters in the world." It is also stated that over 2,000,000 Stewart stoves have been made and sold.

THE ART STOVE COMPANY of Detroit, Mich., have just built an addition to their mounting department, which renders it complete in all respects. New ideas in the way of lighting have been introduced, and the company are fully equipped for the fall trade. Orders are reported greatly in excess of last year. The company have been granted a patent on the flue construction of their oil heaters, and it is used in connection with all styles and sizes. These oil heaters are known as the Laurel and are meeting with a gratifying demand.

THE PENINSULAR STOVE COMPANY of Chicago are distributing to those visiting their display at the World's Fair grounds a card printed in the colors of Spain and America. The card tells where the headquarters of the company are located in Chicago, Detroit and Buffalo and extends to visitors a cordial invitation to call whenever in the cities named. Down in the left-hand corner of the card is a *fac-simile* of the company's trade-mark.

"I WAS CONVERSING with a stove man the other day," says a correspondent, "and, as usual, he became decidedly enthusiastic over his own special make of heating goods, and rhapsodized continually on the wonderful feats performed by a certain range. Then he proceeded to tell how much work the aforesaid range would do with a little fuel. With all the sobriety of a judge on the bench he related how this range was tried by a family who had just purchased one. He said that all they did was to put in the end of an old broom to start the fire; then they used the broom-handle gradually and baked a pan of biscuit or a loaf of bread, I forget which. When I smiled, he offered to take affidavit that such was the case. I expected to hear him begin to tell about how he cooked a corned-beef and cabbage dinner with a piece of brown paper as fuel in this wonderful range, so I changed the subject."

ALTHOUGH it is usually the custom of the large molding shops at Albany, N. Y., to close down during the very warm weather, owing to the season being over and there being a lack of demand for stoves, and also to the difficulty experienced in keeping the temperature of the shops at a bearable point, the firm of Rathbone, Sard &

Co. have concluded to continue operations the year round without abatement. The demand for their stoves has been large and a corresponding demand is anticipated for the future. Of course, most of the work which is now being done is what is termed "stock work," and there will be no return on the investment for some time to come. Their employees are grateful for this decision on the part of the company.

THE FOUNDRY of Oscar G. Thomas, Taunton, Mass., started up a few days ago after a shut down of two weeks for the purpose of making extensive repairs to the plant. A new cupola has been put in, the roofs of the various buildings have been repaired and a general renovation has been in progress. The foundry is running with a good supply of work on hand, and it is intimated that the force is likely to be increased in the near future.

AS MENTIONED last week the Scranton Stove works poured the first heat at their new plant on the afternoon of Tuesday, July 18. The cast was successful in every way, 3½ tons of iron being run into the molds. J. A. Lansing, president, and A. C. Fuller, secretary and treasurer of the company, were present on the occasion named. The works will probably be in full operation in the course of a week or ten days, and all departments will be run full capacity. Each department is under the charge of foremen specially qualified for the position, Thomas Sheppard having charge of the mounting room, W. H. Huber of the foundry, George Frank of the nickel shop, Henry Pillips of the cleaning and milling rooms, James Beattie of the stocks and supplies, Samuel Smith of the engine and machinery, and B. Woodhull of the pattern shops.

THE NEW ENGLAND STOVE COMPANY of Taunton, Mass., are in active operation and a good trade is in progress.

A. E. HAUSER of the Marcy Stove Repair Company, New York, looks better for a month of recreation, a portion of which was agreeably spent at the World's Fair city, where he remarked the fact that notes were withheld and silver invariably given in making change.

THE ABRAM COX STOVE COMPANY of Philadelphia, Pa., are getting things into shape in their new building, which has a frontage of 500 feet on American and 126 feet on Dauphin street, and which has cost in the neighborhood of $80,000. The first floor of the building is intended for shipping purposes; the second and third floors for the mounting department, as well as for storage, while on the fourth floor will be a tin shop and on the fifth floor the pattern shop. The top floor will be used as a warehouse. The salesrooms will be on the second floor, where a space of 35 x 150 feet will be fitted up for the display of goods.

THE SOMERSET STOVE FOUNDRY of Somerset, Mass., resumed operations on Monday, July 31, after a shut down of three weeks for the purpose of making necessary repairs.

A ST. PAUL JOURNAL states that all the cooking in the Minnesota Club House in that city is done by electricity, and fastidious members declare that they never knew before the joys of perfectly broiled chops and steaks. The electrical ovens used are described as wonderfully neat and convenient, and very simple withal. They are made of Russia iron, lined with wood and asbestos, which prevents radiation of heat into the room. The heating plates are so arranged that the heat can be applied either from above or below, or both, at the same time, this and the degree of heat being controlled by a switch placed on the outside. An incandescent lamp lights the oven, and in the front is a glass door through which observations may be taken of the progress of events inside. The thermometer is attached to the top of the oven, showing the exact degree of heat.

GAS STOVES are becoming more common in France. The Paris Gas Company in their report for 1892 show 139,338 stoves lent by them to customers, an increase of nearly 15,000 over the previous year.

THE LATEST SOUVENIRS issued by the Richmond Stove Company, Norwich, Conn., have a much greater value than the ordinary run of advertising matter. They are leather pocket books, of the card-case variety, bearing no reference to the publishers, except the neatly printed name of the Richmond Stove Company in small letters on the inside. The card case is 4½ x 3 inches, divided into three compartments, and is finished with much care and neatness throughout. It is an article for use rather than for decoration, and as such, we believe it will serve to keep the name of the Richmond Stove Company in the minds of many.

THE HOWARD FURNACE COMPANY of Syracuse, N. Y., have issued an exceedingly attractive catalogue in which is given a description, together with other information, relating to warm-air furnaces and combination heaters, which are manufactured under the patents of Charles D. Howard. The make-up of the little volume is of a high order, the arrangement and mechanical execution being above the average. A short chapter is given on the subjects of heating and ventilation, following which are full descriptions of the leading goods made by the company named. The heaters are illustrated by means of sectional views, so that a perusal of the matter presented cannot fail to give the reader an idea of the plan of construction employed and the improved and desirable features incorporated. The company have branches in Boston, Mass., New York City, Grand Rapids, Mich., and Toronto, Canada.

THE JEWEL TALLY-HO COACH of the Detroit Stove Works, which makes daily trips between the company's Chicago headquarters and the World's Fair Grounds, has been carrying a large number of passengers, representing nearly every section of the country. Among those who more recently enjoyed a ride may be mentioned the following: Julius Rieth and mother, and Miss Jennie Rieth of Lansing, Iowa; Mr. and Mrs. Geo. Koch and Elmer Koch, Rochester, N. Y.; Maud Eiseman, Sioux City, Iowa; Mrs. L. Goldsmith, A. H. Gauff, R. J. Miller, Mr. and Mrs. F. H. Fogarty, Mr. and Mrs. H C. Brown, Mr. and Mrs. Sam Pashley, Edward Hutchinson, C. J. Gunderson, Miss Ollie Gunderson, Miss Dorothy Detlie, Miss Estelle Runyan, Mrs. L. Cohen, Miss Bessie Cohen, Mrs. Adam Gauff, Mrs. W. T. Goss, Miss Burbank, Mrs. T. W. Burbank, F. J. Magerstadt and friends, Miss Whiting, Mrs. W. J. Manning, Mr. and Mrs. H. C. Clayton and daughter, S. A. Sydam, Mrs. F. C. Storey and two friends, Mr. and Mrs. Aaron Ehrlich, M. Kaufman, all of Chicago; Mr. and Mrs. L. Rosenberg, Lillian Barbour, Nellie Barbour, H. Barbour of South Chicago, Ill.; C. A. Heergaard, Mandan, N. Dak.; Jno. Sheppard, Mrs. Sarah Sheppard of Penn Yan, N. Y.; E. T. Curry, Clinton, Ill.; Mr. and Mrs. W. H. Kirk and son, Mr. and Mrs. Jno. Swain, P. E. Olsen of Minneapolis, Minn.; H. E. Trilling, Mr. and Mrs. F. J. Robertson, Manasha, Wis.; Mrs. Horace M. Jones, Aurora, Neb.; W. G. Bachman, Decatur, Ill.; Mr. Davis of Pinkerton & Evans, Monmoth, Ill.; Mrs. H. W. Peak and party of seven, Maj. F. M. Burrows, Fort Worth, Texas; G. B. Gunderson, H. U. Furber, Mr. and Mrs. McClarey, the Misses McClarey of Detroit; Jos. Rohrheimer, Shamoken, Pa.; Mrs. S. K. Livingstone, Tamaqua, Pa.; Mrs. Hattie Benjamin, Kansas City, Mo.; W. Barnette, New Orleans, La.; A. R. Kenney, Green Springs, Ohio; O. S. Blakeslee and lady, Sparta, Wis.; Mr. and Mrs. Herman Broeker, Lawrence, Kan.; Mrs. Mallory, Ord, Neb.; Mr. and Mrs. F. A. Gordon, Mr. and Mrs. J. W. Morris of Fairbury, Ill.; J. Loewenberg, Centralia, Ill.; W. C. Forterm, Little Rock, Ark.; Mr. and Mrs. J. F. Bustin, San Angelo, Texas; Wm. F. Stubinger and two friends, St. Louis, Mo.; Miss Eva Simons, Miss Grace Simons, Yonkers, N. Y.; Mrs. Fred. Belden, Kaneville, Ill.; Mrs. Louise Van Northwick, John Van Northwick, Batavia, Ill.; Mrs. W. B. Dodson, Geneva, Ill.; Miss Merrill, Sioux Fall, So. Dak.; Mr. and Mrs. L. B. Sandford, Atwater, Ohio; O. L. Frazier, Davis City, Iowa; Mr. J. C. Freeman, son and daughters, Madison, Wis.; Mr. and Mrs. Jas. A. Ward and sons, Muncie, Ind.; Mrs. C. C. DeCamp, Durand, Mich., and Mrs. C. S. Scott, Moscow, Idaho.

THE BRAND STOVE COMPANY of Milwaukee, Wis., have issued an announcement under recent date, to the effect that Julius Goldschmidt, vice-president of the company, and for the past four years U. S. Consul General at Vienna, has returned to Milwaukee, and again taken up the duties of his office. The company also announce that they have largely increased their producing capacity and storage facilities by the erection of a spacious warehouse. They also have attractive offices and sample rooms where they will be pleased to welcome at all times their friends in the trade and show them the well-known Famous stoves, ranges, heaters, &c.

THE THOMAS ROBERTS, STEVENSON COMPANY of Philadelphia, stove manufacturers, have contracted for the erection of a one-story brick foundry, 100 x 47 feet, and a three story brick storage house, 33 x 66 feet, as an addition to their plant at Second and Mifflin streets.

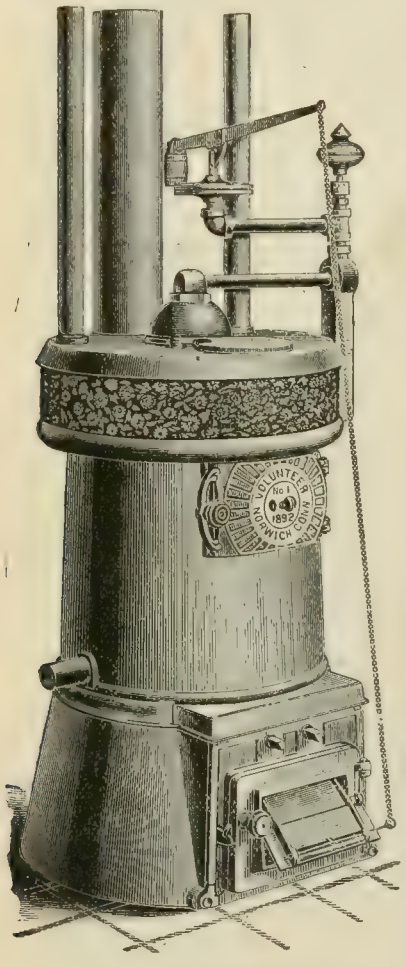
ON AUGUST 1 the firm of Armstrong & Co. of Perryville, Md., was incorporated and made a stock company with a capital of $75,000. The new concern will operate under the name of the Armstrong Stove & Mfg. Company, with William Armstrong president, James Gardner vice-president and F. W. Jones secretary. The directors include the above named officers, together with William H. Cole, Nelson E. Whitaker, J. B. Oldershaw and James W. Strong.

THE NEW PLANT of the Scranton Stove Works of Scranton, Pa., was recently visited by several out-of-town people, among the number being C. E Dunham of Bound Brook, N. J., and F. L. Harrington of Burritt & Co. of Weedsport, N. Y.

STEAM AND HOT WATER.

No. 1 Volunteer Hot-Water Heater.

In the accompanying illustrations we show views of the No. 1 Volunteer Hot-Water Heater lately patented by the



No. 1 Volunteer Hot-Water Heater.—Fig. 1.—General View of Boiler.

William H. Page Boiler Company of Norwich, Conn. Fig. 1 is a general view of the apparatus, showing its peculiar features, it being a very low boiler and neatly decorated at the top. Fig. 2 illustrates separate parts of the heater. The boiler, which is self-regulating and intended for hot-water circulation, is different in form from the other Volunteer hot-water boilers of this firm, the only points in common being the fire pot and ash pit. The boiler has only one section and is designed to set in a back shop, heating that room and also a front or sales room by radiators. It may also be used to heat small cottages of three or four rooms, and is particularly well adapted for heating brooder houses for raising chickens. A convenient feature is a place for heating glue or cooking food for chickens. Referring to Fig. 2, which shows the separate parts of the No. 1 Volunteer heater, on the left is the ash pit and on the right the fire pot, so placed as to show the inside appearance, also the number of nodules or fine points which are cast upon it to prevent the water from chilling the fire. In the center of the cut is shown the under side of the top section. The lower opening through the section is for setting in a kettle, and shows the cover partly swung open. The upper opening is the smoke exit. The center shows the bottom of the regulator tank, the space around it being water space. The next space is for the flue receiving the heat from the fire-pot openings, which passes out directly under the kettle opening and thence around the outer flue to the smoke-pipe exit.

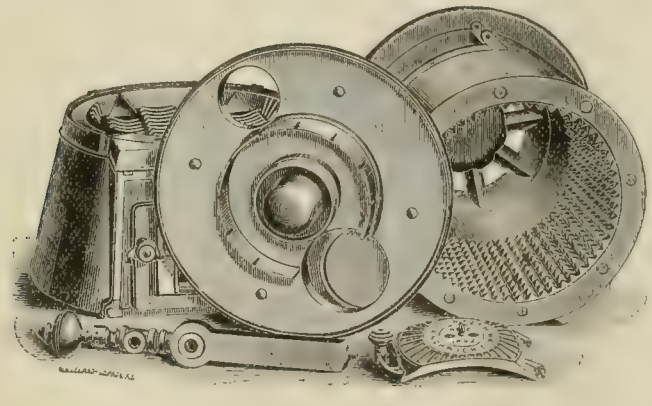


Fig. 2.—View of Separate Parts of Boiler.

A Fine Show of Radiators.

The A. A. Griffing Iron Company, Jersey City, N. J., have made a handsome change at 15 Dey street, their New York office. A fine Brussels carpet covers the floor of the show room, and the walls and ceiling have been freshly frescoed. New offices of attractive finish are arranged at the rear, and electric lights give an illumination only surpassed in brilliancy by Manager Sherman. In the show windows are arranged some of their finest goods. The main sample room is divided from the front by a low railing, at each end of which, at the wall, is a pyramid of electro-bronzed corner radiators at one side and circular radiators at the other, and an umbrella stand made of Bundy sections is on each side of the entrance. In this outer chamber, as attractions, on one side are a stack of Bundy indirect radiators and a new pin indirect radiator; on the other side, in a glass case on the wall, the evolution of the Bundy radiator bronze is shown, from the original bronze bolt beaten in various stages until it is ready to be ground, and glass tubes show the different colors of bronze that can be furnished. Stepping inside the railing the Bundy radiators, arranged with superb effect, are shown in various sizes, colors and styles. When contemplating an exhibit at the World's Fair an investigation showed the company that it was possible to make up 58,000 radiators, no two of which would be exactly alike in every particular. New goods are being prepared, and only those that have made their appearance are mentioned. The Columbia is a new radiator, made for hot water and also for steam, that is of ornate design and susceptible of rich effect in bronze and colors. It is made in all the various hights. The Bundy flue radiator is a stylish new radiator, presenting extended surface and possessing the fashionable flue feature. A new size, 38-inch loop, is added to the Elite line. A duplex damper is a new specialty for use with box base Bundy radiation. Little is left to be desired in elegance by the Bundy Art Tile radiators, which are furnished in a variety of styles, in color and design. The Bundy Renaissance high art radiator presents beauty worthy of any surroundings. A handsome piece of sheet brass work received from a customer enables a Russian bath to be enjoyed by connecting a rubber tube with the air cock on a steam radiator and with the brass chamber, which is perforated to permit the steam to escape in fine jets to moisten the air.

The Lunken Gate Valve.

E. H. Lunken of the Lunkenheimer Company, Cincinnati, Ohio, has invented a new gate valve which is very ingenious and simple, and embraces a number of features. Its compactness is indicated by the fact that a 1-inch valve to carry 150 pounds working pressure weighs ¾ pounds less than the lightest common globe valve. The hub or bonnet is held to the shell by a coppered steel clip or strap surrounding the shell, with its ends passing through the ears of the bonnet and secured by nuts, O, Fig. 1. This clip is held from lateral movement by projections on the shell. The joint is packed by a hard lead washer $\frac{1}{64}$ inch thickness, the top faces of flanges each having a groove to properly secure the washer. The valve can easily be taken apart without renewing the packing washer. The hub or bonnet is flat and narrow and just of sufficient size to receive within it the valve disk when entirely raised, and has sectional or part-nut threads in its opposite interior sides. The threaded portion, J, Fig. 2, of the stem, by engaging with these part threads, causes the valve to be opened or closed. The disk has a straight flat face or bearing against the renewable seat C, Figs. 1 and 2, and is forced tightly against same by the self-adjusting wedging half ring or horseshoe D, Fig. 2, secured loosely in

the valve shell. The wedging on the disk is applied on two wedging surfaces diametrically opposite each other, these coming in contact with the beveled ends of the half ring or horseshoe wedge; thus the wedging pressure is equalized on the entire disk and insures a tight joint on the opposite face. The pressure of the steam or liquid on the back or wedge side of disk also aids to make a tight closing valve.

All valves above 2½-inch size are provided with "by pass," which arrangement balances the disk before opening, and thus reduces the friction and wear on seat and disk and makes the valve open easily. The "by-pass" is shown in Fig. 3. It is an auxiliary valve formed in the top of the valve disk (immediately below the yoke that secures same to the flanged head of the stem H, Figs. 1 and 2) and is operated by the stem of valve, automatically, while opening or closing the main valve C. its threads into the threads in the shell. With the aid of the wrench the cheap seat is very quickly renewed. Another important feature is that the stem, when valve is full open, seats itself, V against U, Fig. 2, thus relieving all pressure on the stuffing box and permitting repacking of same under pressure. The tie band surrounding the shell adds to the strength of the valve and permits of its being taken apart easily with a small wrench. The shell is so short and rigid and the wedging surfaces are so small that expansion and contraction little affect it. Thus the disk will not wedge fast. Having but a single disk and the wedging half ring taking the place of a second disk as a wedging resistance, this construction, it is pointed out, overcomes the objection in double disk gate valves where liquids remain in the shell between the disks and often freeze or injure the valve. Nothing can lodge on the tubes, reaching from the bottom of the lower chamber to the top of the upper chamber, materially increase the heating surface. The outside pipes radiate directly and the inside heat the air rising from the floor. A little pamphlet is likewise issued, giving ten reasons why this radiator is superior to others.

SEALED PROPOSALS will be received at the office of the Supervising Architect, Washington, D. C., until August 30, for all the labor and materials required to put in place, complete, a heating and ventilating apparatus in the United States Post Office Building, Sacramento, Cal., in accordance with the drawings and specification, copies of which may be had at the office of the Supervising Architect at Washington, or from the superintendent at Sacramento.

THE ST. LOUIS MFG. COMPANY, St. Louis, Mo., issue an illustrated and de-

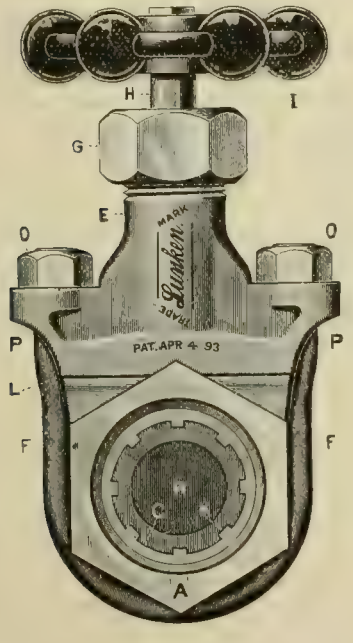


Fig 1.—End Elevation.

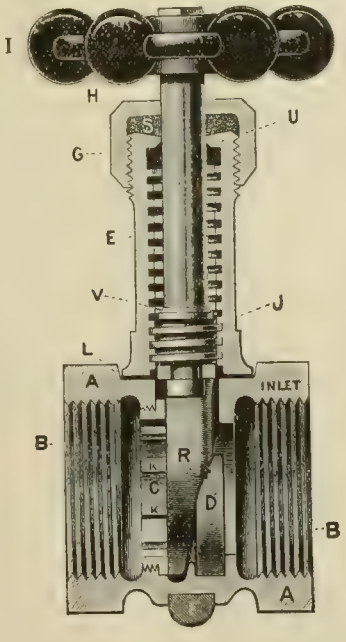


Fig. 2.—Longitudinal Section.

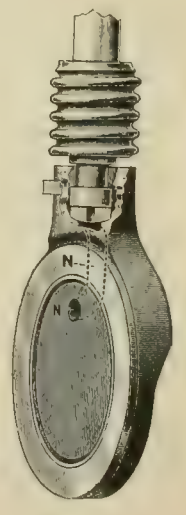


Fig. 3.—The By-Pass Valve.

THE LUNKEN GATE VALVE.

Channel N, Fig. 3, passing through the disk, connects the inlet or pressure side of the valve with the outlet side, and the end of the stem H controls this channel, there being sufficient play in the disk coupling to allow the complete opening of channel N caused by the first one-sixth turn of the wheel in opening the valve.

The renewable seat is an exteriorly threaded flanged ring that screws against a face or shoulder of the flange, the opposite side of which flange forms the seat or bearing surface for the disk to close against. The inner periphery of the renewable seat has lugs or teeth, K, Fig. 1, for the engagement of the spanner end of a wrench, by which means, after taking off the bonnet E, Figs. 1 and 2, the seat is tightened or loosened through the disk opening of the body without disturbing the pipe connections. In iron body valves the renewable seat C screws into a second brass ring, permanently fastened in the iron shell, otherwise, owing to the rusting qualities of iron, the removable seat might rust tight in the shell.

The wrench has a ring end which is used to hold and guide the removable seat into place, so as to properly start seat of the valve, because the disk and seat have a parallel straight face, and as the pressure on the back of the disk keeps it tightly pressed against its seat it cuts away anything in its path. This feature, combined with the renewable seat, commends this valve for blow-off purposes. As regards outside finish, the shape and construction are such that necessitate only the finishing of the stuffing box, the balance being left a smooth casting, while the steel band and nuts are drop forged and copper plated to prevent rust.

HEATING NOTES.

THE MILLS SYSTEM OF HOT WATER HEATING is described in a circular issued by W. B. Mills of Deckertown, N. J. The radiators used in this system are said to be of peculiar construction, and on this construction the success of the method depends. They consist of upper and lower chambers connected by upright pipes, each of the pipes being double, one within the other, leaving a small water space between them. The outer pipes are connected to the top of the lower chamber and to the bottom of the upper chamber, while the inner

scriptive circular relating to what they describe as their new radiator named the Holland. Special attention is directed to the connections used. The right and left hand stud bolts permit disconnection in a minute, if a leak is discovered. This, furthermore, can be done without removing the valve connection, and so avoids the necessity and expense of ending the radiator up to be swung off loop by loop. There are no nipples or screwed ends to come in contact with the steam or hot water to become rusted. The opposite faces of the loops are made male and female and a Jenkins' gasket put between them, the faces being brought together by right and left hand stud bolts located in an accessible place. These radiators, which are made for either steam or hot-water heating, are put up in from 2 to 32 loops and in five sizes, from 20 to 45 inches in hight. The 2-loop radiator is 5 inches in length, and built of the 32 inch section, contains 6⅜ square feet of heating surface. The loop is 7¼ inches and the width across the feet 9¼.

THE LUNKENHEIMER COMPANY, Cincinnati, Ohio, issue a cordial invitation to their friends and patrons when visit-

ing Chicago to see their exhibit installed in Machinery Hall, section 25, Column O 24, where they have a complete line of the Lunkenheimer specialties in charge of one of their representatives, who will take pleasure in showing and explaining the merits of their various productions. This greeting comes on a prettily printed double page circular issued by the company, and in addition to the text there is a neatly engraved view of Machinery Hall.

THE MACKAY MFG. COMPANY, 66 James street, Newark, N. J., are a recently organized concern for the manufacture of a number of specialties which are the invention of W. M. Mackay. Among the goods that the new firm are manufacturing and selling are the Mackay patent quick operating hot-water radiator valve and the Mackay mercury thermometer for hot-water heaters. Other goods are Union elbows, wrench plugs and lock shield air valves.

SEALED PROPOSALS will be received at the office of the Supervising Architect, Washington, D. C., until August 11, for the heating apparatus for the extension of the United States Custom House Building at Chicago. Drawings and specifications can be obtained at the office of the Supervising Architect, or the office of the superintendent at Chicago.

THE WALWORTH MFG. COMPANY, Boston, Mass., are now well settled in their New York office, having moved to 56 Beekman street, where the manager, E. P. Keane, has a fine line of samples of their specialties for steam, water and gas. A 12-inch Walworth gate valve, attractively painted, is fixed at one side of the entrance on the street to show the passing steam fitter that he need go no farther for pipe tools, fittings, valves and the Walworth goods.

"THE FAULTLESS FURMAN HOT-WATER AND STEAM BOILER" is the title of a handsome publication issued by the Herendeen Mfg. Company, Geneva, N. Y. The volume is a bulky one, containing over 200 pages, and begins with some interesting observations on the general subjects of steam and hot-water heating, incorporated in which is a thorough description of the Furman heater. Forty pages are given up to this matter; then comes a notice of awards to the Furman boilers, followed by tables of sizes and prices. The next division consists of testimonial letters, sprinkled among which are many engravings of the houses where the Furman heaters are installed. This part of the book covers nearly 170 pages. This, in turn, is followed by a long list of references of those who used the boilers. Accompanying this volume is a smaller treatise, being the second edition of "Home Warming and Ventilation," a collection of articles by various authorities. An invitation from this firm to those visiting the World's Fair is that they will be glad to have them call at their Chicago office, at 79 Dearborn street.

SEALED PROPOSALS will be received at the office of the Supervising Architect, Washington, D. C., for all the labor and material required to furnish and erect a new low pressure return circulation steam heating apparatus, including power boiler and all pipe connections and non-conducting material, for the Butler Building, Washington, D. C., in accordance with drawings and specifications, copies of which may be had at the office of the Supervising Architect.

A Notable Key.

At the recent inauguration of the Imperial Institute in London, the key which was presented to Queen Victoria, wherewith to perform the opening ceremony, was in its form and composition entirely unique, and well worthy of mention. The gold, silver and jewels of which it is made were contributed by the several Colonial governments under the British Crown, and by India, so that the different portions of the empire are represented by its various component parts. The head of the key is formed of gold from South Africa, the silver in the star ornaments of the handle comes from the Broken Hill Mine, Australia; the stem is formed of gold from British Columbia, while the bitt and wards are composed of the precious metal from Queensland mines. The stem of the key is enriched by a rib-band in red gold and a wreath of laurel leaves in green gold, both obtained from Victoria. The key and ornaments are set with diamonds from South Africa, rubies from Burmah, and pearls from Ceylon. The object is of beautiful and rich design, the head being circular, with the royal and imperial crown on the summit, and the Maltese cross with *fleurs-de lis* forming the outer border. The center of the key head displays on one side the jeweled star of the Colonial Order of St. Michael and St. George, and that of India on the reverse side. The national emblems —the rose, shamrock and thistle—surround the arms of Great Britain at the top of the stem. The stem and wards are decorated in accordance with the rest of the key, the wards forming the initials, I. I., of the institute. The key was the work of Chubb & Sons of London.

The following details are given by a Mexican journal of the tin deposits recently discovered near Guyanjuato, Mexico, by Frank Gordon, an American prospector: "Eight leagues from Silao and 14 from Guyanjuato there exists deposits of the class of tin known as 'kidney.' It is found scattered all over the district. The inhabitants collect it, smelt it in a furnace of primitive construction and sell it in the market at $29 per quintal. The veins in which the tin exists are still in a condition of primitive formation, and are what is known as 'vetas apartadas.' The tin in its metallic condition contains a good deal of gold, and for this reason obtains a ready sale. The average yield of ore is 50 per cent. of metallic tin. The beds from which the tin is extracted are covered with compressed sand, mixed with rubble and resembling concrete. Samples of 'kidney' tin have been taken out in this district weighing 5 pounds. Near the land where it is found exists sundry auriferous veins and large carboniferous croppings."

In a recent communication to the Paris Académie des Sciences M. Henri Moissan claims to have succeeded in forming diamond dust artificially. The plan adopted was to inclose some purified carbon in a wrought-iron receptacle, which receptacle was tightly closed by a screwed plug. Iron was then melted by the electric arc, and when quite fluid the iron bottle containing the carbon was placed in the molten mass. Afterward the crucible is rapidly cooled with water, forming a hard skin of solid metal round a still liquid interior. This fluid portion, solidifying later, endeavors to expand, as usual, and the consequence is it is subjected to a very high pressure from the unyielding wall of previously cooled metal. When quite cold the residue obtained on dissolving away the iron with hydrochloric acid is found to contain several varieties of carbon, among them being very dense and very hard particles, many of which are quite transparent, while others resemble carborads. These particles scratch the ruby, and have a specific gravity of 3.5. When heated to 1000° C. in a stream of oxygen gas they completely disappear.

The smokeless powder adopted by the English Government is known as cordite. It derives its name from its structure, the powder being made up of strings or cords of varying thickness, from $\frac{3}{1000}$ inch to $\frac{1}{3}$ inch in diameter. The thick cordite is cut in long strips of 14 inches. The cordite used in field guns is cut in strips measuring 11 inches in length. The small-arm ammunition is made up of 60 strands to a load. According to Colonel F. W. Burke of the British artillery the new cordite is a combination of nitro-cellulose and nitro-glycerine. The combination is 37 per cent. gun cotton, 58 per cent. nitro-glycerine, and 5 per cent. vaseline, to which is added a proportion of acetone distilled from wood. The mixture takes on a stringy form. In a magazine rifle a charge of 70 grains of black gunpowder gives a velocity of 1830 feet a second, while 30 grains of cordite gives the same bullet a velocity of 2000 feet.

The manufacture of thermometers, barometers, and kindred instruments, is an industry which is a comparatively recent one in the United States. But a few years ago most of these instruments were imported from Germany, or other parts of Europe. Now, however, American firms are turning out thermometers and barometers which are equal and in some respects superior to any made in the old world. The American "Standard" barometer, for example, is considered the best in existence; while thermometers of all kinds are turned out from American factories which will compare favorably with any of foreign make. In the manufacture of special instruments—as lactometers, urinometers, acidometers, pyrometers, &c.—the trade is so far held by foreigners, but it is stated to be only a question of time when these and other articles in the same line will be made in the United States so cheaply as to enable American manufacturers to export considerable quantities besides supplying the home market.

Wire glass for architectural purposes appears to be now manufactured in Germany. A contemporary states that material of this description, made in Dresden, was recently tested at Berlin in order to try its fire-resisting qualities. Plates of wire glass are said to have been placed in three different situations, as roof lights and walls, in the testing structure, and, after being exposed to high heat, showed no damage beyond a few unimportant cracks. The fact was, however, ascertained that sheets of this glass, to be properly employed in fireproof construction, must be securely fastened to the iron frame work in order to prevent their falling out whole when the iron is softened by the heat. We learn that the material has been awarded a prize by the Government commissioners in charge of the tests.

TIN PLATES.

Tin Plates and the Tariff.

It can be announced with the utmost confidence, writes our Washington correspondent, that it is the determination of Secretary Carlisle, as far as his department is concerned, among the other recommendations in the direction of a long list of articles to be put on the free list, to add the repeal of the provisional $2\frac{2}{10}$ cents tin-plate duty.

The grounds for this announcement is the fact that the Treasury officials, who are tinkering with Special Agent Ayers' report on the production of tin-plate in the United States under the statute, have for some weeks been making a very searching examination of the proceedings during the protracted discussion of the tariff in the Fifty-first Congress. They wish to find some justification for such a course in the general tone of the debates and the admissions and alleged contradiction of facts and figures in sustaining the imposition of the specific duty, and the provisional legislation leading to free tin-plate if the development of the home manufacturer did not come up to a certain relation to importation of foreign tin in a given time.

In event of failure to find sufficient grounds to satisfy their official consciences in favor of absolute and immediate repeal, the Treasury officials have also been examining the debates on the provisional portion of the tin-plate legislation in order to ascertain whether in the tinning of imported black sheets the product was to be considered as American tin plate and to be included in the statistics of American production. The department has not confined its inquiries to the home sources of information, but has instituted inquiries into the interpretation of these conditions in Wales. They wish to find out whether English black sheets tinned in Wales are embraced under the head of tin plate manufactured in Wales, or whether the tinning does not cover the black sheets to the extent of making them Welsh tin plates. The department is making determined efforts to get tin plate on the free list, if not by recommending what would be nothing short of a breach of faith by Congress with the American manufacturers—that is, immediate repeal—then by making it appear that the aggregate quantity of tin plate lighter than 63 pounds per 100 square feet produced in the United States during either of the six years next preceding June 30, 1897, has not equaled one-third the amount of such plates imported and entered for consumption during any fiscal year after the passage of the act and prior to the above date.

The exclusion of foreign plates tinned in the United States from the statistics of the home product of tinned plate would make a serious difference, as may be seen from the product of 1891–2 fiscal year, July to June, when the relation stood:

	Pounds.
Amount of tin plates made from American black plates	9,300,000
From foreign black plates	4,300,000

These figures were more unfavorable from the department standpoint in the last two quarters of the calendar year of 1892, viz.:

From July 1 to December 31, 1892.

	Pounds.
Tin plates from American black plates	14,000,000
Tin plates from foreign black plates	17,000,000

There is a fixed determination to attempt some very radical so-called revision or reform of the metal schedule under the tariff act of 1890.

SCRAP.

THE COST of a tin-plate manufacturing plant in the South Wales district is estimated at $14,400 per mill, including all the necessary appliances.

JAMES B. SCOTT & Co., Pittsburgh, Pa., issue a colored circular directing attention to Scott's 'Extra Coated Guaranteed American Roofing Tin. They say that they have had two years' experience in manufacturing this brand in their factory in Pittsburgh, and have spared neither time, pains nor expense in its production. Describing this plate, they speak of it as made of superior quality American soft steel, each sheet accurately resquared, coated with the best refined block tin and lead, and only strictly prime Lagos palm oil being used.

THE TIN-PLATE WORKS of Somers Bros., Brooklyn, have been shut down temporarily.

THE LEECHBURG FOUNDRY & MACHINE COMPANY recently shipped to the Cumberland Steel & Tin Plate Company, at Cumberland, Md., a 20-inch tin mill, and a 36-inch doubling shear with engine attached, and one Mesta patent automatic pickling machine. The addition of this equipment will allow the latter named concern to more than double their present output.

THE STORE of tin in the mines of the Straits is said to be practically inexhaustible. A recent report from that district says that, in the opinion of practical men, these mines have been only superficially prospected so far. As more than half the tin supply of the world is obtained from the Straits, scarcity of the metal need not then be feared. The output of the mines has steadily increased of late years, and the increase is likely to continue. The following figures show the exports in tons:

1887	27,549
1888	29,169
1889	33,021
1890	31,976
1891	36,061

For the years 1890 and 1891 the principal shipments from the Straits, by countries, were as follows, the picul being $133\frac{1}{3}$ pounds:

	1890. Piculs.	1891. Piculs.
United Kingdom	267,238	293,024
Austria	5,295	4,035
France	40,935	45,446
Germany	2,102	2,532
Holland	14,304	18,355
Italy	3,698	6,676
United States	118,243	163,647

These figures show a marked increase in the shipments to the United States, which may be attributed to the establishment of the tin-plate industry in this country during the latter half of 1891.

A Knotty Point of Equity.

How controversial we are as a people and how prone some of us are to carry a point to an extreme, writes "Vulcan," in the London *Ironmonger*. This was well illustrated recently. Early one morning an assistant in a hardware store put some bread platters in his window, each one being ticketed with its price. Later on, to improve the display, he laid some knives on the platters, and then, feeling satisfied with the result, went on with other work. But before many hours had passed a knotty problem presented itself. A customer came and claimed a platter and knife at the price of the platter alone. When the claim was resisted he said some very hard things. It was explained to him that the platters and tickets were put in first and the knives added afterward as an afterthought. This explanation would have satisfied most people, but it was useless in this case. The customer stoutly protested that legally he could demand the goods and he was determined not to forego his legal rights.

Here was an opportunity for controversy much too tempting for two Englishmen to miss. The buyer's claim was this—the knife lay on the platter, "and therefore," said he, "the ticket on the platter referred to both articles." The seller resisted this on the ground that there was nothing on the ticket to indicate that it referred to more than the single article on which it rested. The dispute was carried on with spirit, and might have lasted all day but for the intervention of the principal, who, while showing the buyer the unreasonableness of his claim, freely admitted that the tickets were ambiguous, and then offered to adopt the buyer's own interpretation and let him have the knife free. It was truly comical to see the change this effected. At first the buyer wanted, by means of a quibble, to get more than his due; now he refused to have the goods at other than full price. It was delightfu to see the seller urging him to take the knife for nothing, and the buyer begging to be allowed to pay for it. At length a settlement was arrived at, and the whilom opponents parted on the best of terms. Tact is sometimes more useful than talent.

As illustrating the curiosities of trade and manufacturing economy, an English contemporary states that thin sheet iron is being sent from South Staffordshire into Germany, where it is worked up into wrought hollow ware and other kindred goods and sent back to England, where it meets with a ready sale, underselling in price English pro ductions of the same description.

THE RETAIL STORE.

The Profit of the Hardware Business.

BY WM. H. MAHER.

In these days there is no branch of business in which competition is not sharp and aggressive, but in some lines of trade it is much more severe than in others.

For instance, the average man supposes because he is a consumer of groceries that no special experience is required in buying and selling groceries over a counter. Hence men start in that business without experience and with little capital. How little is evidenced by an incident coming to my knowledge within a few days, where application was made by a man and his wife for credit for a stock of groceries. It developed that they had $50 in cash and no experience in business, but considered themselves well equipped for starting a small grocery. They were advised to wait awhile until their capital was larger, but the chances are that they found a salesman who proposed to have that $50 and the trade of this pair of merchants.

Every man believes that he can weigh out and do up sugar, draw molasses and vinegar as well as any other man. The consequence is that men start a grocery and cut prices to draw trade, fail, and are succeeded by other ambitious and equally ignorant men.

The dry goods trade is constantly recruited from its own ranks, usually from men who have been heads of departments. They have been permitted to buy their own goods, and, to a very large extent, have also had influence in making prices at which the goods shall sell, and are firmly convinced that they know the dry-goods business from A to Z.

The general expenses of running a store are a mystery to them. The acquaintances they have made in the way of business they look upon as personal, and their trade a tribute to their own popularity. They impress their acquaintances with their supposed popularity and ability, and induce their friends to help them into a store of their own.

Finding that the people who formerly traded at their counter do not follow them, they are obliged to offer inducements by cutting prices, and there is so much of this that the dry goods business of the country has become one of small profits, and to be successful must be backed by ample capital and command large sales.

The drug business is one that demands long apprenticeship, if the owner of the store would be independent of his clerks. The druggist must be a chemist to make his prescription business profitable, yet his worst competition is from druggists who are without experience, and who depend upon clerks for all the technical knowledge needed in the business.

Aside from this, what was formerly the most profitable part of the drug business, patent medicines and proprietary articles, are to-day made leaders and baits in department stores, and they will probably continue to be so used, for extensive advertising creates a demand for them, and the regular prices are so well known that a cut price is at once understood by the public.

The Hardware business is not one that attracts the majority of young men. It is not of itself a stepping stone into "society." It offers no inducements to the dudish young man who thinks more of his clothes than of his brains. It does not attract the superficial man who is more exercised about the wages he receives to-day than the position he will have a few years from this.

Competition in the Hardware trade is rather one of brains and ability than one where men simply expect success by underselling each other.

There is no special rush of men into the Hardware trade in any given locality. When a man who has been a Hardware clerk prepares to start in business for himself, he has learned that capital is necessary and that business is not created in a day.

The young man who is about to select a business should consider his own tastes and adaptability, the position any given trade occupies as a money-maker, and the means it offers of gaining the acquaintance and good-will of his fellow men.

He will see that a very large percentage of the customers of a dry goods merchant or grocer is composed of women and children. The hardwareman deals as largely with men. His principal trade is with farmers, builders, mechanics and manufacturers. These are the men who make a village or city. These are the men whose personal acquaintance is of value in business and helpful in social and political life.

When one compares the stable character of a stock of Hardware with the unending changes of fashion in a dry goods store, or the great loss from perishable goods in the grocery store, the business commends itself because of this. Ninety-five per cent. of the stock in a Hardware store is as salable to-day as it was a year ago, and will be just as merchantable a year hence.

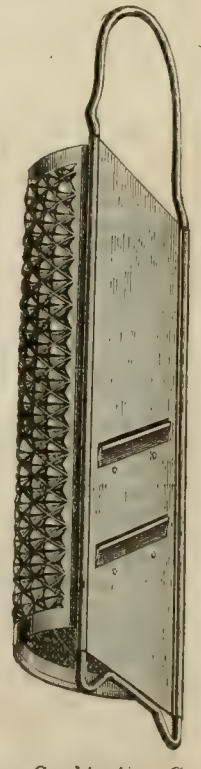
The expenses of running a Hardware store are, proportionately to the business done, much less than in other lines. The store needs not to be located on a principal street, clerks are not required to wait upon shoppers, for a Hardware store does not tempt that class; and customers, being mostly men, generally carry their purchases away with them.

The Hardware business is pre-eminently a business for men. It is a manual training school for an intelligent boy or young man. The salesman who would be successful in selling Tools and Machines must know how, when and where they are used. He must be able to take apart and assemble any machine, tool or weapon that he sells and educate purchasers to do this. This will be conceded by any one who has knowledge of the business, and, being conceded, it is one very strong reason why the Hardware trade is not sought by the mass of men who are looking after easy places.

To the young man who is seeking a field that will pay him best in money profits, as well as bring him into intercourse with the best men in his community, it can be said, with the confidence born of both observation and experience, that the Hardware business offers the most hopeful outlook and the greatest measure of success.

The Spery Combination Grater and Slicer.

Chicago Hardware Specialty Company, 149 Lake street, Chicago, are introducing the above article, as herewith



The Spery Combination Grater and Slicer.

shown. The article is made of the usual sheet grater, having, however, a galvanized-iron back, in which are inserted two steel knives for slicing. The blades can be taken out for cleaning, or to be used separately. The manufacturers state that the article is strong and durable and that its combination is desirable.

Arrangement of Stores.

Weed & Co., Buffalo, N. Y., are proprietors of the "Old Hardware Store," established in 1818, to which the accompanying illustrations relate. Although the business is old in years, the store is modern in arrangement, as the fact is recognized that well-displayed goods are more easily sold, and that the lines bearing the best profit are the ones to push to the front. The store is a double one, having shelving on each side of the partition and also against each side wall, the two rooms being connected by passageways, one of which is shown in Fig. 1. This represents the front of the middle or partition shelving, the opening in front extending to the store front.

The shelving extends to the ceiling, and is filled with sampled wooden boxes to a considerable hight. Above these stock is kept in original packages, the whole being reached by a traveling ladder. This shelving is devoted to Tape Measures and Carpenters' and Mechanics' Tools. The boxes are finished in natural wood, each with a drawer pull; and in addition to the samples, in the case of Tapes, the kind and length are stenciled on each box.

A showcase devoted to Pocket Cutlery runs around the front of the partition, and the shelving is arranged in the same manner on the other side. The goods sampled here are Cork Screws, Drawer Pulls, Conductors' Punches, Jack Chain, House Numbers, Ice Picks, Wire Picture Cord, Screw Hooks and Eyes, Butts, Casters, Match Safes, Lemon Squeezers and miscellaneous goods of this character. On the end of the partition Thermometers, Bird Cage Hooks, Key Chains, Bird Cages, &c., are sampled. Counters and showcases are in front of the shelving on each side of the partition.

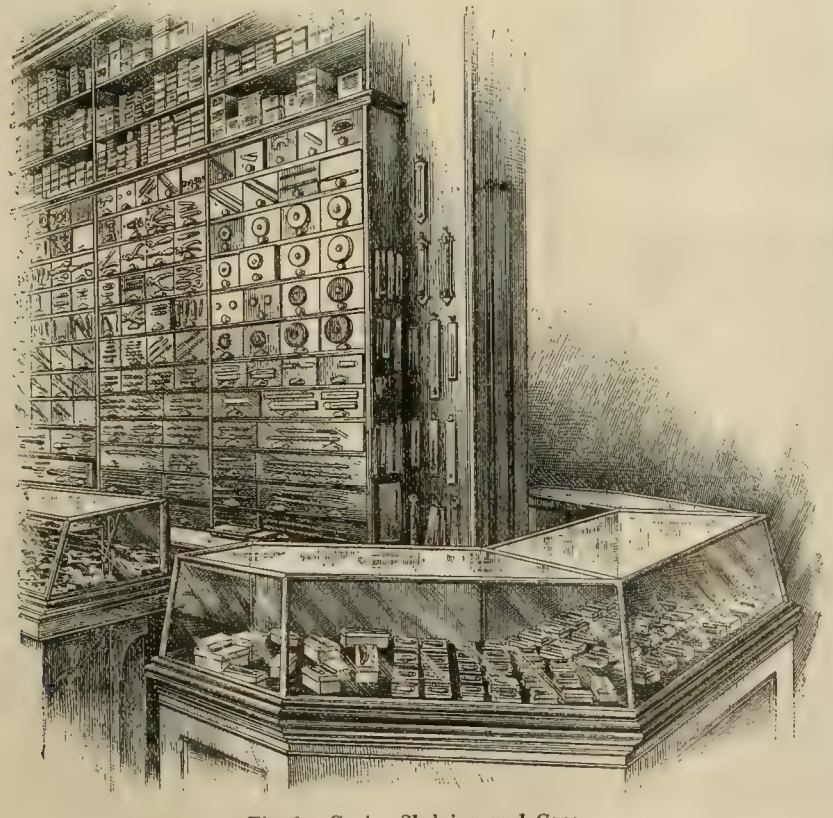


Fig. 1.—Center Shelving and Case.

On the side of the store opposite the shelving in Fig. 1, is a wall case extending back about half the depth of the store. A portion of this case is shown in Fig. 2. This is devoted to Hand, Meat and Back Saws, Hammers, Hatchets, Planes, Plumbs and Levels, &c. The showcase immediately in front of it contains smaller Planes and fine Tools. Duplicate stock of Saws is kept in the original boxes underneath the case.

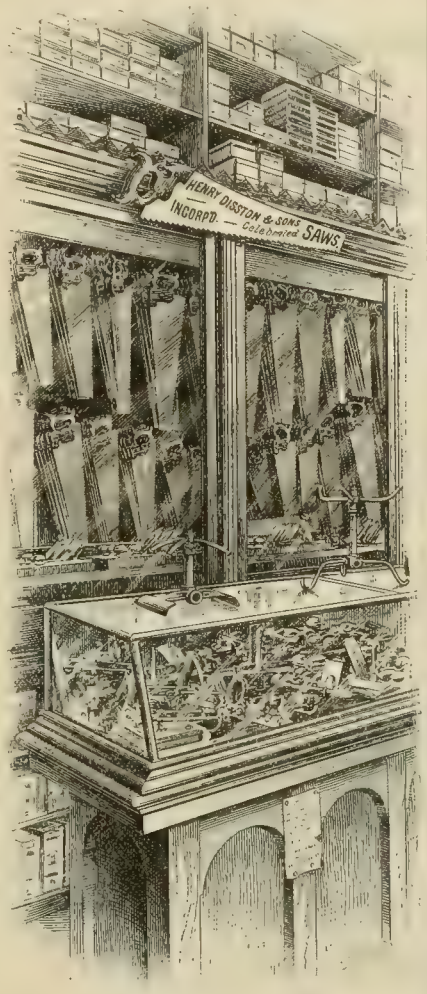


Fig. 2.—Saw Case and Tools.

The arrangement of Carvers is shown in Fig. 3, the case being against the wall in the other part of the store. This method of arrangement allows of four lines of shelving, two in each room, with a corresponding number of counters. The shelving all extends to the ceiling, and each line is provided with a traveling ladder. A system of cash carriers is also provided for each line of shelving.

The glass doors in front of the Saw and Cutlery cases are hung on weights, and push up out of the way. The boards on which the Carvers, Steels, &c., are sampled slant from the front at the bottom of the case, to the back at the top. The showcase in front contains Silver-Plated Knives, Forks and Spoons; with samples of Fancy Handled Table Knives against the back, held in an upright position by a band attached to the back of the case.

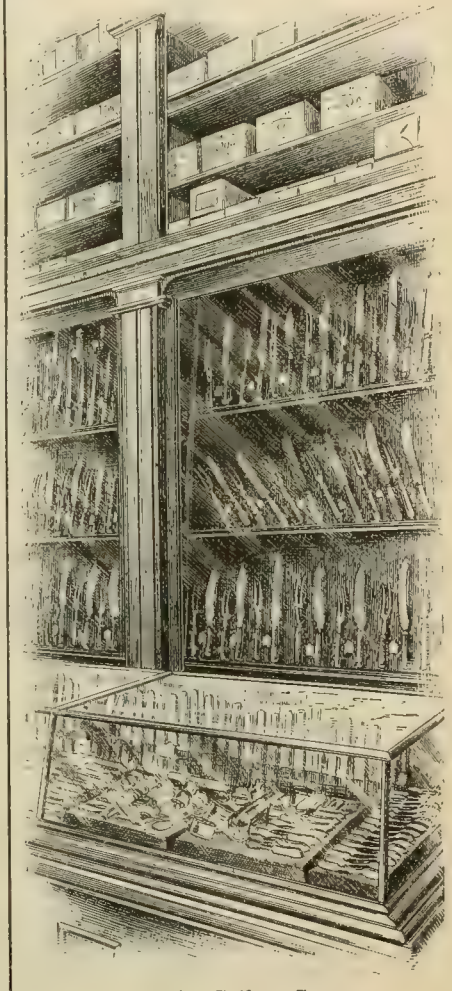


Fig. 3.—Cutlery Cases.

A handsomely fitted up room in another part of the store is devoted to samples of builders' fine Hardware. Drawers or slides with fronts but no sides, finished in natural wood, contain samples of long Escutcheons and Knobs, Butts, Bell Pushes, &c.; while on the ledge over the drawers stand mounted Locks and Knobs. If the line of goods on any particular drawer is to be shown, the drawer is taken out and stood up against the ledge, the bottom resting on a lower slide drawn partly out for that purpose. On the opposite side of the room is a wide counter.

The arrangement for each line of goods throughout the stock has received the same care and attention as those already referred to.

The Monroe System of Refrigeration.

The Monroe Refrigerator Company, Lockland, Ohio, the West & Tice Company, 139–141 West Fourth street, Cincinnati, agents, are introducing a system of refrigeration in their No. 5 refrigerators, as shown in the accompanying cuts. Fig. 1 shows the interior construction of the refrigerator, while Figs. 2, 3 and 4 represent cross sections of the apartments, the numbers of the cuts indicating the position the apartments occupy in the refrigerator. The top apartment is provided with ice rests upon which the ice is placed. The system of refrigeration is explained as follows: The air becoming chilled and heavy passes down the air flue D, as indicated by the arrows in Fig. 1, and into the provision compartments of the refrigerator, forcing the warmer air upward through the air spaces 1, 1^1, 1^2, 1^3, 1^4 and 1^5 in front and behind the provision compartments in Figs. 3 and 4, to the return flues 1^6, 1^7, 1^8 and 1^9 in Fig. 2; through which it continues to the top of the ice apartment, as indicated by the arrows at the top of Fig. 1, to the ice where it is chilled and passes down through the flue D, thus keeping a continuous circulation so long as there is ice in the refrigerator, causing the entire atmosphere within the refrigerator to pass over the ice every few minutes. It is stated that all vapors and minute particles given off by the food are thus carried to the ice where the vapors are condensed and the minute particles deposited and carried off by the drippings which pass down the sides of the flue D, and out of the refrigerator through the drip pipe and trap O. The point is made that as all vapors are condensed on the ice the provision compartments are free from sweating and that matches could be kept in them in perfect condition for any length of time; also that the water from the ice, in passing down the walls of the air flue, assists in cooling the refrigerator, thus utilizing every particle of ice. The trap at the bottom of the refrigerator is to form a water seal to prevent air or heat from entering through the drip pipe. The manufacturers claim that the movement of the air in the provision compartments being only from the bottom of the refrigerator upward, there will never be any mixture of flavors or tastes if all food likely to give off odors is placed in the top compartments, as the air from these compartments passes over the ice and is purified before it again enters the other compartments; also that by the air being conducted directly from the ice to the lowest parts of the refrigerator before it enters the provision compartments, a low temperature is secured at the greatest distance from the ice, hence the lowest possible temperature throughout the refrigerator.

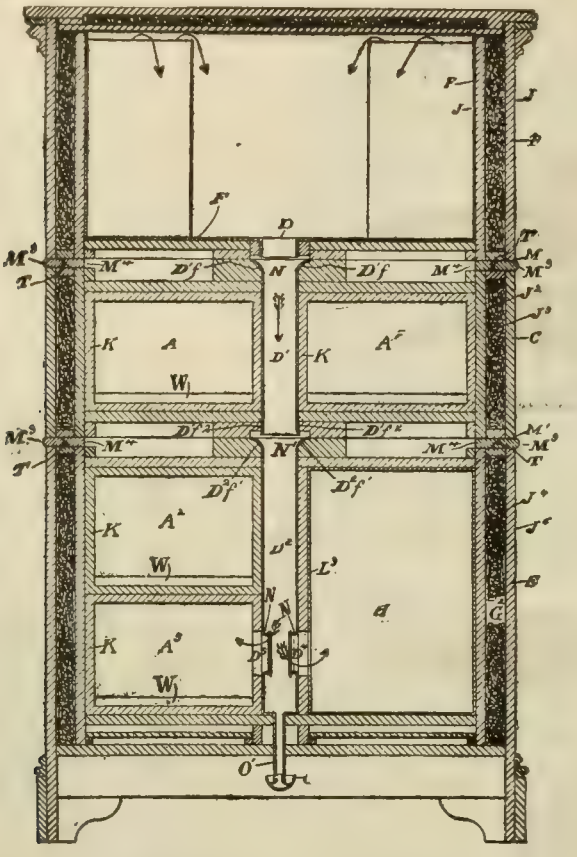


Fig. 1.—Interior of Refrigerator.

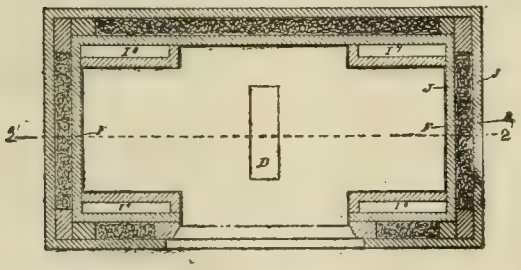


Fig. 2.—Ice Chamber.

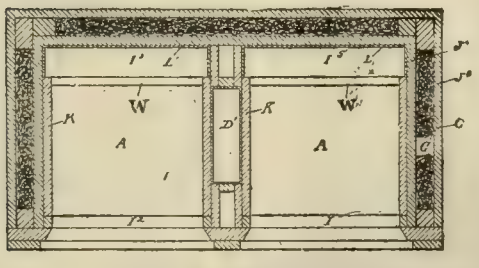


Fig. 3.—Apartment Under Ice Chamber.

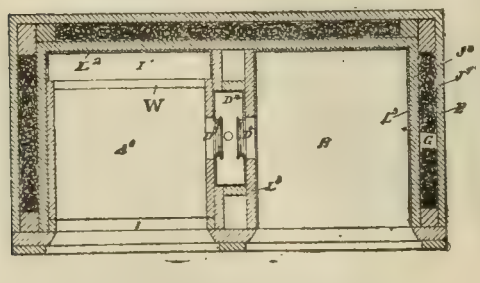


Fig. 4.—Bottom Apartment.

THE BUSINESS OF THE AVERY STAMPING COMPANY, Cleveland, Ohio, was placed in the hands of a receiver Wednesday, July 26. Application for the appointment of a receiver was made by the Junction Iron Company of Steubenville, and Douglas Perkins was unanimously requested to be appointed receiver. The assets of the company are placed at upward of $400,000 and the liabilities at $300,000. The officers of the company are Ralph A. Harman, president; Douglas Perkins, vice-president; Joseph Perkins, secretary and treasurer, and Henry W. Avery, manager. President Harman in an interview said that in ordinary times the company have had no trouble, that on July 1 their balance sheet showed assets amounting to $505,000 and liabilities $296,000 and their business was prospering until it became difficult to obtain ready money. Upon consultation with the Junction Iron Company they decided to take action toward keeping the business in their own hands rather than assign it absolutely to another. President Harman said that he hoped that matters would be adjusted so that operations would be resumed about the middle of August.

Tongs for Handling Ice, Small Fruits, &c.

The Unique Mfg. Company, 35 Murray street, New York, are marketing a novelty, as illustrated in Figs. 1 and 2.

Fig. 1.—Sugar or Fruit Tongs.—Half-Size Cut.

Fig. 1 represents the article, which is offered as an improved medium for daintily serving loaf sugar, bon-bons,

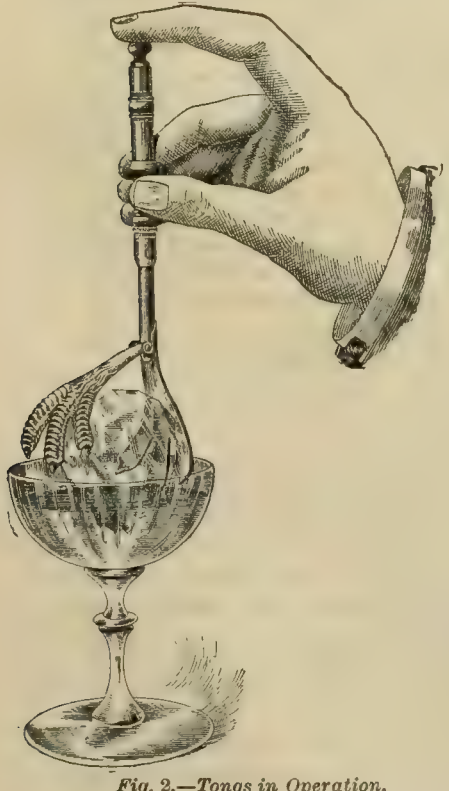


Fig. 2.—Tongs in Operation.

cracked ice, mixed pickles, olives, &c. especially if necessary to extract them from a bottle, or small fruits of any kind. Fig. 2 shows how the tongs are operated. The projecting ring on the handle serves as a purchase, permitting the knob at the top to be pressed, forcing the hinged claw open while the other remains rigid. By means of a spring in the tube, when the pressure is released the object is caught and removed. The goods are 6¼ inches long, plated, and packed in individual boxes.

Improved American Waffle Iron.

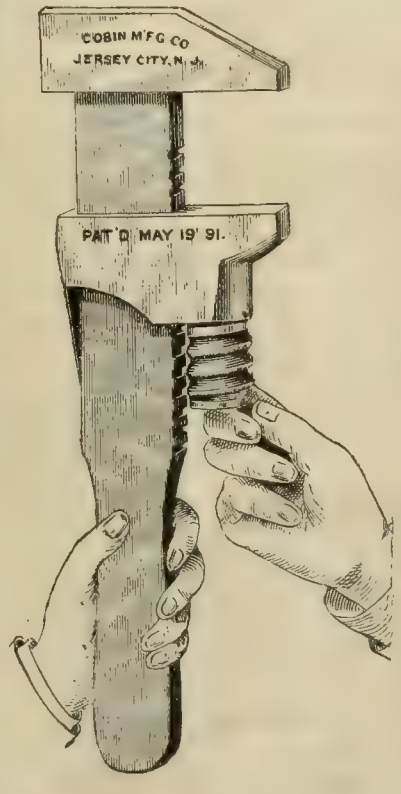
The accompanying illustration shows what is described as the new improved American waffle iron, put on the market by the Griswold Mfg. Company of Erie, Pa., the well-known manufacturers of the Erie hollow ware. This waffle iron is described as very simple in

Improved American Waffle Iron.

construction and can be used on gas or gasoline stoves. A special feature, as shown in the cut, is that the pans can be taken apart to clean. Another point that will be appreciated is the long wood handles, which prevent all danger of burning the fingers.

Adjustable Wrench.

Cobin Mfg. Company, 107 Chambers street, New York, have brought out a



Adjustable Bicycle Wrench.

wrench, as here shown, which, at present, is being made in the 5-inch size for bicycle and similar purposes, but which later they expect to furnish in all the regular sizes to 15-inch inclusive. The principal feature to which the company call attention is the ease and rapidity with which the movable jaw can be adjusted to any size within its capacity. A flat steel spring, riveted to the back of the movable jaw, permits the screw to be pulled out, so as to release it from the grooves in the bar, while a close adjustment is effected by turning the screw to right or left. It can be used either as a ratchet or screw wrench. We are advised the bar is drop forged from bar steel and case hardened. The wrenches are made both bright and nickeled.

More Spelling Bee Suggestions.

Some weeks ago we gave some "Suggestions for a Spelling Bee," based upon the names of certain articles in a chemical journal, which may, perhaps, have given a shock to those of our readers who were not previously familiar with the strange language used to express their thoughts by the professors of the occult science of chemistry. Should they wish to make further researches into this interesting subject we should recommend a study of the May number of the same journal, where ample food for reflection on the possibilities of the English (?) language in the production of compound words will be found. If they wish it, they can there be instructed in the preparation of paradiazometatoluenesulphonic, parametho-xymetasulphaminebenzoic, and para-amidoorthotoluenethiosulphonic acids. These processes, as we should naturally expect, appear to be lengthy ones. Many pages are devoted to them, portions of which are a trifle abstruse. As, for instance, when we are told that an eminent chemist "when studying paraamidotolueneorthothiosulphonic acid had changed this thiosulphonic acid into the corresponding sulphinic acid. On diazotizing the paraamidoorthotoluene-sulphinic acid, and decomposing the diazo compound in absolute methyl alcohol, he obtained a non-crystallizing acid which he called oxymethyltoluene-sulphonic acid."

A question that occurs to one's mind in this connection is whether the initiated, in general conversation, pronounce these awe-inspiring words in full, or whether they have pet names for them. If not, the articulation of these terms must take up a great deal of their time. Probably they have to undergo a special course of training in it.

A foreign journal speaks of an invention which has just been perfected in Liverpool, and which it is thought will effect a revolution in lamp wicks. A small piece of asbestos web is inserted in the end of an ordinary lamp wick for about ¾ inch, a very small portion of the asbestos web appearing above the wick, and the result of this arrangement is to increase the power and usefulness of the wick. It is claimed that experiments have indicated an increase in the intensity of the light of an ordinary lamp from six candles to eight candles, while the life of the new wick is asserted to be practically everlasting, an experiment conducted with a ship's side light for 600 consecutive hours showing no appreciable effect on the wick. It is also claimed that no trimming is required after the first adjustment, and that the combustion is so perfect that neither odor nor smoke can be perceived.

TRADE REPORT.

The Iron Market.

Stagnation prevails in all the leading markets and in all branches of the Iron trade. Very few plants throughout the country are running anywhere near full capacity and restriction of output or complete closing down is the order of the day. Consumption of raw and finished goods is at a low ebb, a good many orders have been canceled, and in many instances delivery of goods is withheld until it becomes quite clear that prompt payment is forthcoming.

The one danger feared is that the financial stringency, which has until now been confined to the wholesale trade and to manufacturers, will spread to the retailers throughout the country. The discharge of many thousands of men will restrict sales and will put pressure for credit upon the small merchants.

Pig Iron.—The New York market is dull, and new business is scarce. Deliveries on old contracts continue fair in volume, although postponements are quite frequent. Lower prices are being made for Southern Iron. We quote Northern brands $14.25 @ $15 for No. 1; $13.50 @ $14.50 for No. 2 at tidewater. Southern Iron, same delivery, $13.75 @ $14.50 for No. 1; $12.25 @ $13.25 for No. 2; $12 @ $12.25 for No. 3; $12 @ $12.25 for No. 2 Soft, and $12.50 @ $13 for No. 1 Soft.

Philadelphia advices show the Pig Iron market in that section to be extremely dull, price being no inducement, except to those who need material. Money is scarce, even with the best concerns, so that the bulk of the business done is in small lots, and in most cases at about the figures quoted below, although buyers with money in their hands can get almost anything required at concessions from quoted rates. Quotations for Philadelphia and nearby points are about as follows:

American Scotch, No. 1X	$16.00	@	...
American Scotch, No. 2X	15.00	@	....
Standard Penna. (Lake Ore), No. 1x	14.75	@	$15.25
Standard Penna. (Lake Ore), No. 2x	14.00	@	14.50

Production is being largely restricted everywhere in the Pittsburgh district, which is undoubtedly good policy, and will favorably affect the situation. Numerous furnaces have blown out and others are likely to do so this month. Buying is reported as about at a standstill in Pittsburgh, and is not likely to improve until there is more activity at the mills. Quotations as follows:

No. 1 Foundry	13.25 @	13.50	cash.
No. 2 Foundry	12.25 @	12.50	"
Charcoal Foundry No. 1	17.00 @	18.00	"
Charcoal Foundry No. 2	16.50 @	17.00	"

Advices from Chicago report that inquiries for round lots of Southern Pig Iron have sprung up recently, and if they were all to be placed the volume of business would be remarkably good in that line. Buyers, however, seem to be looking for special bargains and will not pay present prices for future delivery. Purchasing is therefore confined to hand-to-mouth quantities, on which current prices are being paid. Local Coke is neglected and Lake Superior Charcoal has been without movement for some time. A better tone financially is reported along the Pig-Iron houses so far as collections are concerned. Shipments, however, are so extremely light and new business is so small that it amounts to almost a complete suspension of trade. The following quotations are subject to concessions for prompt cars and immediate shipment.

Lake Superior Charcoal	$16.00 @	$16.25	
Local Coke Foundry, No. 1	13.50 @	14.00	
Local Coke Foundry, No. 2	12.75 @	13.00	
Local Coke Foundry, No. 3	12.50 @	12.75	
Local Scotch	14.00 @	15.00	
Ohio Strong Softeners	15.75 @	16.25	
Southern Silvery, No. 1	@	14.50	
Southern Silvery, No. 2	@	14.00	
Southern Coke, No. 2	12.75 @	13.00	
Southern Coke, No. 3	12.25 @	12.50	
Southern, No. 1, Soft	12.65 @	13.00	
Southern, No. 2, Soft	12.00 @	12.25	
Tennessee Charcoal, No. 1	16.50 @	17.00	
Alabama Car Wheel	@	18.85	
Hocking Valley, No. 1	15.25 @	15.50	
Jackson County Silvery	16.75 @	17.00	

The volume of business in Pig Iron in Southern markets continues very restricted. The demand from the East and the Northeast for Southern Iron has fallen off, so that sales for the week are smaller than they have been at any time during this season. A further reduction in the output is reported, but there is an ample supply of Iron offered for all the wants of the trade. What little demand there is for Pig Iron is mainly for foundry grades, and is freely furnished at the inside quotations, which are the same as a week ago, namely:

Foundry.

Southern Coke, No. 1	$12.75 @	$13.00	
Southern Coke, No. 2	11.25 @	11.50	
Southern Coke No. 3	10.75 @	11.00	
Ohio Soft Stone Coal, No. 1	15.50 @	16.00	
Ohio Soft Stone Coal, No. 2	14.50 @	14.75	
Lake Superior Coke No. 1	15.00 @	15.25	
Lake Superior Coke No. 2	14.00 @	14.25	
Hanging Rock Charcoal, No. 1	18.50 @	19.00	
Hanging Rock Charcoal, No. 2	17.50 @	18.00	
Tennessee and Alabama Charcoal, No. 1	14.75 @	15.00	
Tennessee and Alabama Charcoal, No. 2	13.75 @	14.00	

Car Wheel and Malleable Irons.

Standard Southern Car Wheel	16.75 @	18.00	
Lake Superior Car Wheel and Malleable	17.25 @	17.50	

Metal Market.

Pig Tin.—There has been moderate fluctuation in prices, and the net result is that the market stands practically the same as it was a week ago. The exception is that sales of spot stock and deals in "futures" are harder to work in the face of an apparent reduction of 1600 tons in the visible supply on this side of the Atlantic during the past month, and data showing shipments of only 900 tons from the Straits during the last half of July, or a total of 2425 tons for the entire month, against 3500 tons in July last year. Monetary stringency has some weight as an offset to the McKinley duty and the 8300 tons in stock here, as per Metal Exchange records, is an obstacle of no mean description. In any event the heavy spot stock has thus far proved a stumbling block in the way of efforts to raise prices to a parity with present cost in foreign markets. Meanwhile the demand from consumers is very moderate, and principally for small lots at a time. Current prices are for Banca and Straits Pig, 21½¢ and 21¢, respectively, for lots of less than 500 lb. These prices would be considerably shaded on orders for larger quantities for spot cash.

Copper.—Business has been quite as slow as it was during last week and evidence is wanting of any increase in demand from home consumers. Naturally, prices have softened and the market has shown additional signs of weakness. Still, producers hold against adverse conditions in remarkably good form, and, up to date, the decline appears more superficial than real. Orders are small, and of a hand-to-mouth character, and jobbers are holding very light stocks.

Sheet Copper.—The demand is of the slightest nature. Prices for small lots are, however, unchanged, as per list.

Pig Lead.—Business to a fair extent has been effected, but the market is feverish, with rather weak undertone, suffering more or less from the financial situation and general depression in business circles. The best offers of stock for prompt or future delivery receive but little attention. Quotations for small lots are nominally 4¢, and 3.75¢ for ton lots; but these figures might be slightly shaded for cash orders. Consumption shows some falling off, with little to indicate any immediate revival.

Spelter.—Free offering has failed to stimulate business in the slightest degree. Enough stock comes out to keep prices down, but nothing points to any increase of demand in the near future. Western Spelter in small lots is quoted at 4.75¢ @ 5¢.

Sheet Zinc.—The present month, which is always the dull season for this

material, is an exceptionally quiet one this year. Business is almost at a standstill, and the demand, such as it is, is of the slightest. Prices are, however, steady at 7¢ ℔ lb on small quantities, and 6¼¢ for 600-lb casks.

Antimony.—The market remains dull and prices are unchanged at 10½¢ @ 11¢.

Tin Plate.—There has been no improvement in the demand for spot stock or future deliveries and the market presents a dull appearance. Sellers' prices remain about as they were a week ago, but concessions have been the rule where anything in the nature of desirable orders was involved. Importers have been sending over very light orders for foreign plates, not desiring to lay in any unnecessary stocks in view of possible tariff changes. Jobbers are for the same reason, and also on account of the money difficulty, holding off purchases of more stock than they can dispose of out of hand. Shipments of Tin Plates from British ports for the week ending July 22 showed a considerable falling off from the previous week. Business in Tin Plates in Great Britain was reported by cable on August 2 to be quite flat, and Ternes and Black Plate were at the same time quiet and apathetic, makers claiming that present prices leave no margin of profit and that they cannot do business on the ruling rates. Stocks in makers' hands were large and increasing, with light orders only coming in. The *Iron and Steel Trades Journal* of London on July 22 states that the business in Ternes was light on account of "the home trade in America having robbed the English market of considerable business." In the New York market the demand for Charcoal Brights is very small, prices in this line showing some signs of weakness. Spot cash could probably obtain concessions for moderately large orders of 12½¢ to 25¢ off lowest quoted rates for imported Brights. Coke plates are in intermittent demand, but for light amounts, principally from canners who have not laid in quite sufficient stock. The business done in this material is, however, of a very narrow character, and does not appear to approach expectations. Some jobbers, however, see indications of a revival in the fall, when canners may be forced to purchase. Many of the newly started canning factories in the South have held over operations for this season on account of the impossibility of obtaining accommodations from the banks, and the same reason has militated against the industry further North. For domestic Ternes there is a fair, steady demand, which is well filled by those works which are now running. The financial depression by causing the abandonment of much projected building has told on the market for roofing plates to a great extent. Prices of imported plates are slightly lower, except for special brands.

Solder.—Low prices for tin and lead have caused an easing off in prices for Solder, which is quoted at 13½ @ 14½¢ for half and half (guaranteed); and 11½¢ @ 12¢ for No. 1.

Chicago Report.

Scrap.—There is still no demand whatever for Old Material, and the following buying prices are therefore only nominal:

	Per net ton.	Per lb
No. 1 Wrought Scrap	$10.00	....
Machinery Cast	7.50	....
Malleable Cast	7.00	....
Stove Plate (free of burnt)	5.00	....
Burnt Iron and Grate Bars	4.00	....
Sheet Iron and Hoops	3.00	....
Plow Steel and Breaking Stock	6.00	....
No. 2, such as Shovels, Hoes, &c	4.50	....
Old Boilers—whole (Iron)	6.00	....
" (Iron)—cut in single Sheets and Rings	9.00	....
Old Gas-Pipe and Boiler Tubes	6.00	....
Cast Borings	3.50	....
Turnings	5.00	....
Horseshoes	10.00	....
Copper Bottoms	....	7 ¢
Copper Clips and Heavy	....	8½¢
Heavy Brass	....	7½¢
Light Brass	....	4 ¢
Pipe Lead	....	3 ¢
Tea Lead	....	2½¢
Zinc	....	2¾¢
Rubber	....	2¾¢

Anthracite.—There is very little movement among either retail dealers or consumers, and shippers think that trade is likely to be dull for some time in sympathy with other branches. They continue to quote carload lots of 12 net tons as follows:

	Grate.	Egg, Sto. and Ch.
Chicago, Ill	$5.85	$6.10
Milwaukee, Wis	5.85	6.10
Kansas City, Mo	9.05	9.30
Council Bluffs, Iowa	9.05	9.30
Lincoln, Neb	9.20	9.45
Sioux City, Iowa	9.05	9.30
Aberdeen, S. Dak	9.10	9.35
Dubuque, Iowa	7.15	7.40
Madison, Wis	7.35	7.60
St. Paul, Minn	8.35	8.60
Burlington, Iowa	7.35	7.60
Des Moines, Iowa	8.80	9.05
Davenport, Iowa	7.15	7.40
St. Joseph, Mo	9.05	9.30
Leavenworth, Kan	9.05	9.30
Omaha, Neb	9.05	9.30

Colorado Anthracite.

COLORADO FUEL & IRON COMPANY.

Denver	$8.00
Pueblo	8.00
Colorado Springs	8.00
Leadville	8.00
Cheyenne, Wyo	10.00
All points between Denver and Missouri River	9.35

THE FIRM OF JOHN MERRY & Co., New York, who are well known to buyers of Sheet Metals, have been succeeded by the firm of Merry & Clark, importers of Tin Plates, Sheet Iron and Metals. Geo. E. Merry, who has for many years been associated with the old firm, needs no introduction to the trade. Elton W. Clark, the other partner, comes from the Wall street center, and, we understand, is a man of considerable ability and experience in foreign and domestic financial matters. It is the intention of the new firm to continue at 535 to 547 West Fifteenth street, New York, where old friends will receive a cordial welcome.

CONDITION OF THE

Hardware Trade.

THE VOLUME OF BUSINESS in all parts of the country continues to be very small, orders being strictly confined to the requirements of dealers. Manufacturers and jobbers are making very little effort to sell goods and are confining their energies to making collections and keeping down expenses. In many instances orders previously given are being reduced or countermanded, and in some cases deliveries deferred. Collections continue difficult, although some houses report an improvement in this respect. Stocks of manufactured goods are not in general large, manufacturers having during the whole of this year pursued a very conservative policy in this respect, and are now reducing their production to prevent any great accumulation of goods. This policy will save the market the danger of being depressed by large stocks of goods which manufacturers might find themselves forced to sacrifice. The improvement in the financial situation during the week has had an encouraging effect upon the business community, and the opinion is very general that the reaction has begun. Among the important factors in this are the exports of produce and securities and the consequent importations of gold. Our exports of hay on account of the scarcity of fodder in Europe promise to be very large, and the prospect of this has led to a great demand for Bale Ties, on which a scarcity is apprehended. The low prices which have prevailed for a long time in manufactured Products seem to remove the danger of any sensational decline in the market.

Advices from Chicago.—Shelf Hardware jobbers report continued dullness which is felt in every line, the demand for Builders' Hardware being far below the average at this time of the year, while staple goods are moving in very light quantities only. Jobbers are receiving reports from manufacturers that they are closing up their establishments to wait for a revival of trade. Purchases being made here for stock are now only about one-quarter of their usual volume. If this rate holds good throughout the country the stock of goods held in the wholesale Hardware trade will soon be down to such a low point that a revival in the demand cannot fail to cause such a rush for orders from all sections as to overwhelm manufacturers with business. The congested condition of the Hardware trade thus appears likely to result at some time in the future in activity fully as pronounced in its way as the present dullness. This is a contingency to be guarded against by those who are able to keep their stock of goods in fair condition. Much is heard now of the generally excellent condition of the farmers, who have had two good years, enabling them to pay off mort-

gages, while all crops are fair this year with a heavy demand from abroad. Collections are growing better, if anything, showing that people are liquidating their indebtedness as fast as possible, thus putting themselves in good financial shape.

Cut Nails.—The majority of mills producing Cut Nails are either closed or running very light. The movement of goods is very small and prices still rule at $1.05 for carload lots at mill, but this price can be shaded for desirable specifications in both Iron and Steel Nails. Small lots from store in New York are quoted at $1.30.

Advices from Chicago.—The demand for Cut-Steel Nails is still confined to small lots only, and the idle factories are offered no encouragement whatever for resuming operations. Prices remain unchanged at $1.20 to $1.25, Chicago, for carload lots from factory, and $1.25 to $1.30 for small lots from stock.

Wire Nails.—The makers of Wire Nails are still endeavoring to make some arrangement among themselves which will restore the business to a profitable basis, and they express a good deal of confidence in the ultimate success of these efforts. In the meantime they have agreed to keep all the mills closed during the month of August. Stocks in makers' hands are light, and in most instances assortments are badly broken. For carload lots at mill $1.35 is the regular price, but sales have recently been made at figures shading $1.30.

Advices from Chicago.—Manufacturers are now having weekly meetings for discussion of ways and means to improve the condition of trade. They were not able last week to arrange matters finally for the perfection of a plan to restrict production, which is under contemplation, but the subject is to be considered at further meetings. It is likely that the factories will be kept closed during the month of August, as stocks have not yet been reduced to a point which makes it necessary to resume operations. Prices are unchanged at $1.45 Chicago, for factory lots and $1.55 to $1.60 for small lots from stock.

Barb Wire.—There is very little doing in this article, but prices remain firm at $2.45 to $2.50 for carload lots of Four-Point Galvanized at mill, and small lots from store at the usual advance.

Advices from Chicago.—Stagnation prevails in this branch of trade. The only movement reported from any part of the country is from the extreme South, where planters and farmers have harvested their crops and are now beginning to purchase Wire to improve their farms. This movement, however, is not of sufficient importance to extend to the factories in this vicinity, which are still closed. Prices can be quoted as before at $2.10 for carload lots of Painted and $2 50 for Galvanized. Jobbers maintain quotations on small lots from stock at $2.30 and $2.70 respectively.

Traveler's Drinking Cup.—T. H. Clifford, 265 Dearborn street, Chicago, is putting this article on the market, a description of which appeared in *The Metal Worker* several weeks ago. The Cup is sold to the trade at $3 per dozen.

Glass.—The condition of the Glass trade is much the same as that of other lines. There is some business being done, in amount of course small compared with that of previous years, and collections are slow. Reports from Western cities indicate a partial cessation of building operations, which condition, to a greater or less extent, is found throughout the entire country. On the other hand, stocks of Glass are not large and prices are as well maintained as they have been for the past six months. The date upon which the factories will resume work is undecided, although September 1 is the usual time for beginning. Prices at which Glass is being sold in Philadelphia, Baltimore and Southern markets are reported as still being somewhat below the rates established by the National Window Glass Company, and it is understood that imported Glass quotations are shaded in some cases. Quotations on Glass remain unchanged, as follows: American Window Glass, less quantities than carloads, 80 and 10 per cent. discount, f.o.b. at shipping point. French Window Glass, 75 and 10 and 5 per cent. discount. American Plate ranges in price from 50 and 10 and 7½ per cent. discount to 60 and 5 per cent. discount. Imported Plate Glass, 60 per cent. discount to 60 and 10 and 5 per cent. discount.

Old Rubber.—Prices are fairly well maintained at present rates, with a minimum amount of business doing. The following are the prices paid for Old Rubber delivered in New York, except as otherwise stated:

Car Springs, ton lots, ℔ lb.		@	$0.03¼
Rubber Shoes, carloads, delivered at factory, ℔ lb.		@	.03⅛
Rubber shoes, less than carloads		@	.03
Large Hose, ℔ ton		@	9.00
White Wringer Rolls, ℔ lb.		@	.04¼
White Wringer Rolls, good grade	04½	@	.05
White Syringes, ℔ lb.		@	.05

Old Rags, Paper, &c.—Business continues practically at a standstill, the demand from Paper mills being very limited. The following are the current prices quoted for Old Rags, Paper, &c., delivered in New York:

No. 1 White Rags	℔ lb 3	@	3⅛¢
No. 2 White Rags	℔ lb 2	@	2⅛¢
Mixed Rags	℔ lb		1¼¢
Blues and 3ds	℔ lb		1¼¢
Hard Sized White Shavings	℔ lb		2¾¢
No.1 White Book Shavings	℔ lb 2¼	@	2⅜¢
No.2 White Book Shavings	℔ lb 1½	@	1¾¢
Light Book Shavings	℔ lb ⅞	@	1¢
No. 1 Mixed Shavings	℔ lb		1¢
No. 2 Mixed Shavings	℔ lb		½¢
No. 1 Printed Books	℔ lb 1	@	1¼¢
Ordinary Mixed Books	℔ lb ½	@	¾¢
Newspapers	℔ lb		½¢
No. 1 Manila Paper	℔ lb 1⅛	@	1¼¢
No. 2 Manila Paper	℔ lb ⅞	@	1 ¢
Bogus Paper	℔ lb ⅝	@	¾¢
Common Paper	℔ lb ⅜	@	½¢
Straw Chips	℔ lb ½	@	⅝¢
Binders' Clippings	℔ lb ½	@	⅝¢
Jute Butts	℔ lb		1⅛¢
No. 1 Jute Bagging	℔ lb 1¼	@	1⅜¢
Mixed Bagging	℔ lb		1¢
No. 2 Bagging	℔ lb		¾¢
Hemp Twine	℔ lb		2¼¢
Manilla Rope	℔ lb		2¼¢
Jute Rope	℔ lb 1½	@	1¾¢
Mixed Rope	℔ lb ¾	@	⅞¢

Old Metals.—There is little business doing in this class of material. Prices depend largely upon pressure to buy or sell. The following are fair quotations now current for Old Metals in New York, subject to the conditions stated:

Heavy Copper	℔ lb	9½¢
Light and Tinned Copper	℔ lb	8½¢
Heavy Brass	℔ lb	7¢
Light Brass	℔ lb	6¢
Lead	℔ lb	3½¢
Tea Lead	℔ lb	3¼¢
Zinc	℔ lb	2¾¢
No. 1 Pewter	℔ lb	14¢
No. 2 Pewter	℔ lb	7¢
Wrought Scrap Iron	℔ gross ton,	$13.00
Heavy Cast Scrap	℔ gross ton,	9.00
Stove Plate Scrap	℔ gross ton,	6.00
Burnt Iron	℔ gross ton,	4.00
Mixed Bagging	℔ lb	1 ¢
No. 2 Bagging	℔ lb	¾¢
Hemp Twine	℔ lb	2½¢
Manila Rope	℔ lb	2¼¢
Jute Rope	℔ lb 1⅛ @	2 ¢
Mixed Rope	℔ lb ¾ @	⅞¢

Trade Notes.

THE NUMBER OF PEOPLE who read the advertising pages before they give their attention to the other part of a publication is by no means so small as is generally imagined, and there is not a little excuse for the preference shown when we consider the tastefulness displayed in the presentation of advertisements now-a-days. A little pamphlet issued by the Huette-Barler Mfg. Company, Chicago, Ill., is a wonderfully neat example of the attractive advertising circular. The outside cover bears the inviting legend "How to shine in home and office" and the inner pages develop this idea. The first is a picture of the old-fashioned method of shining with the foot on a broken box and pretty much of everything daubed with blacking. The second page shows the work done with the assistance of a bootblack; the third illustration show Barler's Shine Cabinet as used in the office; the fourth, the fifth, sixth and seventh as used in the home by the various members of the family for various purposes. This cabinet is a neat little device fastened to the wall.

SIDNEY SHEPARD & Co., Buffalo, N. Y., send out circulars respecting Yager's Soldering Salts, which they adopted at their works some years ago. Their experience with it was so satisfactory that they began to sell it, and now have a large trade in the Salts, supplying tinware factories, packing houses, electric light companies, &c. The Salts are said to be unlike acids, as they emit no fumes or smells.

THE FURNACE & SHEET METAL WORKERS' ASSOCIATION of Rochester, N. Y., had their annual outing at Newport, N. Y., July 26, and indulged in a variety of sports and games.

THE MATAWAN ENAMELED BRICK, as displayed by the J. L. Rue Pottery Company, Matawan, N. J., in the windows of their New York office at 54 East Twenty-third street, are interesting to fire place and grate dealers. They are not only shown in a variety of colors,

but each color is in several tints and several are attractively mottled. These effects are increased by the perfectly smooth surface of the enamel, which is remarkable in being free from craze. To accomplish this end has been the effort of many manufacturers, and the success made in the Matawan Brick is conceded in its adoption by such architects as R. H. Hunt and McKim, Mead & White, who have previously used English brick exclusively.

THE E. W. BLISS COMPANY, Brooklyn, N. Y., issue a very elaborate series of catalogues in connection with their exhibit at the World's Columbian Exposition in Chicago. These publications were put out for the purpose of explaining to foreigners, as well as to English speaking visitors, all the details and particulars of their machinery. The publications of the series are five in number, and among the goods named are the Stiles Drop Hammers, the Stiles Friction Roll Drop Toggle Presses of various kinds and sizes, Adjustable Power Presses, Open Back Power Presses, Central Swing Power Presses, Power Punching Presses, Geared Power Punching Presses, Deep Throat Power Presses and the Double Crank Presses, the latter comprising an extensive line. The special feature of these publications is not so much the neat illustrations and excellent topography, but the parallel accounts published in the three languages, English, French and German. We think this will be particularly appreciated, for among the visitors at Chicago are large numbers of German and French metallurgists and machinists who are more familiar with machinery than they are with the English language, and will appreciate the assistance of a description in their native tongues.

THE ILLINOIS ROOFING & SUPPLY COMPANY, 203 Lake street, Chicago, publish a remarkably strong testimonial in their advertisement in this issue. They are agents for "Gilbertson's Old Method" Roofing Tin, and the testimonial, which is from the Commissioners of South Dakota to the World's Fair, says that the roof of this tin on the South Dakota State Building, after a long and severe trial, has proved itself to be the best roof of any of the buildings on the World's Fair grounds. It is still as perfect as the day it was put on, which was early last October. No paint or varnish of any kind was applied to the surface of the tin, and yet it shows no signs of rust. The Illinois Roofing & Supply Company guarantee that each box of IC 20 x 28 shall weigh 240 pounds net, without the box, covered with 36 pounds of best terne coating, and that each sheet shall be made of softest steel and stamped carefully with the brand and thickness. They further state that no Wasters are sent to the United States, therefore it is only possible to secure the best.

THE MCCULLOCH IRON WORKS at Northeast, Md., which have been shut down for some time, will, it is stated, start up again at an early date. During the shut down two annealing furnaces were installed by Wm. Swindell & Bros., the engineers and contractors of Pittsburgh, and when the works resume operations they will be able to turn out both galvanized and black sheets.

IT WAS STATED a few weeks since that the Joliet Sheet Steel Rolling Mill Company, Joliet, Ill., were preparing to resume operations at their plant. The matter has since been reconsidered by the management and they have decided to allow the works to remain idle for the present. Quite a number of workmen who went to Joliet, expecting employment with this concern, are now without means of support.

DULL TIMES and a tight money market have caused the Guernsey Rolling Mill Company to indefinitely suspend their project to build new sheet mills at Cambridge, Ohio, for which purpose the company were organized.

THE BRITTON ROLLING MILL COMPANY of Cleveland, Ohio, have decided to go ahead with the erection of a number of sheet mills projected last year. It is expected that two additional mills will be ready for operation within a short time, the bed plates, housing and other equipment having been secured some time since and are ready to put in position at any time.

IN ALL PROBABILITY the National Rolling Mills of the National Tube Works Company, McKeesport, Pa., will resume operations during this week. For some years this concern have not signed the Amalgamated Association scale, but have always paid wages called for by that scale, and it is probable that operations will be resumed this year with the same understanding.

THE DETROIT FOUNDRY EQUIPMENT COMPANY, Detroit, Mich., have opened a New York office at 182 Front street, in charge of J. Gilmour.

THE WHITAKER IRON COMPANY, Wheeling, W. Va., are operating their sheet mills and galvanizing shops to full capacity. There is no talk of a shut down and prospects are said to be good for a steady run.

A LARGE NUMBER of men have been laid off at the works of the Peck, Stow & Wilcox Company, Southington, Conn.

UNITED INDURATED FIBER COMPANY of New Jersey had their factory at Lockport, N. Y., destroyed by fire July 28. It was caused by an explosion in one of the bake ovens, resulting in the destruction of all their manufactured goods and stock in process, together with the building and machinery. It is their intention to rebuild at once, but so far as producing anything there it amounts to a total stoppage until a new plant is installed. Their factory at North Gorham, Maine, makes many goods of the same nature, so they are still in a position to partially execute orders, although since reducing the price on this ware in January of the current year, notwithstanding additions to their manufacturing facilities, they had but recently been in a position to execute orders promptly.

THE BRONSON SUPPLY COMPANY, 90 Beekman street, New York, are about to add the product of two or three new factories to their present line for the fall trade. The articles are of a kindred nature to what they now handle. The Bronson Supply Company have a full stock of their Never Break ware on hand, and will thus be in a position at the beginning of the fall season to fill all orders promptly.

THE sheriff of Cook County took possession on July 29 of the manufacturing plant of the Goulds & Caldwell Company, manufacturers of pumps, pipes, hose and belting, and general mill contractors, at 22 and 24 North Canal street, Chicago. The sheriff's act was in pursuance of a confession of judgment in the Circuit Court in favor of the National Bank of America for $20,000.

THE AMERICAN TUBE & IRON COMPANY, the second largest tube and pipe manufacturers in the United States, with plants at Middletown, Pa., and Youngstown, Ohio, have made application for the appointment of receivers.

THE Lorain Brass Works at Elyria, Ohio, have filed a deed of assignment.

WORTHINGTON pumping engines will be used for the water supply of the City of Osaka, Japan.

THE Rome Brass Works have shut down.

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See Standard Lists on Following Pages

CHICAGO, AUGUST 3, 1893.

Tin—

Straits pigs.....22¢

Imported Tin Plates—

Charcoal Plates.—Bright.

Guaranteed Plates command special prices, according to quality.

		Per box.
Calland and Melyn Grade	IC, 10 x 14.....@	$6.75
	IC, 12 x 12.....@	6.75
	IC, 14 x 20.....@	6.75
	IC, 20 x 28.....@	13.50
	IX, 10 x 14.....@	8.75
	IX, 12 x 12.....@	8.75
	IX, 14 x 20.....@	8.75
	IX, 20 x 28.....@	17.50
	DC, 12½ x 17.....@	6.50
	DX, 12½ x 17.....@	8.50
Allaway Grade, IC,	10 x 14.....@	6.50
"	IC, 12 x 12.....@	6.50
"	IC, 14 x 20.....@	6.50
"	IC, 20 x 28.....@	13.00
"	IX, 14 x 20.....@	8.00
"	IX, 20 x 28.....@	16.00

Coke Plates—Bright.

	Per box.
Steel Coke—IC, 10x14.14x20.	$5.85 @$6.00
IC, 14x20.90 ℔	5.60 @ 5.75
IC, 14x20, 100℔	@ 5.85
10 x 20	8.75 @ 9.00
20 x 28	11.70 @12.00
X, 10x14, 14 x 20	@ 7.50
B.V. Grade. IC,10x14, 14x20.	5.85@ 6.00

Charcoal Plates.—Terne.

Guaranteed Plates command special prices, according to quality.

Mansel and Dean Grades.— IC. 14 x 20	@ $5.62½
20 x 28.....@	11.25
IX. 20 x 28.....@	14.25
Worcester Brand and equal.— IC, 14 x 20..	6.12½@ .....
IC, 20 x 28..	12.25 @ .....
IX, 14 x 20..	7.62½@ .....
20 x 28..	15.25 @ .....

American Tin Plates.

Charcoal Plates.—Bright.

Irondale, A. A.—IC, 14 x 20	$7.00
" " IX, 14 x 20	9.00
" " IXX, 14 x 20	11.00
" " IC, 20 x 28	14.00
" " IX, 20 x 28	18.00
" " IXX, 20 x 28	22 00
Florence.— IC, 10 x 14, 12 x 12, 14 x 20..	$6.75
IX, 10 x 14, 12 x 12, 14 x 20..	8.75
Palma.— IC, 10 x 14, 12 x 12, 14 x 20..	$7.50
IX, 10 x 14, 12 x 12, 14 x 20..	9.50

Each extra cross $2.00 and 20 x 28 double these prices.

Brilliant, Tissue Packed, IC, 14 x 20.	$9.25
Royal, extra, IC, 14 x 20	7.25
Merion, IC, 14 x 20	7.00
Almond, IC, 14 x 20	6.50
Mint, IC, 14 x 20	6.25

Coke Plates.—Bright.

Elwood.—IC, 14 x 20	$6.00
" IC, 20 x 28	12.50

Roofing Plates.

Arch (205 ℔), 20 x 28	@$11.75
Palm (205 ℔), 20 x 28	@ 12.25
Crescent, IC, 20 x 28	@ 12.50
Crescent, IX, 20 x 28	@ 15.75
Empire, IC, 20 x 28	@ 12 75
" IX, 20 x 28	@16.00
Hickory, IC, 20 x 28	@ 13.00
" IX, 20 x 28	@16.10
Alaska (heavily coated), IC, 20x28	@$14.50
Alaska IX, 20 x 28	@ 17.75
Special, IC, 20 x 28	@ 15.00
" IX, 20 x 28	@ 18.25
Merchant's Roofing (extra coated), IC, 20 x 28	@$17.75
Merchant's Roofing (extra coated), IX, 20 x 28	@$21.50
Merchant's Old Method, (extra heavily coated), IC, 20 x 28	@$19.75
Merchant's Old Method (extra heavily coated), IX, 20 x 28	@$23.60
Irondale A: IC, 14 x 20	$6.25
IX, 14 x 20	7.75
IC, 20 x 28	12.50
IX, 20 x 28	15.50
Westmoreland: IC, 14 x 20	$6.25
IC, 20 x 28	12.50
Elwood: IC, 20 x 28	$12.00
Juno: IC, 14 x 20	$5.75
IC, 20 x 28	11.50
Scott's Extra Coated, Stamped and Resquared, IC, 14 x 20	$9.50
Scott's Extra Coated, Stamped and Resquared, IX, 14 x 20	11.00
Scott's Extra Coated, Stamped and Resquared, IC, 20 x 28	19.00
Scott's Extra Coated, Stamped and Resquared, IX, 20 x 28	22.00
Neville, Stamped, IC, 14 x 20	6.25
" " IX, 14 x 20	7.50
" " IC, 20 x 28	12.50
" " IX, 20 x 28	15.00
Taylor's Old Style, IC, 14 x 20 (Stamped and Resquared)	$9.50
Taylor's Old Style, IC, 20 x 28 (Stamped and Resquared)	19.00
Taylor's Roofing, IC, 14 x 20 (Stamped and Resquared)	8.25
Taylor's Roofing, IC, 20 x 28 (Stamped and Resquared)	16.50
Columbia, IC, 14 x 20 (Stamped)	7.25
" IC, 20 x 28 (Stamped)	14.50
Maple, IC, 14 x 20 (Stamped)	6.75
" IC, 20 x 28 (Stamped)	13.50
Willow, IC, 14 x 20	6.50
" IC, 20 x 28	13.00
Knoxall, IC, 14 x 20	6.25
" IC, 20 x 28	12.50
Globe, IC, 14 x 20	6.00
" IC, 20 x 28	12.00
Miami, IC, 14 x 20	6.00
" IC, 20 x 28	12.00
" IX, 20 x 28	15.00
" (Redipped), IC, 20 x 28	17.00

Tin Boiler Plates.

	Per box of 100 sheets.	Per box of 112 sheets.
X, 14 x 28	$13.00	$13.00
XX, 14 x 28	14.50	14.50
X, 14 x 31	14.50	15.80
XX, 14 x 31	16.50	17.50
X, 14 x 56	29.50	16.50
XX, 14 x 56	32.50	18.20
X, 14 x 60	31.50	17.65
XX, 14 x 60	35.50	20.90

Sheet Iron—

Black.

Nos.	Common American	Refined.
10 to 16	℔ 2 7-10¢	3 3-10¢
17 to 20	℔ 2 8-10¢	3 4-10¢
21 to 24	℔ 2 9-10¢	3½¢
25 and 26	℔ 3¢	3 6-10¢
27	℔ 3 1-10¢	3 7-10¢

Russia, Planished, &c.

Genuine Russia, all numbers....13¢ net.
Patent Planished....℔ A, 10¼¢; B, 9¼¢ dis. 5%

Galvanized.

List on following page.
Juniata or first quality.....dis. 70&5%

Copper—

Ingot.

Lake.....11¾¢ @ 12¼¢
Casting Brands.....11¢ @ 11½¢

Sheet and Bolt.

List on following page. Discount to retailers, 25%.

Copper Bottoms.

List on following page. 25%.

Seamless Brass and Copper Tubes.

Base price, 17½¢, Chicago, with extras according to size.
Copper, Bronze and Gilding Tube, 3¢ ℔ additional.

Brazed Brass Tubing.

(To No. 20 inclusive.)

Add freight from New York to Chicago to these prices, or 50¢ ℔ 100 ℔.

Above 5-16 inch to 3 inch inclu	35¢
Plain, above 3 inch	45¢
Plain, 5-16 inch	45¢
Plain, ¼ inch	60¢
Plain, 3-16 inch	$1.00
Plain, ⅛ inch	$1.50
Fancy Tubing, Brass, to No. 20 incl	43¢ ℔
Bronze Tubing, 3¢ ℔ more than Brass	

35 @ 40 %

Roll and Sheet Brass.

List on following pages. 35 @ 40%.

Slab Spelter—

Western Spelter.....5

Sheet Zinc—

600 ℔ casks.....6¼¢
Less than Casks, ℔ ℔.....6½¢

Lead—

Soft Pig Lead.....4.60¢@5¢
Bar.....5½¢, dis. 10¢
Pipe.....
Block Tin Pipe.....33¢
Sheet.....6¢, dis. 10%

Solder—

½&½.....13¼¢@13¾¢
Extra Wiping.....12¢

The prices of the many other qualities of Solder in the market indicated by private brands vary according to composition.

Antimony—

Cookson.....12½¢@13½¢
Hallett's.....11½¢@12½¢

Wire—See *Hardware.*

Wrought-Iron Pipe—

List on following page.

1¼ and under, Plain	57½&10%
1¼ and under, Galv	52½&10%
1½ and over, Plain	67½&10%
1½ and over, Galv	60&10%
Boiler Tubes, list Oct. 24, 1892	65@67½%
Casing, list Nov. 16, 1892	52½%
Inserted Joints Casing, list Nov. 16, 1892	47½%
Steel Boiler Tubes	27½%
Cold Drawn Seamless Steel Tubing	60%

Cast-Iron Soil Pipe—

Cast-Iron Soil-Pipe, Tarred; sizes 2 to 6 inches, inclusive	dis 70&2½%
Other sizes	dis 60%

Leader Pipes—

Abendroth's Galv. Spiral Riveted	60%
Austin's Corrugated	60%
Gordon & Gilbert's Corrugated	60%
Ritchie's (Galv. Iron only) Cor'd	60%
Ritchie's Spiral Lock Seam, Galv'd	55%
Austin's Spiral Ribbed Pipe	60%
Plain Adjustable Elbows	60%
James A. Miller Bros. (Galv'd Iron only) Corrugated	60%

Furnace Fittings—

Discount from Excelsior Steel Furnace Co.'s list.....50%

Steel Roofing—

Perfection	$3.75 square
Climax	$3.50 square
The Lloyd Spanish Tiling	$4.50 square

Metallic Shingles—

Cushman's	$1.25 square
Merchant & Co.'s Spanish Tiles: Copper, 14 oz	$36.00 square
Steel, painted	$9.00 square

Drain Pipe—

Discount from list.....50%

Paints, Oils, &c.—

Deodorized Benzine	7½@8 ¢
Iron Paint, Bright Red	℔ ℔, 2 ¢
" " Brown	℔ ℔, 1½¢
" " Purple	℔ ℔, 2½¢
" Ground in oil, B. Red	℔ ℔, 6½¢
" Ground in oil, Red	℔ ℔, 6½¢
" Ground in oil, Brown	℔ ℔, 5½¢
" Ground in oil, Purple	℔ ℔, 6 ¢
Linseed Oil, Boiled, in bbls	53¢
Linseed Oil, Raw, in bbls	50¢
Mineral Paints	2@4¢
Orange Mineral	10¾¢
Pure White Lead in Oil	6¾@7¼¢
Dry White Lead in bbls	6¾@6¾¢
Red Lead, American	7@7½¢
Red Venetian, English, dry	$1.65@$1.70
Red Venetian in oil; asst'd cans, 8½¢ kegs	7½¢
Sipe's Japan Oil, in bbls, ℔ gal	32¢
Spirits Turpentine, in bbls., ℔ gal.	32½¢
Asphaltum, Trinidad Refined, ℔ ton	$45
Tarred Felt, 1 Ply, ℔ 100 ℔	$1.65
Tarred Felt, 2 Ply, ℔ roll 108 sq. feet	$1.50
Tarred Felt, 3 Ply, ℔ roll of 108 sq. feet	$2.00
Roofing Pitch, ℔ bbl. of 300 ℔	$3.20

NEW YORK, AUGUST 4, 1893.

Aluminum—

No. 2 Grade Metal, in ton lots..℔ ℔, $0.75
No 1 (guaranteed to be 98 % pure and over), in ton lots .....℔ ℔ .90
Lots less than 1 ton, 10¢ ℔ ℔ additional.

Antimony—

Cookson .....℔ ℔, 11¢
Hallett's.....℔ ℔, 10½¢

Brass—

Planished.....net
Roll and Sheet.....35@40%

Brass and Copper Tubes

Brazed Brass Tubing—

List May 20, 1889.

	Per ℔.
Plain, to No. 20 inclusive, above 5-16 inch to 3 inch inclusive	$0.35
Plain, to No. 20, above 3 inch	45
Plain, 5-16 inch to No. 20	45
Plain, ¼ inch	60
Plain, 3-16 inch	1.00
Plain, ⅛ inch	1.50
Fancy Tubing to No. 20, inclu	43

35@40%

Copper and Bronze Tubing—

3¢ ℔ ℔ more than brass.

Bronze, Tobin—

Drawn Rods for Bolts, Forgings, &c

Over ¼ to 3½ inches inclusive....17¢ ℔ ℔
Over 3½ to 5 inches inclusive.....18¢ ℔ ℔

Piston Rods, Finished True, Smooth and Straight.

Over ¼ to 3½ inches inclusive....18¢ ℔ ℔
Over 3½ to 5 inches inclusive.....19¢ ℔ ℔

Clips—

Buffalo Damper: Nos. 1, $1.25; 2, $2.50 per doz.....40&10%

Conductors—

Corrugated. *Round or Square—*

Galvanized.....60%
Galvanized, Locked Joints.....60%
Tin.....60%

Spiral Riveted—

Galvanized.....50%

See also *Elbows and Shoes; Eave-Trough Miters; Strainers, Conductor.*

Conductor Strainers—See *Strainers, Conductor.*

Copper—

Bottoms, Pits and Flats.....20@25%

Ingot.

Lake.....11½¢
Ansonia Grade Arizona.....11¢
Ansonia Grade Casting.....10¾¢
Planished.....net
Sheet and Bolt.....20@25%

Tubes—See *Seamless Brass Tubes.*

Coppers, Soldering—

See *Irons, Soldering*, in Current Hardware Prices.

Damper Clips Buffalo—

See Clips, Buffalo Damper.

Eave Troughs—

Lap or Slip Joint, Galvanized.....60&5%
Lap or Slip Joint, Terne.....60%

Eave-Trough Mitres—

Lap or Slip Joint.....list, net

Elbows—

Plain Adjustable—

Tin.....70%
Galvanized.....70%

Crimped Tubing—

Re-Tinned or Galvanized.....35%

Stove-Pipe—

Buffalo Four-Piece.

4½	5	5½	6	7 inch,
$0.78	.87	.90	.99	1.20 per doz.

..20 %

Elbows and Shoes—

Flat Crimp.

Tin.....35%
Galvanized.....35%

Corrugated.

Flat Crimp.

Galvanized.....60%

Round or Square.

Tin.....60%
Galvanized.....60%

Iron, Sheet—

Black.

Nos.	Common American.	R. G. Cleaned American.
10 to 16	℔ ℔, 2¾@	3¼¢
17 to 20	℔ ℔, 3 @	3¼¢
21 to 24	℔ ℔, 3¼@	3⅜¢
25 and 26	℔ ℔, 3⅜@	3½¢
27	℔ ℔, 3⅜@	3¾¢
28	℔ ℔, 3⅝@	3¾¢
American B. B.	℔ ℔, 4¢@4¼¢	

Russia, Planished, &c.

Genuine Russia, according to assortment.....℔ ℔, 11¾@12½¢
Patent Planished....℔ ℔, A, 10¢; B, 9¢, 5%
Craig Polished Sheet.....℔ ℔, 8½¢

Galvanized.

Nos.	B. B.
10 to 16	℔ ℔, 4¢
17 to 22	℔ ℔, 4¼¢
23 to 24	℔ ℔, 4½¢
25 to 26	℔ ℔, 4¾¢
27	℔ ℔, 5¢
28	℔ ℔, 5¼¢
29 and 30	℔ ℔, 6¼¢

Filter Joints—

Lee's.....33⅓ %

Lead—

American Pig.....4¢
Bar.....4¼¢

New York Prices.

Pipe.....6¼¢, 20%
Tin Lined Pipe.....16¢, 20%
Block Tin Pipe.....37½¢, 20%
Sheet.....7¢, 20%
Old Lead in exchange, 3¼¢ ℔ ℔.

Pittsburgh Prices.

Lead Pipe in whole coils.℔ ℔, .05¢, 10&5%
Sheet Lead in whole coils.℔ ℔, .05½¢, 10&5%

Metal, Expanded—

Manufacturers' list No. 5.

Lathing	10%
Fencing, Painted Sheets	20%
Netting, Painted Sheets	20%
Door Mats, Galvanized	25%
Window Guards, Paneled	15%
Tree Guards, Paneled	15%

Mitres Eave-Trough—See *Eave-Trough Mitres.*

Paints Oils &c.—

Lead, Ann. White, Dry or in oil: Kegs, lots less than 500 ℔	7 @ 7¼
Kegs, lots 500 ℔ to 5 tons	6¾ @ 6¾
Kegs, lots 5 tons to 12 tons	6¾ @ 6⅞
Kegs, lots 12 tons and over	6¾ @ 6¾
Lead, White, in oil, 25 ℔ tin pails, add to keg price.	@ ⅛

Lead, White, in oil, 12½ ℔ tin pails, add to keg price..... ... @ 1
Lead, Red, bbls. and ½ bbls... 6 @ 7
Lead, Red, kegs ... . 6¼ @ 7¾
Ocher, American ..... ⅛ @ 1¾
Red, Venetian, American..... ₱ 100 ℔..1.00 @ 1.10

Linseed Oil:
City, raw, ₱ gal..... .. @ .50
City, boiled..... .. @ .53
Western, raw..... .. @ .50

Spirits Turpentine:
In regular bbls.....28½ @ . 29
In machine bbls..... .. .... 29 @ .29¾

Putty:
In barrels and ½ bbls..... .01⅜ @ .01¾
In tubs..... .01⅝ @ .01¾
In tin cans .... .01½ @ .02¼
In bladders . .... .01⅞ @ .02¼

Roofing Material, &c.:
Asphaltum, Trinidad Refined, ₱ ton. .. ....$30.00@$35.00
Asphaltum, Rock, ₱ ton.....$14.00
Coal Tar Felt, 1 Ply, ₱ ℔.....2¢
Coal Tar Felt, 2 Ply, ₱ roll 108 sq. ft. $1.42½
Coal Tar Felt, 3 Ply, ₱ roll 108 sq. ft. $1.85
Roofing Pitch, ₱ bbl.....$2.25

Pipe, Drain 50%

Pipe and Fittings, Cast Iron Soil—

Cast-Iron Soil Pipe, Tarred, sizes 2 to 6 Inches, inclusive.....60@60&10%
Other sizes.....55@55&10%
Cast-Iron Fittings, Tarred, sizes 2 to 6 inches ... .60@60&10%
Other sizes.....55@55&10%

Pipe, Spiral—

Galvanized.....60%
Tin.....60%

Pipe, Wrought Iron

For discounts see Current Hardware Prices.

Polish, Stove—

See Current Hardware Prices.

Rivets and Burrs—

For discounts see Current Hardware Prices.

Rock and Slag Wool—

	₱ ℔	₱ cub. foot.
Slag Wool, ordinary	1¼	19¢
Slag Wool, extra.	4½	38½¢
Rock Wool, ordinary	2¼	27¢
Rock Wool, extra.	7¼	43½¢

Rosin—

Common and Good—Strained,
Rosin, C. & D.....₱ bbl. $1.09@$1.10
Rosin, E. & F.....₱ bbl. $1.15@$1.40
Rosin, G. & H.....₱ bbl. $1.55@$1.90
Rosin, I. & K.....₱ bbl. $2.00@$2.85
Rosin, M. & N.....₱ bbl $3.10@$4.00

Seamless Brass Tubes..net

Shoes and Elbows—See *Elbows and Shoes.*

Slate Roofing—

According to size, f.o.b. cars, Quarry Station.

Pennsylvania:
Best Bangor, ₱ sqr.....$3.25@$4.50
Pen Argyle, ₱ sqr.....3.50@ 4.25
Peach Bottom, ₱ sqr..... 5.00@ 6.25
No. 1 Chapman, ₱ sqr..... 4.00@ 4.65
Lehigh Slates, ₱ sqr .... 3.00@ 4.50
Vermont:
Sea Green, ₱ sqr..... 2.70@ 3.20
Purple, ₱ sqr ..... 3.50@ 4.50
Unfading Green, ₱ sqr..... 3.50@ 4.00
Red, ₱ sqr ..... 9.75@12.00

Solder and Soldering Fluids—

Solder—

½ & ⅓ (Guaranteed)..... 13½@14½¢
No. 1..... 11¾@12 ¢
Prices of Solder indicated by private brands vary according to composition.

Soldering Fluids—

Concentrated Soldering Flux.
f.o.b. New York.
In barrels, ₱ ℔ ....4¢
Smaller quantities, ₱ ℔.....5¢

Gedney's Soldering Fluid.
In carboys or barrels, ₱ ℔.....2¢
$1.50 for carboy or barrel; money refunded when returned.

Perfection Soldering Flux.
No charge for package.
3lbs., about 500 ℔, ₱ ℔.....3½¢
½ bbls., about 300 ℔, ₱ ℔.....3¢
Kegs, about 110 ℔, ₱ ℔.....4¢
75¢ extra for keg. } 5% dis.
Kegs, about 55 ℔, ₱ ℔.....4¢

Yager's Soldering Salts.
½ ℔ bottles, each.....30¢
Large quantities, per ℔.....40¢

Spelter—

Western Spelter..... .....4¾¢@5¢
Bertha..... .....8¢

Spiral Pipe—See *Pipe, Spiral.*

Stove-Pipe Elbows—*See Elbows, Stove Pipe.*

Stove Polish—See *Polish, Stove.*

Stove Trucks—See *Trucks, Stove.*

Strainers Conductor—

Galvanized.....60%

Tin, Pigs and Bars—

Banca, pigs, ₱ ℔..... .....21½¢
Straits, pigs, ₱ ℔..... .....21¢
Straits in bars, ₱ ℔.....22¢

Tin Plates—

American Terne Plates—

Apollo Roofing.
IC, 14 x 20.....$6.25
IC, 20 x 28..... .....12.50
IX, 14 x 20..... .....7.25
IX, 20 x 28..... .....14.50

Buckeye.
IC, 14 x 20.....$7.00
IC, 20 x 28..... .....14.00
IX, 14 x 20..... .....8.25
IX, 20 x 28.... .....16.50
IXX, 14 x 20..... .....9.50
IXX, 20 x 28..... .....19.00

Continental Tin Plate Works.

	14 x 20	20 x 28
IC Terne, Pennsyl Old Method, Treble Coated	$8.50	$16.75
IC Terne, Leominster, Extra coated	7.75	15.00
IC Terne, Waldo, Redipped	7.25	14.00
IC Terne, Alderly, Extra quality	6.37½	12.50
IC Terne, Phoenix	5.80	11.50
IC " Climax	5.70	11.25
IC " Venux	5.60	11.00
IC " Flag	5.50	10.50

De Mill's.
First New York, IC, 14 x 20.....$5.75
" " " IC, 20 x 28 ... .. 11.50
First New Jersey, IC, 14 x 20..... 5.75
" " " IC, 20 x 28..... ...11.50
Manhattan, IC, 14 x 20 ..... 7.25
" IC, 20 x 28 ... . ..14.50

Dunlap's.
Double Dipped, IC, 14 x 20.....$8.25
" " IC, 20 x 28 .....16.50
" " IX, 14 x 20 ..... 9.50
" " IX, 20 x 28.....19.00
Domestic, IC, 20 x 28 ....12.00
" IX, 20 x 28.....15.00

Glendale Tin Plate Co.
Optimus, Best Redipped, IC, 14 x 20.$8.25
" " " IC, 20 x 28.16.50
" " " IX, 14 x 20. 9.75
" " " IX, 20 x 28.19.50
N. F., Old Style, IC, 14 x 20..... 7.50
" " " IC, 20 x 28 ... ... 15.00
" " " IX, 14 x 20 ..... 9.00
" " " IX, 20 x 28.... 18.00
Bonus, Extra Coated, IC, 14 x 20... 6.75
" " " IX. 14 x 20... 8.25
" " " IC, 20 x 28...13.50
" " " IX, 20 x 28...16.50

Hamilton's.
Hamilton's Best Redip'd, IC, 14x20 $9.25
" " " IC, 20x28 18.50
" " " IX, 14x20 10.75
" " " IX. 20x28 21.50
Osceola Hand Coated, IC, 14x20 8.25
" " " IC, 20x28 16.50
" " " IX, 14x20 9.75
" " " IX, 20x28 19.50
Lula Best Charcoal, IC, 20x28 12.50
" " " IX. 20x28 16.00

Laufman's.
Apollo, IC (Resquared), 14 x 20.....$8.12
Apollo, IX (Resquared), 14 x 20..... 9.37
Apollo, IC (Resquared), 20 x 28.....16.00
Apollo, IX (Resquared), 20 x 28.....18.50
Apollo, IC (Resquared), 20 x 56.....16.00
Apollo, IX (Resquared), 20 x 56.....18.50
Tip Top, IC (Resquared), 14 x 20.... 6.62
Tip Top, IX (Resquared), 14 x 20.... 7.88
Tip Top, IC (Resquared), 20 x 28....13.00
Tip Top, IX (Resquared), 20 x 28....15.50
Allegheny, IC, 14 x 20..... 6.12
Allegheny, IX, 14 x 20..... 6.38
Allegheny, IC, 20 x 28.....12.00
Allegheny, IX, 20 x 28.....12.50

McKinley Tin Plate Co.
McKinley:
IC, 20 x 28 . ... $12.00
IX, 20 x 28 . ....15.00
Fort Pitt.
IC, 20 x 28 .....$11.00
Chicago:
I , 20 x 28 .....11.50
Wilkinsburg Redipped:
IC, 20 x 28.....$16.00
IX, 20 x 28 .....19.00

Merchant's.—All Stamped.
Crescent, IC, 20 x 28.....$12.00
Crescent, IC, 14 x 20..... 6.00
Hickory, IC, 20 x 28 (Resquared).. 12.75
Hickory, IC, 14 x 20 (Resquared)...6.37½
Empire, IC, 20 x 28..... 12.25
Empire, IC, 14 x 20.....6.12½
Alaska, IC, 20 x 28 (Resquared).... 14.00
Alaska, IC, 14 x 20 (Resquared).... 7.00
Merchant's Roofing, IC, 20 x 28 (Resquared)..... 17.00
Merchant's Roofing, IC, 14 x 20 (Resquared)..... 8.50
Merchant's Old Method, IC, 20 x 28 Resquared)..... 19.00
Merchant's Old Method, IC, 14 x 20 (Resquared 9.50

Pittsburgh Tin-Plate Works.
Kensington:
IC, 14 x 20 ... . $6.75
IC, 20 x 28..... 13.50
IX, 14 x 20..... 8.00
IX, 20 x 28 ..... 16.00
Westmoreland:
IC, 14 x 20 ..... $6.25
IC, 20 x 28..... ..... 12.50
Juno:
IC, 14 x 20..... $5.75
IC, 20 x 28 .... 11.50

Scott's.—All Stamped.
Scott's Extra Coated, IC, 14 x 20 (Resquared) $9.25
Scott's Extra Coated, IX, 14 x 20 (Resquared)..... 10.75
Scott's Extra Coated, IC, 20 x 28 (Resquared)..... 18.50
Scott's Extra Coated, IX, 20 x 28 (Resquared)..... 21.50
Neville, IC, 14 x 20 .... 6.00
" IX, 14 x 20..... 7.25
" IC, 20 x 28..... .. ..12.00
" IX, 20 x 28 .....14.00

N. & G. Taylor Co.'s.
Taylor, Old Style, IC, 14 x 20 (Stamped and Resquared)..... $9.25
Taylor Old Style, IC, 20 x 28 (Stamped and Resquared)..... 18.50
Taylor Roofing, IC, 14 x 20 (Stamped and Resquared)..... 8.00
Taylor Roofing, IC, 20 x 28 (Stamped and Resquared)..... 16.00
Columbia, IC, 14 x 20 (Stamped)... 7.00
Columbia, IC, 20 x 28 (Stamped)... 14.00
Maple, IC, 14 x 20 (Stamped)..... 6.50
Maple, IC, 20 x 28 (Stamped)..... 13.00
Willow, IC, 14 x 20..... 6.25
Willow, IC, 20 x 28..... 12.50
Knoxall, IC, 14 x 20 ..... 6.00
" IC, 20 x 28..... ..... 12.00
Globe, IC, 14 x 20..... 5.75
Globe, IC, 20 x 28..... 11.50

A. A. Thompson & Co.'s.
Old Colony, IC, 14 x 20.....$8.00
" " IC, 20 x 28..... .....16.00
Thompson's Puritan, IC, 14 x 20.....5.75
" " IC, 20 x 28....11.50
Durham, IC, 14 x 20.....5.75
" IC, 20 x 28.....11.50
Central, IC, 14 x 20..... ..... 5.4.5
" IC, 20 x 28.....10.75
" WC, 14 x 20..... ..... 5.25
" WC, 20 x 28.....10.25
Tarn, IC, 20 x 28.....10.50

U. S. Brands.—All Stamped.
U. S. Monongahela, IC, 14 x 20.....$6.50
U. S. Redipped, IC, 14 x 20..... 9.25
20 x 28 double the price of 14 x 20

American Bright Plates—

Continental Tin Plate Works.
" Phoenix" extra. Climax

IC, 14 x 20, Bright	$6.50	$6.25
IX, " "	8.00	7.75

All sizes and thicknesses, etc.

Merchant's.
Merchant's Dipped, IC, 14x20.....$11.00
Palma Xtra, IC, 1 x20.....7.25
Florence, IC, 14x20.....6.75

N. & G. Taylor Co.'s.
Brilliant, Tissue Packed, IC, 14x20..$9.00
Royal, extra, IC, 14x20.....7.00
Merlon, IC, 14x20.....6.75
Linden, IC, 14x20.....6.50
Aimond, IC, 14x20.....6.25
Mint, IC, 14x20.... ....6.00

U. S.
IC, 14x20.....$7.25
IC, 20x28.....14.50

Imported Terne Plates—

Charcoal.
Dean Grade.—IC, 14 x 20.....@$5.50
20 x 28.....₱11.00
IX, 14 x 20.....@ 6.75
20 x 28.....@13.50
Abercarne Grade.—IC, 14 x 20.....@ 5.40
20 x 28.....@10.80
IX, 14 x 20...@ 6.62½
20 x 28.....@13.25

Imported Bright Plates—

Charcoal.
Duty: 2.2¢ ₱ ℔.
Melyn and Caland Grade. IC, 10 x 14.....@$6.50
" " IC, 12 x 12.....@ 6.75
" " IC, 14 x 20.....@ 6.50
" " IC, 20 x 28.....@13.00
" " IX, 10 x 14.....@ 8.50
" " IX, 12 x 12.....@ 8.75
" " IX, 14 x 20.....@ 8.50
" " IX, 20 x 28.....@17.00
" " DC, 12½ x 17.....@ 6.00
" " DX, 12½ x 17.....@ 8.00
Allaway Grade. IC, 10 x 14.....@ 6.00
" " IC, 12 x 12.....@ 6.25
" " IC, 14 x 20.....@ 6.00
" " IC, 20 x 28.....@12.00
" " IX, 10 x 14.....@ 7.50
" " IX, 12 x 12.....@ 7.75
" " IX, 14 x 20.....@ 7.50
" " IX, 20 x 28.....@15.00
" " DC, 12½ x 17.....@ 5.50
" " DX, 12½ x 17.....@ 7.00

Coke.
Steel Coke.—IC, 10x14, 14x20.$5.40@$5.50
10x20.....@ 8.50
20x28.11.50@12.00
IX, 10x14, 14x20.....@ 6.75
B. V. Grade.—IC, 10x14, 14x20....@ 5.50

Imported Boiler Plates—

IXX, 14x26..(112 sheets)..... ..@$13.35
IXX, 14x28..(112 sheets)..... ..@ 14.50
IXX, 14x31..(112 sheets)..... ..@ 16 00

Tinning—

Brass and Copper.....net

Tubing—

Tin.....55%
Galvanized.....55%

Troughs, Eave—See *Eave Troughs.*

Trucks Stove—

Improved Lock Frame, per doz....$15.00
Steel Lock Frame, per doz..... 18.00

Iron Wire—

See *Hardware Prices.*

Brass and Copper.—

Standard List.....30@35%

Zinc—

600 ℔ casks..... 6½¢
Per ℔.....7¢

Price-Lists, Circulars, &c.

UNIVERSAL SAD IRON COMPANY, Milwaukee, Wis.: The Universal Sad Iron. Small sheets in the shape of the Universal Sad Iron, held together by an eyelet, the outside sheets having colored illustrations of the article, are sent out with the compliments of the company. Description, list prices and other information are contained within the covers in a compact and comprehensive manner.

THE PLUME & ATWOOD MFG. COMPANY, New York and Chicago: Royal Lamps, Brass and Copper Goods. The catalogue devoted to Lamps is an artistic production of convenient size, and illustrates Royal Lamps in a variety of kinds and styles. The catalogue referring to Brass Goods gives price-lists of Brass in various forms, Brass and Copper Wire, Copper Rivets and Burs, Brass Butts, Chain, Ferrules, Curtain Rings, Heel Plates, Box Rings, Bells, Drawer Pulls, Banner Lamps, &c.

ODELL HARDWARE COMPANY, Greensboro, N. C.: Illustrated pamphlet No. 8, of 84 pages, devoted to Farming and General Store Goods, including Plows, Barrows, Road Scrapers, Cultivators, Hoes, Steel Fencing, Shovels, Spades, Rakes, Chains, Refrigerators, Wire Goods, Screens, Lawn Mowers, Pumps, Freezers, Cider Mills, Wringers, Hammocks, Milk Shakes, Ice Shaves, Fly Traps, Lawn Sprinklers, Barb Wire, &c. A general Hardware list is issued in addition to this.

A. F. SHAPLEIGH HARDWARE COMPANY, St. Louis, Mo: Fall Catalogue of Seasonable and Holiday Goods. The book contains 56 pages and illustrates Axes, Saws, Scoops, Corn Shellers, Family Grist Mills, Huskers, Pearl Agate Ware, Puritan Ware, Hollow Ware, Meat Cutters, Stove Boards, Shovels, Tongs and Pokers, Coal Vases, Dampers, Electric Bell Sets, Registers, Skates, Sleigh Bells, Sleds, Bicycles, Clocks, &c.

E. F. REECE, Greenfield, Mass.: Screw Cutting Tools. The Reece Improved Hand Bolt Cutters or Screw Plates are illustrated with descriptions and prices in a catalogue. These, with interchangeable tap and die holders for Bit-Brace, &c., are designed for blacksmiths' and machinists' use. Stock, Tap Wrench, and Tap and Dies are put up in sets in cases, of a variety of sizes, adapted for various kinds of work.

A tariff war has commenced between Germany and Russia. The latter country is about to add 50 per cent on to her maximum tariff on German imports in reprisal of similar action on Germany's part in the matter of Russian goods. The opportunity should be a good one to market the agricultural productions of the United States in Germany.

Current Hardware Prices.

AUGUST 4, 1893.

Note.—The quotations given below represent the Current Hardware Prices which prevail in the market at large. They are not given as manufacturers' prices, and manufacturers should not be held responsible for them. In cases where goods are quoted at lower figures than the manufacturers name, it is not stated that the manufacturers are selling at the prices quoted, but simply that the goods are being sold, perhaps by the manufacturers, perhaps by the jobbers at the figures named.

The character @ is used to indicate a range of price; thus discount 50&10@50&10&5 % signifies that the goods in question are sold at prices ranging from discount 50 and 10 % to discount 50 and 10 and 5 %.

Adjusters, Blind—

Domestic.....₩ doz $3.00, 33⅓&5%
Excelsior....₩ doz $10.00.....50&10&2%
North's.....list net @ 10%
Zimmerman's—See Fasteners Blind.

Ammunition—See *Caps, Cartridges, Shells, &c.*

Anvils—

Eagle Anvils, ₩ ℔ 9¢.....15@15&5%
Peter Wright's.....11@11½%
Armitage's Mouse Hole.....10½@11¢
Am. Wrought, Horse shoe brand.11@11½¢
Trenton.....10@10½¢
Wilkinson's.....10½@11¢
Moore & Barnes Mfg. Co.....33⅓&5

Anvil Vise and Drill—

Millers Falls Co., $18.00.....20%
Cheney Anvil and Vise.....25%
Allen Anvil and Vise $3.00.....40&10%
Star.....45&5%

Apple Parers—See *Parers, Apple, &c.*

Augers and Bits—

Common Augers and Bits.....70@70&10%
Boring Machine Augers.....70@70&10%
Car Bits, 12-in. twist.....50%
Russell Jennings' Augers and Bits.25&10%
Jennings' Pattern Car Bits.....40%
Jennings' Pattern Auger Bits.....60%
Snell's Bits.....60&5%
C. E. Jennings & Co., No. 10, extension lip.....40%
C. E. Jennings & Co., No. 30.....60%
C. E Jennings & Co., Auger Bits, ₩ set, 32½ quarters, No. 5, $5; No. 30, $3.50.25%
Lewis' Patent Single twist.....45%
Pugh's Black.....20%
Pugh's Jennings Pattern.....30%
L'Hommedieu Car Bits.....15&10%
Forstner Pat. Auger Bits.....15%
Cincinnati Bell-Hangers' Bits.....30&10

Bit Stock Drills—

Morse Twist Drills.....50&10&5%
Standard.....50&10&5%
Cleveland.....50&10&5%
Syracuse, for metal.....50&10%
Syracuse, for wood (wood list).30@30&5%
Cincinnati, for wood.....30&10%
Cincinnati, for metal.....45&10%

Expansive Bits—

Clark's small, $18; large, $26..35@35&10%
Ives' No. 4, ₩ doz. $60.....40%
Swan's.....40%
Steer's, No. 1, $26; No. 2, $18.....35@40%
Stearns' No. 2, $48.....20%

Gimlet Bits—

Common.....₩ gross $2.75@$3.25
Diamond.....₩ doz $1.25....40&10%
Bee.....25@25&5%
Double Cut, Shepardson's.....45@45&10%
Double Cut, Ct. Valley Mfg. Co....30&10%
Double Cut, Hartwell's.....
₩ gro.,$10.00..40&10%
Double Cut, Douglass'.....40&10%
Double Cut, Ives.....60@60&10%

Hollow Augers—

Ives', French, Swift & Co.(Beecher), Douglass'} 33⅓&33⅓& &10%
Bonney's Adjustable, ₩ doz $48.....50%
Stearns'.....20&10%
Ives' Expansive, each $4.50.....50&5%
Universal Expansive, each $4.50.....20%
Wood's.....25@25&10%
Cincinnati Adjustable.....25&10%
Cincinnati Standard.....25&10%

Ship Augers and Bits—

L'Hommedieu's.....15&10@15&10&5%
Watrous'.....25@25&10%
Snell's.....25@25&10%
Snell's Ship Auger Patt'n Car Bits, 15&10@15&10&5%

Awl Hafts—See *Hafts, Awl.*

Awls—

Awls, Sewing, Common....₩ gr. 85¢@90¢
Awls, Should. Peg.....₩ gr. $1.50@$1.55
Awls, Pat. Peg.....₩ gr. 35¢@38¢
Awls, Shouldered Brad..₩ gr. $1.30@ 1.40
Awls, Handled Brad....₩ gr. $2.50@$3.00
Awls, Handled Scratch..₩ gr. $4.00@4.50
Awls, Socket Scratch..₩ doz. $1.10@$1.20

Awl and Tool Sets—See *Sets, Awl and Tool.*

Axes—

	Plain.	Beveled.
First quality, best brands.	$7.00	$7.50
First qual., other brands	6.50 to 6.75	7.00
Second quality	5.50	6.00

Axle Grease—See *Grease, Axle.*

Axles—

No. 1....3¾¢@4¼¢, No. 2, 5¢@6¾ }
Nos. 7 to 14.....60&10% } 3% cash
Nos. 15 to 18.....47½&% }
Nos. 19 to 22.....70&%
Concord Axles, loose collar.....4½¢@6¢
Concord Axles, solid collar.....5½¢@7¢
Salona Tubular Self Oiling.....
33⅓&33⅓&5%

Bag Holders—See *Holders, Bag.*

Balances—

Spring Balances.....40%

No.	2000	20	30
Chatillon, ₩ doz.	$0.80	0.95	1.75 net

Chatillon Straight Balances.....40%
Chatillon Circular Balances.....50&10%

Barb Wire.—See *Wire, Barb.*

Bars—

Crow—

Cast Steel.....₩ ℔ 3½¢
Iron, Steel Points.....₩ ℔ 3¢

Basins, Wash—

Standard Fiberware, No. 1, 10¾-in., $1.80; 12-inch, $2.00; 13½-inch, $2.50; 15-inch, $3.00.

Beams, Scale—

Scale Beams, List Jan. 12, '82..50&10@50&10&5%
Chatillon's No. 1.....40%
Chatillon's No. 2.....50%
Custer's.....33⅓&%

Beaters—

Egg—

Dover.....₩ doz $1.00@$1.20
Duplex (Standard Co.).....₩ doz $1.00
Dover (Standard Co.).....₩ doz $1.00
Duplex Extra Heavy (Standard Co.)....
₩ doz. $3.50
Bryant's.....₩ gross $14.00
Double (H. & R. Mfg. Co.), ₩ gro., No. 0 $12.00; No. 1, $15.00; No. 2.....$36.00
Easy (H. & R. Mfg. Co.).....₩ gro $12.00
Triple (H. & R. Mfg. Co.).....₩ gro $16.50
Spiral.....₩ gro $4.25 @ $4.50
Improved Acme (H. & R. Mfg. Co.)....
₩ gro. $9.00
Silver & Co.....₩ doz $5.50

Culinary—

Keystone, P. D. & Co., Each, No. 1, $1; No. 2, $2.....20%

Bells—

Cow—

Common Wrought.....60&10%
Western, Sargent's list.....70&10%
Kentucky, "Star".....20&10%
Kentucky, Sargent's list.....70&10%
Kentucky Durham.....70&10%
Dodge, Genuine Kentucky....70@70&10%
Texas Star.....50&10@50&10&5%

Door—

Gong, Abbe's.....33⅓&10%
Gong, Yankee.....45&10%
Gong, Barton's.....40&10@50%
Crank, Brooks'.....50&10&2%
Crank, Cone's.....10%
Crank, Connel's.....20&10%
Lever, Sargent's.....60&10%
Lever, Taylor's Bronzed or Plated....net
Lever, Taylor's Japanned.....25&10%
Lever, R. & E. Mfg. Co.'s..50&10&2%
Pull, Brook's.....50&10&2%

Electric—

Wollensak's.....20%
Bigelow & Dowse.....20%

Hand—

Light Brass.....70&10@70&10&5%
Extra Heavy.....70%
White.....70%
Silver Chime.....33⅓&10%
Globe Cone's Patent).....25&10@35%

Miscellaneous—

Call.....45@50%
Farm Bells.....₩ ℔ 3¢&3½¢
Steel Alloy Church and School Bells..40%

Bellows—

Blacksmiths'.....60&10&5@60&10&10%
Molders'.....40&10@50%
Hand Bellows.....40&10@50%

Belting, Rubber—

Common Standard.....75@75&10%
Standard.....70&5@70&10%
Extra.....60&10@60&10&10%
N.Y.B.&P. Co., Carbon.....60@60&5%
N.Y.B.&P.Co., Diamond.....50@50&5%
N.Y.B.&P.Co., Para.....40@40&5%

Bench Stops—See *Stops, Bench*

Benders and Upsetters, Tire—

Stoddard's Lightning Tire Upsetters..15%
Detroit Perfected Tire Bender.....15%
Green River Tire Benders and Upsetters.....20%

Bits—

Auger, Gimlet, Bit Stock Drills, &c., see *Augers and Bits.*

Bit Holders—See *Holders.*

Blind Adjusters—See *Adjusters, Blind.*

Blind Fasteners—See *Fasteners, Blind.*

Blind Staples—See *Staples, Blind.*

Blocks—

Cleveland Block Co., Mal. Iron..60&10&5%
Moore's Novelty, Mal. Iron.....50%
Sure Grip Steel Tackle Blocks.....25%
See also *Machines, Hoisting.*

Bolts—

Carriage, Machine, &c.—

Com. list June 10, '84.....75&10&5@80%
Genuine Eagle, Norway, list Oct. '84....
80&5@80&10%
Eagle, Norway, list Oct. '84 80&10@80&15
Phila. pattern, list Oct. 7, '84..... 80%
R.B.&W., old list.....70%
Machine, list Jan. 1, 1890.....80&10%
Bolt Ends, list Jan. 1, 1890.....80&10%

Door and Shutter—

Cast Iron Barrel, Square, &c.....70&10%
Cast Iron Shutter Bolts.....70&10%
Cast Iron Chain (Sargent's list)....65&10%
Ives' Patent Door Bolts..60&10@60&10&5%
Wrought Barrel.....70&10@75%
Wrought Square.....70&10@75%
Wr't Shutter, all Iron, Stanley's.....
60&10@60&10&10%
Wr't Shutter, Brass Knob.....50@50&5%
Wr't Shutter, Sargent's list.....60&10%
Wr't Sunk Flush, Sargent's list....60&10%
Wr't Sunk Flush, Stanley's list.50&10&5%
Wr't B. K.Flush, Common.....55&10%

Stove and Plow—

Stove.....60&10@60&10&5%
Plow.....60&10&50@60&10&10%
R. B. & W., Plow.....55%

Tire—

Common, list Feb. 28, '83.....65@65&5%
Port Chester Bolt and Nut Company:
Empire list Feb. 28, '83.....65%
Keystone, Philadel., list Oct. '84.....80%
Norway, Phila., list Oct. '84.....75%
American Screw Company:
Norway, Phila., list Oct. 16, '84.....75%
Eagle, Phila., list Oct. 16 '84.....80%
Philadel., list Oct. 16, '84.....80%
Bay State, list Feb. 28, '83.....65%
R. B. & W., Philadel., list Oct. 16, '84..80%

Borers, Tap—

Common and Ring.....20&10%
Ives' Tap Borers.....33⅓&5%
Enterprise Mfg. Co.....20%
Clark's.....33⅓@36%

Borax—

Per ℔.....9½@10½¢

Boring Machines—See *Machines, Boring.*

Bow Pins—See *Pins, Bow.*

Boxes, Wagon—

Per ℔.....2¼¢

Boxes, Miter.

Spliker's Excelsior, 3 in. $7.50, 4 in $8 50, 5 in. $13.00, 6 in. $15.00.....20%

Braces—

American Bit Brace and Tool Co.,
Nos. 10, 12, 20.....60&10%
Nos. 11, 21, 24, 27.....70&10%
Nos. 22, 23, 25.....60&10&5%
Nos. 13, 26, 36, 37.....70&10&5
Amidon's,
Barker's Imp'd Plain.....75&10@80%
Barker's Imp. Nickeled.....65&10@70%
Ratchet.....75&10@80%
Eclipse Ratchet.....60%
Globe Jawed.....40@40&10%
Corner Brace.....40@40&10%
Universal, 8 in., $2.10; 10 in.....$2.25
Buffalo Ball.....$1.10@$1.15
Barber s.....60&10%
Saxton's,
Barker's Imp. Polished.....75&10@80%
Barker's Imp. Nickeled.....65&10@70%
Ratchet, Polished.....50&10@60%
Ratchet, Nickeled.....40&10@50%
Buffalo Ball.....net, $1.10@$1.15
Bartholomew s,
Nos. 25, 27 and 30.....50&10@60&5%
Nos. 117, 118, 119.....70@70&5%
Common Ball, American.....$1.00@$1.10
Fray's Genuine Spofford s...50&5@50&10%
Fray's Nos. 70 to 120, 81 to 123. 207 to 414 50&10%
Ives' New Haven Novelty.....70@70&5%
New Haven Ratchet.....60&5@60&10%
Barber Ratchet.....60&5@60&10%
Barber's.....60&5%
Spofford.....60&5@60&10%
P. S. & W. Co., Peck's Patent.....60%
Rose & Johnson.....50%
Davis Patent.....50&10%

Brackets—

Shelf, plain,
Regular, list.....65@70%
Sargent's list.....60&10@70&10%
Shelf, fancy,
Sargent's list.....70@70&10%
Other makes at a wide range of prices.
Bradley Shelf Brackets.....70&10%

Bright Wire Goods—See *Wire.*

Broilers—

Heuis' Self-Basting. { Inch..... 9 10 9x11
Per doz...$4.50 5.50 6.50
New Haven.....50%
Wire Goods Co.....65&10%
Morgan Odorless.....₩ doz. $12, 50%
Queen City.....33⅓&%

Buckets, Well—

Galvanized—

Hill's.....₩ doz. 12 qt. $4.25; 14 qt. $5.25
Iron Clad.....₩ doz. 14 qt. $4.25@4.50
Helwig's Flat Iron Band.....$3.75
Helwig's Wired Top.....₩ doz $4.00

Bull Rings—See *Rings, Bull.*

Butcher's Cleavers—See *Cleavers Butchers.*

Brass—

Wrought Brass.....80@80&%
Cast Brass, Tiebout's.....
Cast Brass, Fast.....33⅓&10%
Cast Brass, Loose Joint.....33⅓&10%

Cast Iron—

Fast Joint, Narrow.....50&10&5@60
Fast Joint, Broad.....50&10@60%
Loose Joint.....
Loose Joint, Japanned.....
Loose Joint, Jap. with Acorns..
Parliament Butts.....
Mayer's Hinges.....
Loose Pin, Acorns.....
Loose Pin, Acorns, Japanned...
Loose Pin, Acorns, Japanned, Plated Tips.....
} 75@75 &10%

Wrought Steel—

Fast Joint, Narrow.....
Fast Joint, Lt. Narrow.....
Fast Joint, Broad.....
Loose Joint, Broad.....
Table Butts, Back Flaps, &c.....
Inside Blind, Regular.....
Indide Blind, Light.....
Loose Pin.....
} List Jan. 2 1893. 40@40&10%
Bronzed Wought Butts.....50@50&10%

Calipers—See *Compasses.*

Calks, Toe—

Gautier, One Prong, Blunt.....5½@6¢
Burke's One Prong, Blunt.....6¼@6¢
Burke's, Two Prong, Blunt.....7¼@8¢
Burke's, One Prong, Sharp.....6¼@7¢

Can Openers—See *Openers, Can.*

Cans, Milk—

S. S. & Co.: 5-gal., $3.00; 8-gal., $4 40; 10-gal., $4.75 each.....40&10%

Cans, Oil—

Galvanized Blue Band, 5 gal., Tip-Top, ₩ doz. $12.00
Galvanized Blue Band, 5 gal, Faucet, ₩ doz., $8.00
Galvanized Blue Band,1 gal.,₩ doz.$2.25
Glass Oil, Friend.....₩ doz.$2.75

Caps—

Percussion—

Hicks & Goldmark's and Union Metallic Cartridge Co. ₩ 100¢
F. L. Waterproof, 1-10's.....35@37¢
E. B. Trimmed Edge, 1-10's.....47@50¢
E. B. Grnd. Edge, Cent. Fire, 1-10's....47@50¢
Musket. Waterproof, 1-10's.....50@55¢
G. D.....27@30¢
S. B. Genuine Imported.....45¢
Eley's E. B.....56@55¢
Eley's D Waterproof, Central Fire..$1.60

Primers—

Berdan Primers, $1.00.....25
B. L. Caps (Sturtevant Shells) $1.00....25
All other Primers, $1.20.....25

Cards—

Watson's Cotton, Wool, Horse and File, list January 28, 1891.....25%

Carpet Stretchers—See *Stretchers, Carpet.*

Cartridges—

Rim Fire Cartridges.....50&5&2%
Rim Fire Military.....15&2%
Cent. Fire, Pistol and Rifle.....25&5&2%
Cent. Fire, Military and Sporting 15&5&2%
Blank Cartridges, except 22 and 32 cal., additional 10% to above discounts.
Blank Cartridges, 22 cal., $1.75.....2%
Blank Cartridges, 32 cal., $3.50.....2%
Primed Shells and Bullets.....15&5&2%
B. B. Caps, Round Ball, $1.75.....2%
B. B. Caps, Con. Ball, Swgd., $2.00.....2%

Carpet Sweepers—See *Sweepers, Carpet.*

Casters—

Bed.....
Plate.....
Shallow Socket...
Deep Socket.....
Martin's Patent (Phœnix).45&10@50&10%
Tucker's Patent, low list.....45%
Payson's Anti-friction.....70@70&10%
Payson's Truck.....60@60&10%
Yale Casters, low list.....45%
Yale, Gem.....70%
Giant Truck Casters.....35%
Stationary Truck Casters.....50&10%
Socket Truck Casters.....50@50&10%
Gwinner's Common Sense.....45%
Gwinner's Hercules.....45%
} Brass.....55@55&10% Others.....60@60&10%

Cattle Leaders—See *Leaders, Cattle.*

Cement—

Victor Elastic.....5 ℔ pails ₩ ℔ 5¢

Chain—

Trace, Wagon and Fancy Chains, List revised May, 1893.....60@60&10%
American Coil, in cask lots,

3-16	¼	5-16	⅜	7-16	½	⅝	¾
$7.60	5.30	4.45	3.80	3.65	3.50	3.40	3.30

Less than cask lots, add1¼¢@1¢ ₩ ℔
German Coil, list July 12, 1892 60@60&10%
German Halter Chain, list July 12, 1892. 60@60&10%
Covert Halter.....60&2%
Cover Traces.....35&2%
Cover Wheel Chain.....50&2%
Galvanized Pump Chain.
5 ton lots.....₩ 100 ℔ $5.50
1-ton lots.....₩ 100 ℔ $5.75
500-℔ lots.....₩ 100 ℔ $6.75
Less than 500 ℔.....₩ 100 ℔ $7.00
Oneida Halter Chain.....60@60&5%
Jack Chain, Iron and Brass, list July 10, 1893.....60%
Barnes' Reinforced Sash.....60&10%
Barnes' Victor Sash.....65%

Chalk—

White, case lots. ₩ gr 50¢, small lots.65¢
Red, case lots....₩ gr 67¢ small lots.75¢
Blue, case lots....₩ gr 75¢; small lots 90¢
See also Crayons

Chalk Lines—See *Lines.*

Checks, Door—
Unity 50%

Chisels—

Socket Framing and Firmer
P. S. & W. .....
New Haven .....
Witherby .....
Mix .....
Ohio Tool Co. ..... } 75&10@75&10&10%
Douglass ..... 75@75&5%
Buck Bros. 30%
Merrill ..... 60&10@60&10&5%
L. & I. J. White ..... 30@30&5%

Tanged and Miscellaneous.
Tanged Firmers ..... 50@50&10%
Butchers' ..... $4.75@5.00
Spear & Jackson's ..... $5 to $
Buck Bros. 30%
Cold Chisels, ℔ ..... 15@16¢

Chucks—
Beach Pat. ..... each, $8.00 ..... 20%
Morse's Adjustable, each, $7.00, 20@20&5%
Danbury ..... each, $6.00, 30@30&5%
Syracuse, Balz Pat. 25%
Graham Patent 33⅓%
Skinner's Patent Chucks.
Combination Lathe Chucks 33⅓%
Universal Lathe Chucks 40%
Independent Lathe Chucks 40%
Drill Chucks 15%
Union Mfg. Co.
Victor $8.50, 25%
Combination 40%
Universal 40%
Independent 40%

Churns—
Tinn Union, each, 5 gal. $3.25; 7 gal., $3.75; 10 gal., $4.25.
McDermaid Star Barrel Churn, each 6 gal., $2.60; 10 gal., $2.75; 15 gal., $3.00; 20 gal., $3.25.

Clamps—
E. I. Tool Co.'s Wrought Iron 25%
Adjustable, Cincinnati ..... 15&10%
Adjustable, Hammers ..... 15@15&5%
Adjustable, Stearn's ..... 30@30&10%
Stearn's Adjustable Cabinet and Corner ..... 30@30&10%
Cabinet, Sargent's ..... 70&10%
Carriage Makers', Sargent's .. 75@75&5%
Carriage Makers', P., S. & W Co. .. 40&10%
Eberhard Mfg. Co. ..... 40&5@40&10%
Warner's ..... 40&10@40&10&5%
Saw Clamps, see Vises, Saw Fillers'.
Carpenter's, Cincinnati ..... 25&10%
Barnes' Machinists' Clamps. 33⅓%

Cleavers, Butchers'—
Bradley s ..... 25@30%
L. & I. J. White ..... 20&5%
Beatty's ..... 40@40&5%
New Haven Edge Tool Co.'s 40%
P., S. & W. ..... 33⅓&5@33⅓&10%
Foster Bros. 30%
Schulte, Lohoff & Co. ..... 40@40&5%

Clips—
Norway, Axle, ¼ & 5-16 ..... 55&5&5%
2d grade Norway Axle, ¼ & 5-16 .... 65&5%
Superior Axle Clips ..... 66⅔&5&70%
Norway Spring Bar Clips, 5-16 .. 60&5&5%
Wrought Iron Felloe Clips ..... ℔, 5½¢
Steel Felloe Clips ..... ℔, 5¢
Baker Axle Clips 25%

Cloth and Netting, Wire
—See *Wire, &c.*

Cockeyes 50%

Cocks Brass
Hardware list ..... 60&2%

Coffee Mills—See *Mills, Coffee.*

Collars, Dog—
Chapman Mfg. Company, new list 40%
Medford Fancy Goods Co. .... 40&10@50%
Embossed, Gilt, Pope & Steven's list, 30&10%
Leather, Pope & Steven's list 40%
Brass, Pope & Steven's list 40%

Combs, Curry—
Fitch's ..... 50&10@50&10&10%
Rubber, per doz., $10.00 ..... 25%
American Curry Comb Co. ..... 33⅓&40%
Kohler's Magic Oscillating .. ℔ doz., $2.00
Kohler's Humane ..... ℔ doz., $1.75

Compasses, Dividers, &c.
Compasses, Calipers, Dividers. 70@70&10%
Bemis & Call Co.'s
Dividers 65%
Compasses ..... 50&5%
Calipers, Inside or Outside 65%
Calipers, Wing 60%
Calipers, Double 65%
Calipers, Call's Patent Inside 55%
Excelsior 50%
. Stevens & Co.'s ..... 25&10%
Starrett's
Spring Calipers and Dividers .... 25&10%
Lock Calipers and Dividers 25%
Combination Dividers 25%

Coolers, Water—
S. S. & Co.: 2-gal., $2 00; 3-gal., $2.50; 4-gal., $2.75; 6-gal., $3.40 each 33⅓%

Coopers' Tools—
See *Tools, Coopers'.*

Cord—

Sash—
Common ..... ℔ ℔, 8½@9¢
Patent, good quality ..... ℔ ℔, 10@11¢
White Cotton Braided, fair .. ℔ ℔, 23@24¢
Common Russia Sash ..... ℔ ℔, 12½@13¢
Patent Russia Sash ..... ℔ ℔, 13½@ 14¢
Cable Laid Italian Sash ..... ℔ ℔, 19@20¢
India Cable Laid Sash .... ℔ ℔, 11½@12¢
Silver Lake—
A quality, White, 50¢ 25%
A quality, Drab, 55¢ 25%
B quality, White, 30¢ 10%
B quality, Drab, 35¢ 10%
Sylvan Spring, Extra Braided, White. 34¢
Sylvan Spring, Extra Braided, Drab. 39¢
Semper Ideni, Braided, White .... 27@28¢
Egyptian, India Hemp, Braided ..... 26¢
Massachusetts, White ..... 29¢
Samson—
Braided, White Cotton ..... ℔ ℔, 37¢
Braided, Drab Cotton ..... ℔ ℔, 42¢
Braided, Italian Hemp ..... ℔ ℔, 40¢
Braided, Linen ..... ℔ ℔, 56¢
Tate's Solid Braided—
Hercules, White ..... ℔ ℔, 25¢
Hercules, Drab ..... ℔ ℔, 30¢
Economy Drab ..... ℔ ℔, 27¢
Economy White ..... ℔ ℔ 22¢
Ossawan Mills—
Braided Giant, Whit ℔ ℔, 30¢ 20%
Braided Giant, Drab and Fancy, ℔ ℔ 25¢ 10%
Braided, Crown White, ℔ ℔, 50¢ .. 50%
Braided, Crown Drab and Fancy, ℔ ℔ 5¢ 30%

Wire Picture—
Braided or Twisted ..... 80&5@80&15%

Corkscrews—See *Screws, Cork.*

Corn Knives and Cutters
—See *Knives, Corn.*

Crackers Nut—
Table (H. & B. Mfg. Co.) 40%
Blake's Pattern, ℔ doz., $2.00 ..... 10%
Turner & Seymour Mfg. Co. 50%
Acme.
Japanned, ℔ gro., $30 ..... 50%
Nickel Plated, ℔ gro. $30 ..... 10%

Cradles—
Grain ..... 50&2@50&5&2%

Crayons—
White Crayons, ℔ gross ..... 7@8¢
D. M. Stewart Mfg. Co.:
Metal Workers', ℔ gross, $1.75 ..... 25%
Rolling Mill, ℔ gross, 2.50 ..... 25%
Railroad, ℔ gross, 2.00 ..... 25%
Soapstone Pencils, ℔ gross, 1.00 ..... 25%
See also *Chalk.*

Creamery Pails—See *Pails, Creamery.*

Crow Bars—See *Bars, Crow.*

Curry Combs—
See *Combs, Curry.*

Curtain Pins—
See *Pins, Curtain.*

Cutters—

Meat—
Dixon's, ℔ doz. ..... 40@10&5%
Nos. 1 2 3 4
$14.00 $17.00 $19.00 $30.00
Woodruff's, ℔ doz. ..... 40@40&5%
Nos. 100 150
$15.00 $18.00
Hale's, ℔ doz. 70%
Nos. 11 12 13
$27.00 $33.00 $45.00
American 30%
Nos. ..... 1 2 3 4 B 5
Each $5 $7 $10 $25 $50 $80
Enterprise 25%
Nos. 10 12 22 32 42
Each $3 $2.50 $4 $6 $15
Little Giant, ℔ doz. ..... 40&10@50%
Nos. 305 310 320 322
$35.00 $48.00 $44.00 $72.00 $68.00
Triumph No. 505, ℔ doz., $21.00 .. 25@30%
Miles' Challenge, ℔ doz. ..... 45@45&10%
Nos. 1 2 3
$22.00 $30.00 $40.00
Home No. 1, ℔ doz., $26.00 ..... 55&10%
Draw Cut, each:
Nos. 5 2 6 8
$50 $75 $80 $225 ..... 20@25%
Beef Shavers (Enterprise) 20%
Chadborn's Smoked Beef Cutter, ℔ doz., $66.00

Slaw and Kraut—
Tucker & Dorsey Mfg. Co.:
Slaw Cutters, 1 Knife, ℔ gross .. $21.00
Slaw Cutters, 2 Knife, ℔ gross ... 30.00
Kraut Cutters 40%

Tobacco—
Champion ..... 20@10@30%
All Iron ..... ℔ doz., $4.25
Nashua Lock Co.'s .. ℔ doz., $18.00, 50@55%
Wilson's 55%
Sargent's ..... ℔ doz. $24.00, 55&10
Acme ..... ℔ doz., $20.00, 40%

Washer—
Smith's Pat. .... ℔ doz., $12.00, 20&10&10%
Johnson's ..... ℔ doz., $11.00, 33⅓%
Penny's .. ℔ doz.,, Pol. $14; Jap'd, $16, 55%
Appleton's ..... ℔ doz., $16.00, 60&10%
Bonney's ..... 30&10%
Cincinnati ..... 25&10%

Diggers, Post Hole, &c.—
Samson, ℔ doz., $34.00 ..... 25@25&10%
Fletcher Post Hole Augers, ℔ doz., $36.00, 20@20&10%
Eureka Diggers .... ℔ doz. $12.00@$13.00
Vaughan's Post Hole Auger, ℔ doz., $8.50@$9.50
Kohler's Little Giant ..... ℔ doz., $18.00
Kohler's Hercules ..... ℔ doz., $14.00
Kohler's Invincible ..... ℔ doz., $12.00
Kohler's New Champion .... ℔ doz., $8.00
Scheidler ..... ℔ doz., $18.00
Cronk's Post Bars, ℔ doz., $60.00, 50&5@50&10%
Gibb's Post Hole Digger .... ℔ doz., $15.00
Gibbs' National ..... ℔ doz., $12.00
Gibbs' Columbia ..... ℔ doz., $13.00
Gibbs' Imperial ..... ℔ doz. $7.50
Shimer's Hollow Handle .. ℔ doz., $24.00, 50%
Gem, Improved ℔ doz.., $9.00@$10.00 net

Dividers—See *Compasses.*

Dog Collars—See *Collars, Dog.*

Door Checks—
See *Checks, Door.*

Door Springs—
See *Springs, Door.*

Drawers.
Money, ℔ doz. ..... $18@$20
Waddell's Improved, ℔ doz. $15.00

Drawing Knives—
See *Knives, Drawing.*

Drills and Drill Stocks—
Blacksmiths' ..... each $1.75
Blacksmiths' Self-Feeding, each $7.50, 20%
Breast, P. S. & W. ..... 40&10%
Breast, Wilson's ..... 30&5%
Breast, Millers Falls ..... each $3.00, 25%
Breast, Bartholomew's .... each $2.50 25&10@40%
Ratchet, Merrill's ..... 20@20&5%
Ratchet, Ingersoll's 25%
Ratchet, Parker's ..... 20@20&5%
Ratchet, Whitney's ..... 20&10%
Ratchet, Weston's ..... 20@25%
Ratchet, Moore's Triple Action .... 25@30%
Ratchet, Curtis & Curtis 30%
Whitneys Hand Drill, Plain, $11.00; Adjustable, $12.00 ..... 20&10%
Automatic Boring Tools ..... $1.75@$1.85
Chicopee Automatic Drill ..... 20&10%
Goodell Automatic Drills ..... 40&5%

Twist Drills—
Cleveland ..... 50&10&10%
Diamond, W. & B. ..... 50&10&10%
Graham's Pat. Groove Shank .. 50&10&10%
Morse ..... 50&10&10%
New Process ..... 50&10&10%
Standard ..... 50&10&10%
Syracuse (Metal list) ..... 50&10%

Drill Bits or Bit Stock Drills—See *Augers and Bits.*

Drill Chucks—See *Chucks.*

Dripping Pans—
See *Pans, Dripping.*

Drivers, Screw—
Douglass Mfg. Co. ..... 20@20&10%
Disston's 50%
Buck Bros. 30%
Stanley R. & L. Co.'s
No. 64, Varnished Hard .s ..... 65&10%
No. 86 ..... 70&10%
Sargent & Co.'s
No. 1, Forged Blade ..... 60&10&10%
Nos. 20, 40 and 60 ..... 66⅔&10&10%
P. S. & W. 70%
Knapp & Cowles
No. 1 ..... 60&20@70%
No. 2 ..... 60&10&10@70&5%
No. 3 ..... 60&5@60&10%
Nos. 4 and 00, Acme and Ideal .. 50&5@ 50&10&5%
Stearns' ..... 25&10&5%
Gay & Parsons 35%
Champion ..... 25&10%
Clark's Pat. ..... 30@33⅓%
Ellrich's Socket and Ratchet .. 25@25&10%
Allard's Spiral, new list 25%
Kolb's Common Sense .. ℔ doz., $6.00, 25&10%
Syracuse Screw-Driver Bits ..... 30&30&5%
Screw Driver Bits ..... ℔ doz., 50@75¢
Screw Driver Bitts, Parr's .. ℔ gross, $6.25
Fray's Hol. H dle Sets ... No. 3, $12.00, 45%
Cincinnati ..... 25&10%
Brace Screw Drivers ..... 25&10%
Buck Bros.' Screw Driver Bits .... 27½&5%
Goodell's Automatic 50%
Mayhew's Black Handle 50%
Mayhew's Monarch ..... 45&10%
C. T. Williamson Wire Novelty Co. 50%

Egg Beaters—See *Beaters, Egg*

Egg Poachers—
See *Poachers, Egg.*

Electric Bell Sets—
See *Bells, Electric.*

Emery—No. 4 to No. 54 to Flour, CF.

	46 gr.	150 gr.	F.FF.
Kegs, ℔ ℔	4½¢	5 ¢	2½¢
½ kegs, ℔ ℔ ..	4¾¢	5½¢	2¾¢
¼ kegs, ℔ ℔ ..	5 ¢	5½¢	3 ¢
10-℔ cans, 10 in case	6 ¢	6½¢	5 ¢
10-℔ cans, less than 10	10 ¢	10 ¢	7½¢

Enameled and Tinned Ware—See *Ware, Hollow*

Escutcheon Pins—
See *Pins, Escutcheon.*

Escutcheons—
Door Lock .... Same dis. as Door Locks.
Brass Thread ..... 60@60&10%
Wood 25%

Expanded Metal—
List No. 5.
Lathing 10%
Fencing, Painted Sheets 20%
Netting, Painted Sheets 20%
Door Mats, Galvanized 25%
Window Guards, Paneled 15%
Tree Guards, Paneled 15%

Extractors, Lemon Juice
—See *Squeezers, Lemon.*

Fasteners, Blind—
Mackrell's, ℔ doz., $1.00 ..... 20@20&10%
Van Sand's Screw Pat, $15 ℔ gr. . 60&10%
Van Sand's Old Pat., $15 ℔ gr. .... 55&10%
Austin & Eddy No. 2008 ..... ℔ gr., $9.00
Security Gravity ..... ℔ gr., $9.00
Zimmerman's ..... 60&10%

Faucets—
Fenn's 40%
Fenn's Cork Stops 33⅓%
Star 60%
Frary's Pat. Petroleum 60%
B. & L. B. Co.
West's Lock, Open and Shut Key .. 50%
Star, Metal Plug, new list 40%
Lockport, Metal Plug, reduced list .. 60%
Metallic Key, Leather Lined .... 60&10@ 60&10&10%
Cork Lined ..... 70&5@70&10%
Burnside's Red Cedar 50%
Burnside's Red Cedar, bbl. lots .... 50&10%
John Sommers'
Peerless Best Block Tin Key 40%
IXL, 1st quality, Cork Lined 50%
Diamond Lock 40%
Perfection, Fla. Red Cedar (in boxes) 40%
Boss Metallic Key 50%
Reliable Cork Lined 60%
O. K. Western Pattern Cork Lined .. 50%
No Brand, Red Cedar (in bbls.) .. 50&10%
Western Pattern Metal Key 40%
No Brand Metal Key 80%
Self Measuring
Enterprise, ℔ doz., $36.00 ..... 20%
Lane's ℔ doz., $36.00 ..... 25&10%

Felloe Plates—
See *Plates, Felloe.*

Fibre Ware—See *Ware, Fibre.*

Fifth Wheels—
Derby and Cincinnati ..... 45&5%
Brewster ..... 50&5%

Files—

Domestic—
Nicholson Files, Rasps, &c. 60&10&5@ 60&10&10%
Nicholson (X.F.) Files 25%
Nicholson's Royal Files (Seconds) .... 75% (extra prices on certain sizes.)
American ..... 66⅔&10@66⅔&10&5%
G. & H. Barnett (Black Diamond) 60&10@60&10&5%
Arcade ..... 60&10&10@70%
Eagle ..... 60&10&10@70%
Other makers, best brands .. 60&10&5@70%
Fair brands ..... 70&10@70&10&10%
Second quality ..... 80@80&5%
Heller's Horse Rasps ..... 50&7½@50&10%
McCaffrey's Horse Rasps ..... 50&10%
Chelsea Horse Rasps, Hand Cut .... 50&10%
Arcade Horse Rasps .... 60&10@60&10&5%
Trojan Horse Rasps ..... 60&10&5%

Imported—
Butcher ..... Butcher's li t, 20%
Stubs ..... Stub's' list 25@30%

Fixtures Grindstone—
Sargent's Patent ..... 70&10%
Reading Hardware Co. ..... 30&10%
P., S. & W. Co. ..... 50&10%
Moore's 55%

Fluting Machines—
See *Machines, Fluting.*

Fluting Scissors—
See *Scissors, Fluting.*

Fodder Squeezers—
See *Squeezers, Fodder.*

Forks—
Hay, Manure, &c. Asso. List. 70@70&5&2%
Hay, Manure, &c., Phila. List, 60@60&10&10%
Plated, see Spoons.

Frames—

Saw—
White Vermont ..... ℔ gro., $9.00@$10.00
Red, Polished and Varnished .... ℔ doz., $1.50, 25%

Screen, Window and Door—
Porter's Pat. Window and Door Frame, 33⅓&10%
Warner's Screen Corner Irons .... 33⅓% 33⅓&10%
Stearns Frames and Corners. 25@25&10%
Cortland ..... 40@40&5
Phillips' Window Screen Frames, 50@50&5%
Bonanza Window Screens .. 50&5@50&10%
Empire Fancy Screen Doors, ℔ doz .. $12

Freezers Ice Cream—
White Mountain ..... 60@60&5%
Granite State ..... 65@65&5%
Arctic ..... 70@70&5%
American 60%
Buffalo Champion ..... 65@65&5%
Shepard's Lightning ..... 65@65&5%
Gem 65%
Blizzard 70%
Double Action Crown 60%
Crown 60%
Star 60%
Peerless ..... 60&10%
Giant 60%
Zero 70%
Boss and Pet ..... 60&10&10&10%
Keystone, P., D. & Co., each, $1.50 .... 20%
Standard ..... 60@60&5%
Standard Double Action ..... 60@60&5%
Good Luck ..... 65@65&5%
Model ..... 60@60&5%
Confectioners' Machine 50%

Fruit and Jelly Presses—
See *Presses, Fruit and Jelly.*

Fruit Pickers—
See *Pickers, Fruit.*

Fry Pans—See *Pans, Fry.*

Funnels—
Gersdorff's Perfection, Standard and Globe; *Tin*, 1 gro., 10%; 2 to 5 gro., 20%; 5 to 10 gro. 30%
Copper, 1 to 6 doz., 15%; 6 to 12 doz., 20%; over 12 doz. 25%

Furnaces, Soldering—
Burgess No. 3 Gem tin reservoir $7.00
Burgess No. 3 Gem, Copper reservoir. $8.50
Clayton & Lambert No. 1 Fire-Pot, complete $6.00

Fuse—Dis. 12½@15%. ℔ 1000 ft.
Common Hemp Fuse, for dry ground. $2.70
Common Cotton Fuse, for dry ground 2.35
Single Taped Fuse, for wet ground.. 3.85
Double Taped Fuse, for very wet gr.. 4.80
Triple Taped Fuse, for very wet gr.. 5.60
Small Gutta Percha Fuse, for water. 7.50
Large Gutta Percha Fuse, for water. 12.00

Gates Molasses—
Stebbin's Pattern ..... 80@80&5%
Stebbin's Genuine ..... 60&10&10%
Stebbin's Tinned Ends ..... 40&10%
Lincoln's Pattern ..... 70@70&10%
Weed's ..... 20&10%
Boss, ℔ doz.:
No. 1, $7; No. 2, $8; No. 3, $9; No. 4, $10 ..... 60&10&10%

Gauges—
Marking, Mortise, &c. ..... 60&10%
Starrett's Surface, Center and Scratch. 25&10%
Stanley R. & L. Co.'s Butt and Rabbet Gauge ..... 20&10%
Barrett's Comb. Roller Gauge, ℔ doz $8.00@$8.50
Hoague & Peck's Champion Gauge—
With Scale ..... ℔ doz., $5.00
Without Scale ..... ℔ doz., $4.00
Wire, Wheeler, Madden & Co. 10%
Wire, Morse's 25%
Wire, Brown & Sharpe's ..... 10@20%
Wire, P., S. & W. Co. ..... 10&10%

Gimlets—
Nail and Spike ..... 50&10&5%
Eureka Gimlets ..... 60&10%
Diamond Gimlets ..... ℔ gr $5.00
Double Cut, Shepardson's ..... 45@45&5%
Doub e Cut, Ives' ..... 60@60&5%
Double Cut, Douglass' ..... 40&10%

Glue—
Le Page's Liquid ..... 25@25&5%
Upton's Liquid 35%
Improved Process ..... 25@25&5%
Dodd's Liquid Glue ..... 25@25&5%

Glue Pots—See *Pots, Glue.*

Grease, Axle—
Fraser's ..... Keg ℔ ℔ 4¢, Pail ℔ ℔ 5¢
Fraser's, in boxes ..... ℔ gr $9.50
Dixon's Everlasting, in bxs. .. ℔ doz 1 ℔ $1.20; 2 ℔ $2.00
Dixon's Everlasting .... 10-℔ pails, ea. 85¢
Lower grades, special brands, ℔ gr $5.50@$7.00
Axleine, tin boxes ..... ℔ gross $12.00
English Coach, wooden boxes ..... ℔ gross $8.50
English Coach, 5-℔ tin pails .. ℔ doz. $3.50
Tiger, wooden boxes ..... ℔ gross $7.00
Tiger, 5-℔ tin pails ..... ℔ doz $2.85

Grindstones—
Family, regular list 60%
Family, Cleveland Stone Co. 30%

Grindstone Fixtures—
See *Fixtures, Grindstone.*

Gun Powder—See *Powder.*

Hack Saws—See *Saws.*

Hafts, Awl—
Sewing, Brass Fer. ℔ gr. $1 75
Pat. Sewing, Short. ℔ doz. ..... 45@50%
Pat. Sewing, Long ..... ℔ doz $1.80
Pat. Peg, Plain Top. ℔ doz. ..... 40@45%
Pat Peg, Leather Top. . . ℔ doz @50

Halters—

Covert's, Rope, Jute.....60&10&10&2%
Covert's Rope, 7-16 in., Jute.....70&2%
Covert's Rope, ½ in., Hemp.....50&2%
Covert's Adj. Rope Halters.....40&2%
Covert's Hemp Horse and Cattle Tie, 50&10&2%
Covert's Jute Horse Ties.....70&2%
Covert's Jute Cattle Ties.....70&10&2%
Covert's Adj. Web Halters.....35&5&2%
Covert's Saddlery Works Halters...33⅓&5
Covert's Saddlery Works Horse and Cattle Ties.....33⅓&5
Covert's Saddlery Works Handy Web Halters.....33⅓&5

Hammers—

Handled Hammers—

Maydole's, list Dec. 1, '85.....25&10@35%
Buffalo Hammer Co.....
Humason & Beckley.....
Atha Tool Co.....
Verree.....
....50&10%
C. Hammond & Son.....40&10@—%
Fayette R. Plumb.
Artisans' Choice, A. E. Nail.....40&10%
Regular Y. & P., A. E. Nail.....50%
Horseshoe Turning Hammers.....50%
Other Hammers.....50&10%
Cheney's Claw.....40&10%
Cheney's Machinist's & Riveting...50&5%
Magnetic Tack, Nos. 1, 2, 3, $1.25, 1.50 & 1.75.....30&10%
Nelson Tool Works.....40&10%
Warner & Nobles, new list.....25&10
Peck, Stow & Wilcox.....35@40%
Sargent's.....40@40&10%

Heavy Hammers and Sledges—

8 ℔ and under...℔ ℔40¢
8 to 5 ℔.....℔ ℔36¢
Over 5 ℔.....℔ ℔30¢
....75&10@75&10 &5%
Wilkinson's Smiths.....10½¢@11¢℔ ℔

Handcuffs and Leg Irons

—See *Police Goods.*

Handles—

Cross-Cut Saw Handles—

Atkins', new list.....40%
Champion.....15%
Ely's Perfection.....℔ doz., $3.00
Sensible.....40%

Iron, Wrought or Cast—

Door or Thumb.

Nos.	0	1	2	3	4
Per dos.	$0.90	1.00	1.08	1.35	1.50

60&10&10%
Roggin's Latches.....℔ doz 30¢@35¢
Bronze Iron Drop Latches..℔ doz 70¢ net
Jap'd Store Door Handles—Nuts, $1.62; Plate, $1.10; no plate, $0.88.....net
Barn Door, ℔ doz $1.40.....10&10%
Chest and Lifting.....70@70&10%

Wood—

Saw and Plane.....40&10@50%
Hammer, Hatchet, Axe, &c.....40@40&5%
Brad Awl.....℔ gr $2.00
Hickory Firmer Chisel, ass'd.℔ gr 4.50
Hickory Firmer Chisel, large.℔ gr 5.00
Apple Firmer Chisel, ass'd...℔ gr 5.00
Apple Firmer Chisel, large...℔ gr 6.00
Socket Firmer Chisel, ass'd..℔ gr 3.00
Socket Framing Chisel, ass'd.℔ gr 5.00
....40¢&10@50%
J. B. Smith & Co.'s Pat File.....50%
File, assorted.....℔ gr 2.75
Auger, assorted.....℔ gr 5.00
Auger, large.....℔ gr 7.00
.....50%
Pat. Auger, Ives'.....30&10%
Pat. Auger, Douglass.....℔ set $1.25
Pat. Auger, Swan's.....℔ set $1.00
Hoe, Rake, Shovel, &c.....60@60&5%

Hangers—

Barn Door, old patterns.....70@70&5%
Barn Door, New England.....70@70&5%
Samson Steel Anti-Friction.....55%
Orleans Steel.....55%
Hamilton Wrought Steel Track.....55%
Champion.....60&10%
Climax Anti-Friction.....55%
Zenith for Wood Track.....55%
Sterling.....50&10@60%
Victor, No. 1, $15.00; No. 2, $16.50; No. 3, $18.00.....50&2%
Kidder's.....50@50&10%
Boss.....60&10@60&10&5%
Best Anti Friction.....60&10@60&10&5%
Duplex (Wood Track).....60&10&5%
Terry's Modern.....50&10@50&10&5%
Terry's Ideal.....50&10@50&10&5%
Terry's Solid.....50&10@60%
Terry's Shield.....50&10@60%
Terry's Wrought Single Strap.....50&10%
Cronk's Patent, Steel Covered.....50&10%
Carrier Steel Anti-Friction.....50&10%
Richards'.....30@30&10%
Lane's New Standard.....50@50&3%
Lane's Standard.....50&5@50&10%
Lane's Parlor.....40%
Warner's Pat.....20&10&10%
Stearns' Anti-Friction.....20&10&10%
Stearns' Challenge.....25&10&10%
Cincinnati Nos. 1, $2.25; 3, $2.50; 4, $2.50.
Paragon, Nos. 5, 5¼, 7 and 8.....20&10%
Crescent.....60@60&10%
Nickel, Steel, Nos. 0, $25; 1, $20; 2, $15.....40&10@50%
Chicago Anti-Friction.....30&10%
Star.....40&10@40&10&5%
Barry.....50%
Interstate.....50&10@60%
Pendulum, Payson's.....40@40&10%
Moody.....45%
Economy, $6.00.....50&10%
Perfection.....50&10@50&10&5%
Lundy, Steel Parlor.....40%
Matchless.....50&10%
Magic.....45&10%
Wild West.....45&10%
Moore's Elevator.....33⅓&5
Moore's Baggage Car Door.....33⅓&5
Moore's Railroad.....55%

Harness Snaps—See *Snaps.*

Hatchets—

American Axe and Tool Co.
Blood's.....
Hunt's.....
Hurd's.....
Mann's.....
Peck's.....
Underhill's.....
....40 & 10
Buffalo Hammer Co.....
Fayette R. Plumb.....
O. Hammond & Son.....
Kelly's.....
Sargent's & Co.....
P., S. & W. Co.....
Ten Eyck Edge Tool Co.....
....60 & 50&5%
Collins.....10%
Schulte, Lohoff & Co.....5%@5&5%

Hay and Straw Knives—

See *Knives.*

Hinges—

Blind Hinges—

Parker.....75&2%
Huffer.....50%
Clark's, No. 3, 5, 40 and 50..80@80&5%
Clark's Mortise Gravity.....50%
Sargent's, Nos. 3, 5, 11, 12, 13.75@75&10%
Reading's Gravity.....75&10@75&10&5%
Shepard's.
Noiseless.....75&10%
Niagara.....80%
Buffalo.....80%
Clark's Genuine Pattern.....80%
O. S., Lull & Porter.....75&10%
Acme, Lull & Porter.....75%
Queen City Reversible...70&10&5@75%
Clark's, Lull & Porter, Nos. 0, 1, 1½, 2, 2½, 3.....75&10&2½%
North's Automatic Blind Fixtures, No. 2, for Wood, $9.00; No. 3, for Brick, $11.80.....10%

Gate Hinges—

Western.....℔ doz $4.20, 60@60&10%
N. E.....℔ doz $7.80, 60@60&10%
N. E. Reversible ℔ doz..$5.60, 60@60&10%
Clark's, Nos. 1 2, 3.....60&10&5%
N. Y. State.....℔ doz $4.90,60@60&10%
Automatic.....℔ doz $12.50, 50%
Shepard's.....60&10&5%

Spring Hinges—

Geer's Spring and Blank Butts...40%
Union Spring Hinge Co.'s list, March, 1886.....20%
Barker's Double Acting.....25%
Union Mfg. Co.....25%
Bommer's.....30%
Buckman's.....15@20%
Chicago.....30%
Bardsley's Patent Checking.....15%
Acme.....30%
U. S.....25&10%
Empire and Crown.....20%
Hero and Monarch.....55%
American, Gem and Star.....20%
Oxford.....20%
Royal.....66⅔%
Reliable.....60%
Champion.....60%
No. 10 Matchless.....60%
No. 25 Unbreakable.....60%
J. G. C. Covered, ℔ gro., $30.....50&5%
Samson.....60@60&7½%
Wiles', No. 1, ℔ gro., $16; No. 2.....$13
Devore, No. 1.....℔ gro., $13.00
Rex.....℔ gro., $13.00
Freeport.....℔ gro., $12.00
New Idea Nos. 1 and 10...℔ gross $13.00
New Idea Dbl. Acting.....45%
Ideal No. 3.....℔ gross $10.00
Stearns' Noiseless Floor Hinge, ℔ set, $5.00.....20&10@30%

Extra 5@10% often given.

Wrought Iron Hinges—

List February 14, 1891.
Strap and T.....50&10@50&10&5%
Corrugated Strap and T.....50&10&5%
Screw Hook and Strap... 6 to 12 in., ℔ ℔.. 4¢; 14 to 20 in., ℔ ℔..3½¢; 22 to 36 in., ℔ ℔.. 3¢
Screw Hook and Eye.... ⅜ in., ℔ ℔ 7½¢; ½ in., ℔ ℔ 5½¢; ⅝ in., ℔ ℔ 4½¢
Rolled Blind Hinges, Nos. 32 and 34 50&10%
Rolled Blind Hinges, Nos. 232 and 234 55&10%
Rolled Plate.....70&10%
Rolled Raised.....70&10¢
Plate Hinges { 8, 10 & 12 in., ℔ ℔.....5¢; "Providence" over 12 in. ℔ ℔.....4¢

Hoes—

Eye—

D. & H. Scovil.....20%
Lane's Crescent, Planters' Pattern.45&5%
Lane's Razor Blade, Scovil Pattern...30%
Maynard, S. & O. Pat.....45&5%
Sandusky Tool Co., S. & O. Pat.....60&5 @60&10%
Am. Axe and Tool Co., S. & O. Pat.....
Chattanooga Tool Co., S. & O. Pat..60& 5@60&10%
Grub.....60&10%

Handled—

Garden, Mortar, &c.....70@70&5&2%
Planter's, Cotton, &c.....70@70&5&2%
Warren Hoe.....60@60&5%
Magic.....℔ doz $4.00

Hog Rings and Ringers—

See *Rings and Ringers—*

Hoisting Apparatus—

See *Machines, Hoisting.*

Hollow-Ware—

See *Ware, Hollow.*

Holders—

Bag—

Sprengle's Pat.....℔ doz $18....60%

Bit—

Extension.
Barber's, ℔ doz $15.00.....40@40&10%
Ives, ℔ doz $20.00.....60&5@60&10%
Diagonal.....℔ doz $24.00, 40%
Angular.....℔ doz $24.00, 40&5%

File and Tool—

Balz Pat.....℔ dos $4.00, 25%
Nicholson File Holders.....20%

Sash—

Motley's Adj. Sash, Medium Size..... ℔ doz $1.20, 40%

Hooks—

Cast Iron—

Bird Cage, Sargent's List.....
Bird Cage, Reading.....
Clothes Line Sargent's list.....
....60&10&10%
Clothes Line Moore's.....70%
Clothes Line, Reading list, 60&10@60&10&10%
Ceiling, Sargent's list.....55&10&10%
Harness, Reading list..55&10@55&10&10%
Coat and Hat, Sargent's list. 55&10@60&10%
Coat and Hat, Reading, 50&10@50&10&10%
Coat and Hat, Moore's.....70%

Wrought Iron—

Cotton.....℔ doz $1.25
Cotton Pat. (N. Y. Mallet and Handle Works.....30%
Tassel and Picture, T. & S. Mfg.Co....50%
Wrought Staples Hooks, &c. See Wrought Goods

Wire—

Wire Coat and Hat, Gem, list April, 1886.....60@60&10
Wire Coat and Hat, Miles, list April, 1886.....50@50&10%
Indestructible Coat and Hat...45@45&5%
Wire Coat and Hat, Standard.60@60&10%
Handy Hat and Coat.....50&10@60%
Steady Ceiling Hooks.....50&10@60%
Belt.....80&15@80&20%
Atlas, Coat and Hat.....65%
Williamson's Bird Cage Hooks, List April, 1892.....40%
Bright Wire Goods—See Wire.

Miscellaneous—

Grass,No.2, $2.00; No.3, $2.10; No. 4, $2.25
Nolin's Grass.....℔ doz $2.25
Bush.....55@60%
Whiffletree—Patent.....55%
Hooks and Eyes—Malleable Iron. 70@70&10%
Hooks and Eyes—Brass.....60&10&10%
Fish Hooks, American.....50%
Bench Hooks—See Bench Stops.

Horse Nails—See *Nails, Horse*

Horse Shoes—

See *Shoes, Horse.*

Hose, Rubber—

Competition, Fair quality.....75@75&10%
Competition, Low Grade.....80@80&10
Standard.....70&10&70@10&5%
Extra.....60&10@60&10&10%
N. Y. B. & P. Co., Para.....25&5%
N. Y. B. & P. Co., Extra.....40&5@50%
N. Y. B. & P. Co., Dunbar.....60@60&5%
Cotton Garden, ¾ in., coupled:
Fair Quality, ℔ ℔.....7¢
Good Quality, ℔ ℔.....8½¢

Huskers—

Blair's Adjustable.....℔ gr $8.00
Blair's Adjustable Clipper.....℔ gr 7.00
Hubbard's Solid Steel.....℔ gr 4.50

Indurated Fiber Ware—

See *Ware, Indurated Fiber.*

Irons.

Sad—

From 4 to 10, at factory....℔ 100 ℔, $2.30@$2.40
Self-Heating.....℔ doz $8.00
Self-Heating Tailors'.....℔ doz $18.00
Mrs. Potts' Sad Irons, per set:

No.	50	55	60	65
Small lots.	.90	.85	1.05	.95

Crown.....60&10@60&10&5%
Ideal Irons, new list...50&10@50&10&10%
Salamander Irons.....25%
B. B. Sad Irons, ℔ ℔.....3@3¼¢
Chinese Laundry (N.E.Butt Co.).8½¢, 15%
New England.....5¢, 20@20&5%
Mahony's Troy Pol. Irons.....25%
Sensible, list Jan. 91.....50&10&5%
Sensible Tailor's Irons.....33⅓&5
National Self-Heating.....30%

Soldering—

Soldering Coppers.....℔ ℔ 19@21¢
Covert's Adjustable, list Jan. 1, 1886, 35&2%
Tinker's Dread..℔ doz $1.75; ℔ gro. $18

Pinking—

Pinking Irons, ℔ doz., 55@60¢.

Jack Screws—See *Screws.*

Jacks, Wagon—

Daisy.....33⅓&5
Victor.....33⅓&5
Lockport.....40%

Kettles—

Brass, Spun, Plain, list Jan. 1, '91..25&5%
Brass, Spun, Pld.W.M.list Jan. 1, '91..20%
Stamped Brass Kettles.....℔ ℔ 21¢
Enameled and Tea—See *Ware, Hollow.*

Keys—

Lock, Ass'n list Dec. 30, 1886..65&10@70%
Eagle, Cabinet, &c.....33⅓&2%
Hotchkiss' Brass Blanks.....40%
Hotchkiss' Copper and Tinned.....40%
Hotchkiss' Pad. and Cab.....35%
Wollensak Tinned.....50&10%

Knife Sharpeners—

See *Sharpeners, Knife.*

Knives—

Butcher, Shoe, &c.

Wilson's Butcher Knives, List Dec 8, 1890.....25%
Ames' Butcher Knives.....25%
Foster Bros.' Butcher, &c.....40%
Jordan's Aa A1 Butchers', list.....Net
Nichols' Butcher Knives.....40&10%
W. W. Wilson, Butcher, 6 in., $2.00; 7 in., $2.70; 8 in., $3.80, &c.
Ames' Shoe Knives.....20@25%
Ames' Bread Knives, ℔ doz $1.50, 15@20%
Moran's Shoe and Bread.....20@20&10%
Hay and Straw—See Hay Knives.
Table and Pocket—See Cutlery.

Corn—

Bradley's.....10%
Wadsworth's.....25@25&10%

Drawing—

Witherby.....
P., S. & W.....
Mix.....
New Haven.....
....75@75&10&5%
Merrill.....60&10@60&10&5%
Douglass.....75&75@5%
Watrous.....15&10@—%
L & I. J. White.....20&5
Bradley's.....5%
Adjustable Handle.....25@33⅓
Wilkinson's Folding.....25@25&5

Hay and Straw—

Lightning, from jobbers....$8.00@$9.00
Wadsworth's.....40&7½@40&10%
Carter's Needle...℔ doz. $11.00@$11.50
Heath's.....℔ doz. $13.00@$13.50
Nolin's Hay.....℔ dos. $7.00@$8.0

Mincing—

Am. (2d quality), ℔ gr., 1 blade, $7 2 blades, $12; 3 blades, $18.....net
Lothrop's.....20&10%
Smith's, ℔ dos., Single, $2; Double $3 45@50%
Knapp & Cowles.....50&10@60%
Buffalo Adjustable....℔ doz. $3.00, 33⅓&5

Knobs—

Door, Mineral.....60@65%
Door, Por. Jap'd.....70@75%
Door, Por. Nickel.....$2.00@$2.25
Door, Por. Plated Nicke..l....$2.00@$2.25
Drawer, Porcelain.....60@10@60&10&10%
Hemacite Door Knobs.....40&10@50%
Yale & Towne Wood, list Dec., 1885..40%
Base, Rubber Tip.....70&10&5%
Picture, Judd's.....60&10&10@70%
Picture, Sargent's.....70&10%
Picture, Hemacite.....35&5%
Shutter, Porcelain.....65&10%
Carriage, Jap.....℔ gro 80¢, 60&10%
Bardsley's Wood Door, Shutter, &c...15%

Ladders.

Davies Extension and Single.....20&5%

Ladies—

Melting, Sargents'.....60@60&5%
Melting, Reading.....35&10%
Melting, P., S. & W.....35&10@40%
Melting, Warner's.....30%

Lanterns—

Tubular—

Regular, with Guard.....℔ doz $3.50
O. K., with Guard.....℔ doz $3.75
Side Lift, with Guard.....℔ doz $4.00
Square Lift, with Guard.....℔ doz $4.25
Anti-Friction, with Guard.....℔ doz $4.50
Brass Plated, Sq. Lift, Guard.℔ doz $5.50
Cop. Plated, Sq. Lift, Guard..℔ doz $5.50

Bull's Eye Police—

2¾-inch regular.....℔ doz $3.00
3-inch regular.....℔ doz $3.00
2¾-inch flash light.....℔ doz $4.00
3-inch flash light.....℔ doz $4.50

Lawn Mowers—

See *Mowers, Lawn.*

Leaders, Cattle—

Humason, Beckley & Co.'s.....70%
Sargent's.....70@10@70&10&10%
Hotchkiss.....30%
Peck, Stow & W. Co.....60&10%

Lemon Squeezers—

See *Squeezers, Lemon.*

Lifters, Transom—

Wollensak's:
Class 3 and 4, Bronzed Iron.....60%
Class 3 and 4, Bronze Metal.....50%
Class 3 and 4, Brass.....50%
Skylight Lifters.....35%
Reiher's, list Feb. 20, 1891
Bronzed Iron Rods.....60@60&10%
Brass, Real Bronze or Nickel Plate..30%
Excelsior.....50&10&2%
Shaw's.....50&10%
Payson's:
Universal.....60%
Solid Grip.....60&10@60&10&10%
Imperial.....50&10%

Lines—

Cotton and Linen Fish.....50%
Chalk.....60%
Masons' Linen, 84 ft., No. 1, $1.25; No. 2, $1.75; No. 3, $2.25; No. 4,$2.75; No. 5, $3.25.....35%
Cotton Chalk.....55%
Samson Cotton, No. 4, $2; No. 4½, $2.50; 10%
Silver Lake, Braided No. 0, $6.00; No. 1, $6.50; No. 2, $7.00; No. 3, $7.50 ℔ gro.....35%
Mason's Linen, No. 3½, $1.50; No. 4, $2.00; No 4½, $2.50.
Mason's Colored Cotton.....45%
Wire Clothes..Nos. 18 19 20
100 ft.....$3.50 $3.00 $2.50
Ventilator Cord, Samson Braided, White or Drab Cotton..℔ doz $7.50..20%
Ossawan Mills, Chalk, Twisted, 60%; Chalk, Soft Braided, 50% Chalk, Braided, 25%.

Links, Open—

Terry's—per gro.:

Nos.	1	2	3	4
	$6.00	8.00	12.00	16.00

Locks, &c.—

Cabinet—

Eagle, Gaylord Parker and Corbin... List March, '84, rev. Jan. 1, '85.33⅓&2%
Deltz, Nos. 36 to 39.....40%
Deltz, Nos. 51 to 63.....40&10%
Deltz, Nos. 87 to 96.....30%
Champion Night Latches.....40%
Barnes Mfg. Co.....40@40&10%
Eagle and Corbin Trunk.....25&10
Champion Cab. and Combin.....33⅓&5
Yale.....net prices
Romer's.....20

Door, Locks, Latches, &c.—

R. & E. Mfg. Co., list Mar.20, 1889.....
Mallory, Wheeler & Co., list July, '88.....
Sargent & Co.,List Aug.1,'88
Branford Lock Works.....
....65&10@70% Much lower net prices often made

Brittan, Graham & Mathes, list Jan. 1890.....60&10&10%
Plate.....33⅓&2%
Barnes Mfg. Co.....40@40&10%
Yale.....net prices
Delta Flat Key.....36%
Romer's Night Latches.....15%
Brooklyn Latches.....50&10%
Warner's Burglar Proof. ℔ dos. $8.00, 50%

Elevator—

Moore's.....33⅓%

Padlocks—

List June 10, 1891.....50&2%
Norwich Lock Mfg. Co., old list.....50&2%
Yale Lock Mfg. Co.'s.....net prices
Eagle.....40%
Eureka, Eagle Lock Co.....40&2%
Romer's Nos. 0 to 91.....30%
omer's Scandinavian, &c., Nos. 100 to 505.....15%
A. E. Deltz.....40%
Champion Padlocks.....40%
Hotchkiss.....30%
Star.....60%
Horseshoe.....℔ doz $9, 50@50&10%
Barnes Mfg. Co.....40@40&10%
Nock's.....30%
Scandinavian.....90&40%
E. T. Fraim's Keystone Scandinavian, Nos. 119, 120, 130 and 140.....90&10%
Other Nos.....65%
Ames Sword Co. up to No. 150.....40%
Ames Sword Co. above No. 150.....50%
Slaymaker, Barry & Co.
No. 1010 line.....90&5%
No. 41 line.....50%
No. 61 line.....60%
No. 21 line.....80%

Sash, &c.—

Clark's No. 1, $10; No. 2, $8 ℔ gr.....33⅓%
Ferguson's.....33⅓%
Victor.....60&10&2%
Walker's.....10%
Attwell Mfg. Co.....25&33⅓%
Reading.....66⅔&10@66⅔&10&10%
Hammond's Window Springs.....40%
Common Sense, Jap'd, Cop'd and Br'zed.....℔ gr $4.00
Common Sense, Nickel Plated. ℔ gr $10.00
Universal.....30%
Kempshall's Gravity.....60%
Kempshall's Model.....60@60&10%
Corbin's Daisy, list Feb. 15, 1886.....70%
Payson's Perfect.....60&10&10%
Hugunin's Sash Balances.....25&5&2%
Hugunin's New Sash Locks.....25&5&2%
Ives Patent.....60&10&5@60&10&10%
Fish (Liesche's pat.), No. 100, ℔ gr., $8; No. 105, ℔ gr., $10.....50%
Davis, Bronze, Barnes Mfg. Co.....60%
Champion Safety list January, 1893.70&5%
Security.....70%
Giant, list Jan., 1892.....70&5%
Wolcott's.....60&10&5%
Monarch.....50%

Lumber Tools—

See *Tools, Lumber.*

Lustro—

Four-ounce bottles.....℔ doz, $1.75; ℔ gross.....$17.00

Machines.

Boring—

	Without Augers.	Upright.	Angular.
Douglas		$5.50	$6.75
Snell's, Rice's Pat...	5.50	6.75	40&10&10%
Jennings'	5.50	6.75	45&10%
Other Machines..	2.35	2.75	
Phillips' Patent with Augur	7.00	7.50	
Miller's Falls	7.50		25%

Boss, Carpenters' 3.60
Boss, Ship Bldrs'. 3.85

Fluting—

Knox, 4½-inch Rolls.....$3.25 each } 35%
Knox, 6-inch Rolls.....$3.60 each }
Eagle, 3½-inch Rolls, $2.15.....35%
Eagle, 5½-inch Rolls, $2.85.....35%
Crown, 4½ in., $3.50; 6 in., $4.00; 8 in., $6.50 each.....35%
Crown Jewel, 6 in.....$3.50 each, 35%
American, 5 in., $3.00; 6 in., $3.40; 7 in., $4.50 each.....35%
Domestic Fluter.....each, $1.50
Geneva Hand Fluter, White Metal, ℔ doz $12, 25%
Crown Hand Fluter, Nos. 1, $15.00; 2, $12.50; 3, $10.00; 4, $8.25.....30%
Shepard Hand Fluter, No. 85, per doz $15.50.....40%
Shepard Hand Fluter, No. 110, ℔ doz $11.00.....40%
Shepard Hand Fluter No. 95, ℔ doz $8.00.....40%
Combined Fluter and Sad Iron. ℔ doz $15.00.....30%

Hoisting—

Moore's Hand Hoist, with Lock Brake.20%
Moore's Anti-Friction Differential Pulley Block.....20%
Moore's Rope Differential Pulley Block.....60%
Energy Mfg. Co.'s.....25%
See also *Blocks.*

Washing—

Anthony Wayne, ℔ doz, No. 1, $42; No. 2, $36; No. 3, $42.
Wayne American.....℔ doz $33.00
Western Star ℔ doz, No. 2, $36; No. 3 $39.
Weisell.....℔ doz $54.00
Fair and Square.....℔ doz $42.00

Mallets—

Hickory.....20&10@20&10&10%
Lignumvitæ.....20&10@20&10&10%
S. & L. Block Co., Hickory & L. V. 30@30&10

Mattocks—Regular list, 60&10@60&10&5%

Measures—

Standard Fiberware, No. 1, peck ℔ dozen, $3.50; ½ peck, $3.00

Meat Cutters—

See *Cutters, Meat.*

Menders, Harness—

Per doz.....$2.00

Milk Cans—See *Cans, Milk.*

Mills—

Coffee—

Box and Side, List Jan. 1, 1888..60@60&5%
Net prices are often made which are lower than above discount.
American, Enterprise Mfg. Co., list Jan. 17, 1893.....20%
The Swift, Lane Bros.....30%
Waddel's New Box Mills, Ideal Brand, New List.....60%

Mincing Knives—

See *Knives, Mincing.*

Molasses Gates—

See *Gates, Molasses.*

Money Drawers—

See *Drawers, Money.*

Mowers, Lawn—

Best Machines: 10-in., $4; 12-in., $4.50; 14-in., $5; 16 in., $5.50; 18-in., $6.
Low-Grade Machines: 10-in. $3; 12-in., $3.25 14-in., $3.50 each

Muzzles—

Safety.....℔ doz, $3.00, 25%

Nails.—

Cut and Wire. See Trade Report.
Wire Nails, Papered.
Association list, May 1, '92.80&10&10&5%
Tack Mfrs.' list.....70&5@70&10%
Hungarian, Finishing, Upholsterers', &c. See *Tacks.*

Horse—

	Nos. 6	7	8	9	10	
American	9½	9½	9½	9½	9½	net
Ausable	28¢	26¢	25¢	24¢	23¢	40&5&2%
Clinton, Fin.	19¢	17¢	16¢	15¢	14¢	.30&5%
Essex	28¢	26¢	25¢	24¢	23¢	40&10@50%
Lyra	9½	9½	9½	9½	9½	net
Snowden	9½	9½	9½	9½	9½	net
Standard	23¢	21¢	20¢	19¢	18¢	35%
Vulcan	23¢	21¢	20¢	19¢	18¢	.25%
Northwest'n.	25¢	23¢	22¢	21¢	20¢	25@25&5%
A. C.	25¢	23¢	22¢	21¢	21¢	25&10@33⅓&5%
C. B. K.	25¢	23¢	22¢	21¢	21¢	33⅓@33⅓&10%
Maud S.	25¢	23¢	22¢	21¢	21¢	40&10&5%
Champlain	28¢	26¢	25¢	24¢	23¢	40&5&2%
Champion	25¢	23¢	22¢	21¢	20¢	10&10&10%
Capewell.	19¢	18¢	17¢	16¢	16¢	..10&5%
Anchor	23¢	21¢	20¢	19¢	18¢	35%
Western	23¢	21¢	20¢	19¢	18¢	50%
Empire Bronzed						15@14 ℔ ℔

Picture—

Brass Head, Sargent's list.....60@60&10%
Brass Head, Combination list.....50&10%
Porcelain Head, Sargent's list.50&10&10%
Porcelain Head, Combination list.40&10%
Niles' Patent.....40%

Nail Pullers—See *Pullers, Nail.*

Nail Sets—See *Sets, Nail.*

Nut Crackers—

See *Crackers, Nut.*

Nuts—List Dec. 18, 1889.

	Square.	Hex.
Hot Pressed	5.80¢	6.50¢ off list
Cold Punched	5.00¢	5.10¢ off list

In packages of 100 ℔, add 1-10¢ ℔ ℔, net; in packages less than 100 ℔, add ½¢ ℔ ℔, net.

Oakum—

Best or Government. . ....℔ ℔ 6¾@7¼¢
U. S. Navy.....℔ ℔ 5¾@6¢
Navy.....℔ ℔ 5¢@5¼¢

Oil Tanks—See *Tanks, Oil.*

Oilers—

Zinc and Tin.....65&10@70&5%
Brass and Copper.....50&10@50&10&5%
Malleable, Hammers' Improved, No. 1, $3.60; No. 2, $4.00; No. 3, $4.40 ℔ doz. 10@10&5%
Malleable, Hammers' Old Pattern, same list.....45%
Prior's Pat. or "Paragon" Zinc. 60&10&10%
Prior's Pat. or "Paragon" Brass.....50%
Olmstead's Tin and Zinc.....60%
Olmstead's Brass and Copper.....50%
Broughton's Zinc.....60%
Broughton's Brass.....50%
Steel, Draper & Williams.....50%

Openers, Can—

Messenger's Comet.....℔ doz $3.00, 25%
American.....℔ gross $2.75@$3.00
Duplex.....℔ doz 25¢, 15@20%
Lyman's.....℔ doz $3.75, 20%
No. 4, French.....℔ doz $2.25, 55@60%
No. 5, Iron Handle.....℔ gr $6.00, 45@50%
Eureka.....℔ doz $2.50, 10%
Sardine Scissors.....℔ doz $2.75@3.00
Star.....℔ doz $2.75
Sprague, No. 1, $2.00; 2, $2.25; 3, $2.50; 60&10@70%
Excelsior, No. 1 $2.50; No. 2, $1.50.....40%
World's Best ℔ gross, No. 1, $12.00; No. 2, $24.00; No. 3, $36.00.....50&10%
Universal, ℔ doz $3.00.....55&5%
Domestic, ℔ doz $2.00.....45%
Champion, ℔ doz $2.00.....50%
Moore's.....70%

Packing, Steam—

Rubber—

Standard.....70@70&10%
Extra.....60@60&5%
N. Y. B. & P. Co., Standard.....50%
N. Y. B. & P. Co., Empire.....60%
N. Y. B. & P. Co., Salamander.....25%
Jenkins' Standard, ℔ ℔ 80¢....25@25&5%

Miscellaneous—

American Packing.....10¢@11¢ ℔ ℔
Russia Packing.....14¢ ℔ ℔
Italian Packing.....13¢@14¢ ℔ ℔
Cotton Packing.....15¢@17¢ ℔ ℔
Jute.....7¢@8¢ ℔ ℔

Pails—

Creamery—

S. S. & Co.: 18-qt., $7.00; 20-qt., $7.25 per doz.....5%

Galvanized—

	Quarts 10	12	14
Hill's Light Weight, ℔ doz.	$2.75	3.00	3.25
Hill's Heavy Weight, ℔ dz.	3.00	3.25	3.75
Heiwig's	2.50	2.75	3.00
Sidney Shepard & Co.	2.50	2.75	3.00
Iron Clad	2.50	2.75	3.00
Fire Buckets	2.75	3.25	3.50

Buckets—See Well Buckets.

Indurated Fiber Ware—25%

Star Pails, 12 qt.....℔ doz $4.20
Milk, 14 qt.....℔ doz $5.40
Stable, 14 qu.....℔ doz $6.00
Fire Pails, deep.....℔ doz $4.80
Fire Pails, round bottom.....℔ doz $5.40

Standard Fiber Ware—

	Plain.	Decr'd
Water Pails, 12 qt., ℔ doz.	$3.15	$3.75
Dairy Pails, 14 qt., ℔ doz.	3.75	4.25
Fire Pails, No. 1, 12 qt., ℔ doz	3.75	
Fire Pails, No. 2, 14 qt., ℔ doz	4.25	
Sugar Pails	5.50	6.00
Horse Pails	4.50	
Buggy Pails	3.50	
Slop Jars (bal. trap)	7.50	8.50
Chamber Pails, 14 qt.	6.00	7.00

Pans—

Dripping—

Small sizes.....℔ ℔ 5½¢
Large sizes.....℔ ℔ 5¢
Silver & Co. (Covered).....40%

Fry—

Standard List:

No.	0	1	2	3	4
℔ doz.	$3.00	$3.75	$4.25	4.75	$5.25
No.		5	6	7	8
℔ doz.		$6.00	$7.00	$8.00	$9.00

Polished, regular goods.....75@75&10%
Acme Fry Pans.....66⅔%

Dust—

Steel Edge, No. 1.....℔ doz $1.75

Roasting and Baking—

Columbian, S. S. & Co.: Nos. 10, $2; 20, $2.25; 30, $2.50 each.....60&10%

Paper and Cloth—

Sand and Emery—

List April 19, 1886.... 50&10@50&10&10%
Sibley's Emery and Crocus Cloth.....30%

Parers—

Apple—

Advance.....℔ doz $4.75
Baldwin.....℔ doz 5.25
Bonanza.....each 5.00
Daisy.....℔ doz 4.00
Dandy.....each 7.50
Eclipse.....℔ doz 4.25
Eureka, 1888.....each 16.00
Family Bay State.....℔ doz 12.00
Favorite.....℔ doz 5.00
Gold Medal.....℔ doz 4.00
Ideal.....℔ doz 4.00
Improved Bay State....℔ doz 27.00@30.00
Little Star.....℔ doz 4.50
Monarch.....℔ doz 13.50
New Lightning.....℔ doz 5.50
Oriole.....℔ doz 4.00
Penn.....℔ doz 4.00
Perfection.....℔ doz 4.00
Pomona.....℔ doz 4.00
Rocking Table.....℔ doz 6.00
Turn Table.....℔ doz 4.50
Victor.....℔ doz 13.50
Waverly.....℔ doz 4.00
White Mountain.....℔ doz 4.00
72.....℔ doz 4.25
78.....℔ doz 7.00

Potato—

White Mountain.....℔ doz $4.50
Antrim Combination.....℔ doz $5.50
Hoosier.....℔ doz $13.50
Saratoga.....℔ doz $5.50

Pencils—

Faber's Carpenters'.....high list 50%
Faber's Round Gilt.....℔ gro $5.25
Dixon's Lead.....℔ gro $4.50
Dixon's Lumber.....℔ gro $6.75
Dixon's Carpenters'.....10%

Pencils, Soapstone—

See *Crayons.*

Pickers, Fruit—

Prize Fruit Pickers.....50%

Picks—

Railroad or Adze Eye, 5 to 6, $12.00; 6 to 7, $13.00.....60&10@60&10&10%

Picture Nails—

See *Nails, Picture.*

Pinking Irons—

See *Irons, Pinking.*

Pins—

Bow—

Humason, Beckley & Co.'s.....60&10%
Sargent & Co.'s, $17 and $18.....60&10%
Peck, Stow & W. Co....50&10@50&10&5%

Curtain—

Silvered Glass.....net
White Enamel.....net

Escutcheon—

Iron, list Nov. 11, 1885..50&10@50&10&5%
Brass.....60@60&5%

Pipe, Wrought Iron—

List April 13, 1893.

1¼ and under, Plain.....57½&10%
1¼ and under, Galv.....50&10%
1½ and over, Plain.....67½&10%
1½ and over, Galv.....57½&10%
Boiler Tubes, list Oct. 24, 1892.....65&10%
Casing, list Nov. 16, 1892.....52½&10%
Inserted Joints Casing, list Nov. 16, 1892.....47½&5%
Steel Boiler Tubes.....27½&5%
Cold Drawn Seamless Steel Tubing..50%

Planes and Plane Irons—

Wood Planes—

Molding.....40@40&10%
Bench, First quality.....45@45&10%
Bench, Second quality.....50@50&10%
Bailey's (Stanley R. & L. Co.) ..50&10%

Iron Planes—

Bailey's (Stanley R. & L. Co.).....50&10%
Miscellaneous Planes (Stanley R. & L. Co.).....25&10%
Steers' Iron Planes.....50@50&5%
Meriden Mal. Iron Co.'s.....50@50&5%
Davis' Iron Planes.....50@50&5%
Birmingham Plane Co.....60@60&5%
Gage Tool Co.'s Self-Setting...20&10&10%
Chaplin's Iron Planes.....50@50&5%
Sargent's.....60@60&10%
Standard Tool Co.....50@50&5%

Plane Irons—

Butcher's.....$5.00@$5.25 to
Buck Bros.....80

Auburn Thistle..... } .30&10@30&10&10%
Ohio..... }
Sandusky..... }
L. & I. J. White.....35%
Stanley R. & L. Co.....50&10%

Plates—

Felloe.....℔ ℔ 6¢@6½¢

Pliers and Nippers—

Button's Patent.....60%
Hall's No. 2, 5 in., $13.50; No. 4, 7 in., $21.00 ℔ doz.....40%
Humason & Beckley Mfg. Co..50@50&10%
Lindsay's Giant.....33⅓%
Gas Pliers.....60%
Gas Pliers, Custar's Nickel Plated..60&5%
Eureka Pliers and Nippers.....40%
Russell's Parallel.....35%
P., S. & W. Cast Steel.....50%
P., S. & W. Tinners' Cutting Nippers, add 6%.....10%
Carew's Pat. Wire Cutters.....20%
Morrill's Parallel, ℔ doz, $12.00....30&5%
Cronk's 5 in., $15.00; 10 in.....$20
Cronk's Button Pattern.....50&10@60%
Cronk's Carrier Pliers.....60@60&5%

Plumbs and Levels—

Regular List.....75&10@75&10&5%
Stanley's Duplex.....20&10%
Stanley's Handy.....20&10%
Disston's.....50%
Cook's.....40&10%
Pocket Levels.....70&10@70&10&10%
Davis Iron Levels.....30%
Davis Inclinometers.....10&10%

Poachers, Egg—

Buffalo Steam Egg Poachers, ℔ dos, No. 1, $6.00; No. 2, $9.00.....33⅓%
Silver & Co., 6-Ring, ℔ doz, $4.00; 8-Ring.....$2.00

Pokes, Animal—

Bishop s I. X. L.....℔ doz $6.00
Bishop's Monarch.....℔ doz $4.50
Bishop's Pioneer.....℔ doz $4.00
Bishop's American.....℔ doz $3.00
Eagle, Double Stale.....℔ doz $5.75
Eagle, Single Stale.....℔ doz $3.75
Buckeye, Single Stale.....℔ doz $2.75
Bolding.....℔ doz $6.00
Metallic Horse Poke.....℔ doz., $6.00

Police Goods—

R. I. Tool Co., Handcuffs, $15.00 ℔ dos 10%
R. I. Tool Co., Leg Irons, $25.00 ℔ dos 10%
Tower's.....35%
Daley's Improved Handcuffs; 2 Hands, Polished, ℔ doz, $48.00; Nickeled, $57.00; 3 hands, Polished, ℔ doz, $72.00; Nickeled, $84.00.....35%
J. P. Lovell's Police Goods.....35%

Polish—

Metal—

Prestoline.....30%
Prestoline Paste.....33⅓%
Gaston's Silver Compound.....33⅓%

Stove—

Joseph Dixon's.....℔ gro, $6.00, 10%
Gem.....℔ gro, $4.50, 10%
Gold Medal.....℔ gro, $6.00, 25%
Lustro.....℔ gro, $4.75
Ruby.....℔ gro, $3.75
Rising Sun, 5 gro lots.....℔ gro $5.50
Dixon's Plumbago.....℔ ℔ 8¢
Boynton's Noon Day.....℔ gro $13.00
Parlor Pride Stove Enamel, ℔ gro
Yates' Liquid, 2 3 5 10 gal ℔ gal...$0.80 .70 .60 .50
Yates Standard Paste Polish, 10 ℔ cans, ℔ ℔ 12½¢
Jet Black.....℔ gro $3.50
Japanese.....℔ gro $3.50
Fireside.....℔ gro $2.50
Diamond O. K. Enamel.....℔ gro $19.00
Bonnell's Liquid Stove Polish, ℔ gro $9.00
Bonnell's Paste Stove Polish, ℔ gro $6.00
Black Eagle Benzine Paste, 5 and 10 ℔ cans.....12½¢
Black Jack Water Paste, 5 and 10 ℔ cans.....12½¢
Nickel Plate Paste.....℔ gro $6.00
Crown Paste.....℔ gro $7.20
Crown Paste in 5 and 10 ℔ pails, ℔ ℔ 12¢
Black Flag.....℔ gro $7.20
Black Flag, 5 and 10 ℔ pails.....℔ ℔ 12¢
Black Flag, liquid, in bottles, ℔ gro $8.00
Diamond Rock Nickel Cleaner. ℔ gro $10.20
Raven Liquid, 6 oz. bottles..... ℔ gro $8.00
Raven Liquid, 8 oz. bottles.. ℔ gro $9.00
Raven Water Polish, large boxes.. ℔ gro $7.20
Raven Paste in 5 lb. pails (cases of ..... 6 pails), ℔ ℔ 10¢

Poppers, Corn—

Round or Square,
1 qt.....℔ doz $1.00; ℔ gr $8.00
1½ qt.....℔ doz $1.00; ℔ gr $9.00
2 qt.....℔ doz $1.50; ℔ gr $14.00

Post Hole and Tree Augers and Diggers—

See *Diggers, Post Hole, &c.*

Potato Parers—

See *Parers, Potato.*

Pots—

Glue—

Tinned.....40&10@40&10&5%
Enameled.....40&10@40&10&5%
Family, Howe's "Eureka".....40%
Family, L. F. C.'s "Handy".....50%

Powder—

In Canisters—

Fine Sporting, 1 ℔ each	0.90
Duck, 1 ℔ each	.60
Rifle, 1 ℔ each	.30
Rifle, ½ ℔ each	.18

In Kegs—

Rifle, 25-℔ kegs.....$3.50
Rifle, 12½ ℔ kegs..... 2.00
Rifle, 6¼ ℔ kegs..... 1.15
Duck, 25-℔ kegs..... 11.00
Duck, 12½-℔ kegs..... 5.75
Duck 6¼ ℔ kegs..... 3.00

Presses—

Fruit and Jelly—

Enterprise Mfg. Co.....25%
Jenis.....℔ doz $3.50
Shepard's Queen City.....40%
Silver & Co.....℔ doz $2.75

Pruning Hooks and Shears—See *Shears.*

Pullers, Nail—
Scranton ..... ₩ doz., $18.00, 33⅓%
Giant, No. 1 ..... ₩ doz., $18.00, 10%
Giant, No. 2 ..... ₩ doz., $15.00, 10%
Pelican ..... ₩ doz., $9.00, 25%
Eclipse ..... Each, $2.00, net
Economy ..... ₩ doz., $6.00

Pulleys—
Hot House, Awning, &c. ..... 60%@70%
Japanned Screw ..... 60&10&10%
Brass Screw 70%
Japanned Slide ..... 60&10&10%
Moore's Side, Anti Friction 50%
Moore's Sliding or End, Anti Friction 40%
Moore's Dumb Waiter, Anti-Friction 50%
Moore's Electric Light 33⅓%
Japanned Clothes Line ..... 60&10%
Hay Fork, Solid Eye, $4.00; Swivel, $4.50 ..... 50&10&50&10&5%
Hay Fork, "Anti-Friction," 5 in. solid, $5.70 ..... 50%
Hay Fork, "F" Common and Patent Bushed 20%
Hay Fork, Tarbox Pat. Iron 20%
Hay Fork, Reed's Self-Lubricating 60%
Hay Fork, Moore's Anti-Friction 5 in. Wheel, ₩ doz., $12.00 ..... 40%
Shade Rack 45%
Tackle Blocks—See Blocks.
Shepard's Niagara, No. 25. ₩ doz 23¢ net
Sash (Auger Mortise).
Common Sense 60%
Empire 60%
Ideal, Nos. 2, 4, 10 & 15 } 30% less 1¢ ₩
Acme } doz net.
Star }
On bbl. lots extra 5%.
Ideal, Nos. 25 and 55. .. ₩ doz. 22¢ net.

Pumps—
Cistern, Best Makers ..... 60@60&10%
Pitcher Spout, Best Makers ..... 67½@70%
Pitcher Spout, Cheaper G'ds .. 75@75&10%

Punches—
Saddler's or Drive, good .. ₩ doz., 60@65%
Bemis & Call Co.'s Cast Steel Drive. 50&5%
Bemis & Call Co.'s Springfield Socket .. 65%
Spring, good quality .. ₩ doz., $2.50@$2.60
Spring, Leach's Pat 15%
Bemis & Call Co.'s Spring ..... 50&5%
Bemis & Call Co.'s Check 55%
Solid Tinners', P., S. & W. Co., ₩ doz., $1.44 ..... 55%
Tinners' Hollow Punches, P., S. & W. Co ..... 20&2%
Rice Hand Punches 15%
Avery's Revolving 40%
Avery's Sawset and Punch—See Sawsets
Niagara Hollow Punches ..... 20&2%
Niagara Solid Punches 55%

Rail—
Sliding Door, Wr't Brass .... ₩ ℔, 35¢, 40%
Sliding Door, Bronzed Wr't Iron .. ₩ ft., 7¢
Sliding Door, Iron, Painted .. ₩ ft., 4¢, 40%
Barn Door, Light .. In. ½ ⅝ ¾
Per 100 feet $2.00 2.50 3.10, 10%
B. D. for N. E. Hangers—
Small. Med. Large.
Per 100 feet ..... $3.15 2.70 3.25 Net
Terry's Steel Rail ..... ₩ ft., 4½¢
Victor Track Rail, 7¢ ₩ foot ..... 50&2%
Carrier, double braced, Steel Rail, ₩ foot ..... 3½@4¢
Lundy Parlor Door, Planed Edge, ₩ ft. 7¢
Moore's Steel Rail ..... 25&10%
Moody Steel Rail ₩ ft., 5¢ 45%

Rakes—
Cast Steel, Association g'ds .. 70@70&5&2%
Cast Steel, outside g'ds ..... 70@70&5&2%
Malleable ..... 70@70&5%
Gibbs' Lawn Rake ..... ₩ doz., $4.90
Gibbs' Canton Lawn Rake .. ₩ doz., $3.75
Gibbs' Acme Lawn Rake .... ₩ doz., $4.75
Gibbs' Favorite Lawn Rake .. ₩ doz., $3.90
Gibbs' Crown Lawn Rake, No. 1 ..... ₩ doz., $4.90; No. 2, $5.40
Oneida Lawn Rake ..... ₩ doz., $6.00
Fort Madison Prize Bow Brace and Peerless 65%
Fort Madison Steel Tooth Lawn Rake, $3.00 ..... 25%

Razors—
J. R. Torrey Razor Co 20%
Wostenholm and Butcher, $10 to $2 .... 10%
Jordan's AAA1, new list ..... Net
Jordan's Old Faithful, new list ..... Net
Galvanic ..... ₩ doz., $15.00
Electric Cutlery Co ..... Net
Campbell Cutlery Co 50%

Razor Strops—
See *Strops, Razor.*

Registers —
Moore's Japanned 75%
Moore's Electroplated 75%
Moore's Bronze Finishes 70%
Moore's Solid Bronze 65%
Moore's Stove Pipe 33⅓

Rings and Ringers—
Bull Rings—
Union Nut Co 55%
Sargent's ..... 75&10%
Hopkins' low list 30%
Humason, Beckley & Co.'s ..... 70&10%
Peck, Stow & W. Co.'s .. 50&10@50&10&10%
Ellrich Hdw. Co., White Metal, low list. 50@50&10%

Hog—
Top of the Hill Ringers ..... ₩ doz $2.00
Top of the Hill Rings ..... ₩ doz $1.25
Hill's Improved Ringers ..... ₩ doz $1.25
Hill's Old Style Ringers ..... ₩ doz $1.12½
Hill's Tongs ..... ₩ doz $3.00
Hill's Rings ..... ₩ doz bxs $1.00
Perfect Rings ..... ₩ doz bxs $1.50
Perfect Ringers ..... ₩ doz $2.15@$2.25
Blair's Hog Ringers ..... ₩ doz $2.00
Blair's Hog Rings ..... ₩ doz 90@$1.00
Champion Ringers ..... ₩ doz $2.00
Champion Rings, Double ..... ₩ doz $2.25
Brown's Ringers ..... ₩ doz $2.00
Brown's Rings ..... ₩ doz $1.15@$1.25
Electric Hog Rings ..... ₩ doz boxes $1.50
Electric Hog Ringers ..... ₩ doz $2.00
Major Rings ..... ₩ doz $1.25
Major Ringers ..... ₩ doz $2.00

Rivets and Burrs—
Norway Iron list Nov. 17, '87 .... 60&10%
Second quality 70%
Copper ..... 60@60&10%
Coppered Iron, Bettina Brand ..... 50&5%

Rivet Sets—See *Sets.*

Roasting and Baking Pans—See *Pans, Roasting and Baking.*

Rods—
Stair, Brass ..... 25@30%
Stair, Black Walnut ..... ₩ doz 40¢

Rollers—
Barn Door, Sargent's list. .... 60&10&10%
Acme Moore's Anti Friction. 55%
Upton Barn Door Roller 70%
Moore's Barn Door Stay 50%
Thompson Mfg. Co.'s Lawn Rollers .. 30%

Rope—The following prices are f.o.b., New York or factory, and are shaded ¼¢@½¢ on large lots; terms, 1½% for cash.
Manila, 7-16 in. diam. and larger ₩ ℔ 8¾¢
Manila ..... ¾ in. ₩ ℔ 9¼¢
Manila ..... ¼ and 5-16 in. ₩ ℔ 9¾¢
Manila, Tarred Rope ..... ₩ ℔ 8¾¢
Manila, Hay Rope ..... ₩ ℔ 8¾¢
Sisal ..... 7-16 inch and larger ₩ ℔ 7¼¢
Sisal ..... ⅜ in. ₩ ℔ 8 ¢
Sisal ..... ¼ and 5-16 in. ₩ ℔ 8½¢
Sisal, Hay Rope ..... ₩ ℔ 7½¢
Sisal, Tarred Rope ..... ₩ ℔ 7 ¢
Sisal, Medium Lath Yarn ..... ₩ ℔ 7 ¢
New Zealand .. 7-16 in. & larger ₩ ℔ 7 ¢
New Zealand ..... ¾ inch, ₩ ℔ 7¼¢
New Zealand .. ¼ and 5-16 inch, ₩ ℔ 7¾¢
New Zealand, Hay Rope ..... ₩ ℔ 6¾¢
New Zealand, Tarred Rope ..... ₩ ℔ 6½¢
Cotton Rope ..... ₩ ℔ 13½@16¢
Jute Rope ..... ₩ ℔ 6½@7¢

Wire—
List February, 1892. All kinds 45%

Rules—
Boxwood ..... 80&10&10@80&10&10&10%
Ivory ..... 50&10%
Starrett's Steel Rules and Straight Edges ..... 25&10%

Sad Irons—See *Irons, Sad.*

Sand and Emery Paper and Cloth—
See *Paper and Cloth.*

Sash Cord—See *Cord, Sash.*

Sash Locks—*See Locks, Sash.*

Sash Weights—
See *Weights, Sash.*

Sausage Stuffers or Fillers—See *Stuffers or Fillers, Sausage.*

Saws—
Disston's Circular ..... 45@45&5%
Disston's Cross Cut, list Jan. 1, '93. 40&10%
Disston's Hand 25%
Woodrough & McFarlin.
Hand, Panel and Rip ..... 25&10%
Cross Cuts, list Jan. 1, 1893 ..... 45&10%
Wheeler, Madden & Clemson Mfg. Co.
Hand, Panel and Rip ..... 30&10%
Cross Cuts, list Jan. 1, 1893 ..... 45&10%
Atkins' Circular ..... 50&10%
Atkins' Cross Cuts, new list 40%
Atkins' Mulay, Mill and Drag ..... 50&10%
Atkins' One-Man Saw 40%
Atkins' Wood Saws 40%
Peace Circular and Mill ..... 45@45&5%
Peace Hand Panel and Rip ..... 25@25&5%
Peace Cross Cuts, list Jan. 1, '93 .. 45&10%
Richardson's Circular and Mill. 45@45&5%
Richardson's X Cuts, list Jan. 1, '93. 45&10%
Richardson's Hand, &c ..... 25@25&5%
C. E. Jennings & Co.'s 25%

Hack Saws—
Griffin's, complete ..... 40&10@50
Griffin's Hack Saw Blades ..... 40&10@50
Star Hack Saws and Blades 25%
Eureka and Crescent 25%

Scroll—
Lester, complete, $10.00 .... 25%
Rogers, complete, $4.00 ..... 25%
Barnes' Builders' and Cab Makers' $15, 25%
Barnes' Scroll Saw Blades 35%

Saw Frames—
See *Frames, Saw.*

Saw Sets—See *Sets, Saw.*

Saw Tools—See *Tools, Saw.*

Scales—
Hatch, Counter, No. 171, good quality, ₩ doz $18.00@$19.00
Hatch, Tea, No. 161 .... ₩ doz $6.50@$7.00
Union Platform, Plain ..... $2.10@2.20
Union Platform, Striped ..... $2.40@2.50
Chatillon's Grocers' Trip Scales 50%
Chatillon's Eureka 25%
Chatillon's Favorite 40%
Family, Turnbulls ..... 30@30&10
Riehle Bros.' Platform 40%

Scale Beams—
See *Beams, Scale.*

Scissors, Fluting 45%

Scrapers—
Adjustable Box Scraper (S. R. & L. Co.) $6.00 ..... 30&10%
Box, 1 Handle ..... ₩ doz $2.25@$2.50
Box, 2 Handle ..... ₩ doz $3.00@$3.25
Defiance Box and Ship .... 20&10%
Foot ..... 50&10&60%
Ship, Common ..... ₩ doz $3.50 net
Ship, R. I. Tool Co 10%

Screen Window and Door Frames—See *Frames*

Screw Drivers—
See *Drivers, Screw*

Screws—
Bench and Hand—
Bench, Iron ..... 55&10@55&10&10%
Bench, Wood, Beech ..... ₩ doz $2.25
Bench, Wood, Hickory ..... 20&10%
Hand, Wood ..... 25&10@25&10&5%
Hand, Grand Rapids, list 35%

Coach, Lag and Hand-Rail—
Lag, Blunt Point, list Jan. 1, 1890 ..... 80@80&10%
Coach and Lag, Gimlet Point, list Jan. 1, 1890 ..... 80@80&5%
Hand Rail, Sargent's ..... 70&10%
Hand Rail, H. & B. Mfg ..... 70&10@75%
Hand Rail, Am. Screw 75%

Jack Screws—
Jack Screws, Millers Falls list. 50@50&10%
Jack Screws, P., S. & W 35%
Jack Screws, Sargent 70%
Jack Screws, Stearns' ..... 40@40&10%

Cork—
Humason & Beckley Mfg. Co. 40&10@50%
Williamson's ..... 33⅓@33⅓&5%
Detroit Cork Screw Co 33⅓%

Machine—
Flat Head Iron 65%
Round Head Iron 60%

Wood—
List January 1, 1891.
Flat Head Iron ..... 70% } Extra 10 or 10& 10% often given.
Round Head Iron 65%
Flat Head Brass 70%
Round Head Brass 65%
Flat Head Bronze 70%
Round Head, Bronze 65%
Rogers' Drive Screws ..... 82½&5%

Scroll Saws—See *Saws, Scroll.*

Scythes—
Grain ..... 40&5@40&10%
Grass ..... 40&10&50%

Scythe Snaths—
See *Snaths, Scythe.*

Sets—
Awl and Tool—
Aiken's Sets, Awls and Tools, No. 20, ₩ doz $10.00 .... 60@60&5%
Fray's Adj. Tool Hdls., Nos. 1, $12; 2, $18; 3, $12; 4, $9 ..... 45%
Millers Falls Adj. Tool Hdls., Nos. 1, $12; 2, $18 ..... 25%
Henry's Combination Haft ... ₩ doz $6.50
Stanley's Excelsior:
No. 1, $7.50; No. 2, $4.00; No. 3, $5.50 ..... 30&10%
Common Brad Sets, No. 42, $10.50; No. 43, $12.50 .. 70&10&5%

Nail—
Square ..... ₩ gr. $4.00@$4.25
Round ..... ₩ gr. $3.25
Buck Bros 27½%
Cannon's Diamond Point ... ₩ gr. $12, 20%

Rivet—
Regular list 70%

Saw—
Stillman's Genuine .... ₩ doz $5.00@7.75, 40&5%
Stillman's Pattern, Hand, ₩ doz $3.25; Cross Cut, $6.50 ..... 55@55&10%
Common Lever ..... ₩ doz $2.00, 45@50%
Morrill's No. 1, $15.00 ..... 40&20%
No. 11, $16.00 ..... 40&20%
Nos. 3 and 4, Cross Cut, $23.00 .. 40&20%
No. 5, Mill, $31.00 ..... 40&20%
No. 10, $15.50 ..... 40&20%
Leach's .. No. 0, $8.00; No. 1, $15 .. 15@20%
Nash's ..... 20&10@20&10&10
Hammer, Hotchkiss $5.50, 10%
Hammer, Bemis & Call Co.'s new Pat. 45%
Bemis & Call Spring Hammer ..... 30&5%
Bemis & Call Co.'s Plate 20%
Bemis & Call Co.'s Cross Cut ..... 30&5%
Aiken's Genuine ..... $13.00, 55@55&10%
Aiken's Imitation ..... $9.00, 55@55&10%
Hart's Pat. Lever 20%
Disston's Star 25%
Leopold ..... 40&10@50%
Atkin's Lever ..... ₩ doz No. 1, $6.00
Atkin's Criterion ..... ₩ doz No. 1, $6.00
Croissant (Keller), No. 1, $15.00; No. 2, $24.00 ..... 40&10@50%
Avery's Saw Set and Punch 50%
Kohler's Royal ..... ₩ doz $7.00
Kohler's Giant Royal ..... ₩ doz $12.00
Crescent ..... ₩ doz $3.00
Lloyd's Acme ..... ₩ doz $15, 40&10%
Taintor Positive ..... ₩ doz $18, 50%

Sharpeners, Knife—
Larkins'.
Applewood Handles ... ₩ doz. $6.00, 40%
Rosewood or Cocobola. ₩ doz. $9.00 40%

Shaves, Spoke—
Iron 45%
Wood 30%
Bailey's (Stanley R. & L. Co.) ..... 40&10%
Stearns' ..... 30&10%
Cincinnati ..... 25&10%
Goodell's ₩ doz. $9.00 ..... 25%

Shears—
American (Cast) Iron .. 75&10@75&10&5%
Barnard's Lamp Trimmers .. ₩ doz. $3.75
Seymour's, List Dec. 1881. 60&10&10@60&10&10&5%
Heinisch's, List Dec. 1881. 60&10&10@60&10&10&5
Heinisch's Tailor's Shears 33⅓%
Cast Steel Trimmers:
First quality ..... 80@80&10%
Second quality ..... 30&10@80&10&10%
Acme Cast Shears ..... 10&10%
Diamond Cast Shears 10%
Clipper ..... 10&10%
Victor Cast Shears ..... 75&10@75&10&5%
Howe Bros. & Hulbert, Solid Forged Steel 40%
Hatch Cutlery Co., Solid Steel Forged. 60%
Davenport Cutlery Co ..... 60@60&10%
Clauss brand, Japanned 70%
Clauss brand, Nickeled, same list 60%
Galvanic 3½ to 9 in., ₩ doz. $1.00 ₩ inch
Electric Cutlery Co ..... Net
Campbell Cutlery Co., Jap'd 75%
Nickel Plated 65%

Tinners' Snips—
Wrt. Handles, Steel Blades .. 20@20&10%
Niagara Snips and Shears. .... 20&10%
Cast Handles, Laid with Steel 40%

Pruning Shears and Hooks
Disston's Combined Pruning Hook and Saw ..... ₩ doz. $18.00, 20&10%
Disston's Pruning Hook, ₩ doz. $12.00 20&10%
E. S. Lee & Co.'s Pruning Tools. 50&10@70%
Pruning Shears, Henry's Pat., ₩ doz. $3.75@$4.00
Henry's Pruning Shears, ₩ doz. $4.25 @$4.50
Wheeler, M. & C. Co., Combination, ₩ doz $12.00
Dunlap's Saw and Chisel, ₩ doz $8.50, 30%
J. Mallinson & Co., No. 1, $5.25; No. 2, $7.25
P., S. & W. Co 30%
Levin Pruner No. 1, $15.00 ₩ doz. 40&35%
Levin Pruner No. 2, $21.00 ₩ doz .. 40&5%

Tinners', &c.—
Shears and Snips (P. S. & W.) ..... 20@25%
Snips, J. Mallinson & Co 33⅓%

Sheaves—
Sliding Door—
M. W. Co., list July, 1888 .... 50&10@60&5%
R. & E., list Dec. 18, 1885 ..... 55&20%
Corbin's list ..... 60&10&5%
Patent Roller ..... 60&10&5%
Patent Roller, Hatfield's 75%
Russell's Anti-Friction, list Dec. 18, 1885 ..... 60&5%
Moore's Anti-Friction 50%

Sliding Shutter—
R. & E., list Dec. 18, 1885 ..... 60&10&5%
Sargent's list 70%
Reading list ..... 60&10&10%

Shells—
First quality 4, 8, 10 and 12 gauge 25&10&5%
First quality Rival, Club and Climax brands, 14, 16 and 20 gauge ($7.50 list) ..... 20&10&5%
Prize ..... 40&10%
Star, Club, Rival and Climax Brands ... 33⅓&10&5%
Smokeless brand, 12, 10, 16 gauge. 33⅓&10&5%
Trap brand, 12 and 10 gauge .. 33⅓&10&5%
Selbold's Comb. Shot Shells ..... 15&5%
Brass Shot Shells, 1st quality ..... 60&5%
Brass Shot Shells, Club, Rival, Climax. 65&5%

Shells, Loaded—
Standard List, July 19, 1890 ..... 40&10&10@40&10&5% 5 7% cash, 10 day s.

Ship Tools—
L. & I. J. White ..... 20&5%

Shoes, Horse, Mule, &c.—
Horse—
Burden's, Perkins', Phœnix, Standard, Diamond State, Bryden's Boss and Crescent, at factory $4.00
Bryden's Frog Pressure, at factory .. $5.00

Mule—
Add $1 ₩ keg to above prices.

Ox Wrought—
Ton lots ..... ₩ ℔ 9¢
1000 ℔ lots ..... ₩ ℔ 9½¢
500 ℔ lots ..... ₩ ℔ 10¢

Shot—
	Small lots.	In ton lots at 4½ discount of 5% (95 lbs.) is made.
Drop, up to B, 25-℔ bag	$1.45	
Drop, up to B, 5-℔ bag	.35	
Drop, B and larger, 25-℔ bag	1.70	
Drop, B and larger, 5-℔ bag	.40	
Buck and Chilled, 25-℔ bag	1.70	
Buck and Chilled, 5-℔ bag	.40	
Dust Shot, 25-℔ bag	2.00	
Dust Shot, 5-℔ bag	.45	

Shovels and Spades—
Ames' Shovels, Spades, &c., list Nov. 1, 1885 ..... 30%
NOTE.—Jobbers frequently give 5@7½% extra on above.
Griffith's Black Iron ..... 50&10%
Griffith's C. S ..... 60@60&5%
Griffith's Solid C. S. R. R. Goods 20%
St. Louis Shovel Co ..... 20@20&7½%
Hussey, Binns & Co ..... 15@25%
Hubbard & Co .... 20@20&7½%
Lehigh Mfg. Co ..... 50&10%
H. M. Myers Co 30%
Payne Pettebone & Son ..... 33⅓&5%
Remington's (Lowman's Pat.) 40&10&50%
Rowland's Black Iron .. 60&10@50&10&5%
Rowland's Steel ..... 60&5@60&10%
Terra Haute Shovel & 25%

Shovels and Tongs—
Iron Head ..... 60&10@60&10&5%
Brass Head ..... 60&10&10%

Sieves and Sifters—
Mann's Tin Rim ..... 50&25%
Buffalo Metallic, S. S. & Co .. 50&25&20%
Shaker (Barler's Pat.) Flour Sifters ₩ gr $21.00
Electric Light .. ₩ doz $1.50; ₩ gro $15.00
A. & W. Sifters ..... ₩ gr $15.00
Hunter's Genuine. ₩ doz $1.75, ₩ gr $16.50
Hunter's Imitation ..... ₩ doz $1.75; ₩ gr $15.00

Sieves, Wooden Rim
	Iron	Plated
Mesh 18, Nested, ₩ doz.	$0.80	$1.00
Mesh 20, Nested, ₩ doz.	.95	1.10
Mesh 24, Nested, ₩ doz.	1.15	1.25

Sinks, Wrought Steel—
Columbus, Painted or Unpainted ..... 30@30&10 %
Columbus, Galvanized and Enameled. 50@50&10 %
New Era, Painted ..... 40&10@50&5 %
New Era, Galvanized and Enameled .. 60&10&10@70&5 %

Skeins, Thimble—
Western list ..... 75&5@75&10%
Columbus Wrt. Steel. Special net prices
Coldbrookdale Iron Co 50%
Seneca Falls Pattern 60%
Utica P. S. T. Skeins 50%
Utica Turned and Fitted 35%

Slates—
School, by case ..... 40&10@50%
Large lots ..... 50&10&10%

Slaw Cutters—See *Cutters.*

Sleds Hand—
Tubular Steel ..... ₩ doz $24.00 40&50
Lots of 6 doz 50%

Snaps, Harness, &c.—

Anchor (T. & S. Mfg. Co.)....65%
Fitch's (Bristol)....50&10%
Hotchkiss....10%
Andrews....50%
Sargent's Patent Guarded....70&10&10%
German, new list....40&10%
Covert....50&10&5&2%
Covert, New Patent....50&10&5&2%
Covert, New R. E....60&10&5&2%
Covered Spring....60&10&10%
Covert's Saddlery Works' Triumph.33⅓&5
John Protz Snaps....75a75&5%
Kelley & Woolworth's Steel Harness....50&10@60%

Snaths—

Scythe....50&2@50&5&2%

Soldering Irons—

See *irons, Soldering.*

Spittoons, Cuspidors, &c.

Standard Fiberware—

Cuspidors, 8½-inch, ₩ doz., No. 5, $8; No. 5X, $9.
Spittoons, Daisy, 8-inch, No. 1, 4; 10 and 11 inch, $6.

Spoke Shaves—

See *Shaves, Spoke.*

Spoke Trimmers—

See *Trimmers, Spoke.*

Spoons and Forks—

Tinned Iron—

Basting, Cen. Stamp. Co.'s list....70&10%
Solid Table and Tea, Cen. Stamp. Co.'s list....70&10%
Buffalo, S. S. & Co....33⅓&2%

Silver Plated—

4 months or 5% cash 30 days:
Meriden Brit. Co., Rogers....40&15%
C. Rogers & Bros....40&15%
Rogers & Bros....40&15%
Reed & Barton....40@40&5%
Wm. Rogers Mfg. Co....40, 15&5%
Simpson, Hall, Miller & Co....40, 15&5%
Holmes & Edwards Silver Co....40, 15&5%
L. Boardman & Son....60&12½%

Miscellaneous—

Holmes & Edwards Silver Co.:
No. 67 Mexican Silver....50&10&5%
No. 30 Silver Metal....50&10&5%
No. 24 German Silver....50&10&5%
No. 50 Nickel Silver....50&5%
No. 49 Nickel Silver....50&10&5%
Wm. Rogers Mfg. Co.:
Rogers' Silver Metal....50&10&6%
18% Rogers' German Silver....60&6%
22% Rogers' Nickel Silver....50&6%
German Silver....50@50&5%
German Silver, Hall & Elton..50&5% cash
Nickel Silver....50&5@50&10&5% cash
Brittannia....60@60&5%
Boardman's Nickel Silver, list July 1, 1891....60&7½&5%
Boardman's Brittannia Spoons, case lots....60&5% cash

Springs—

Door—

Torrey's Rod, 39 in....₩ doz $1.20@1.2
Warner's No. 1, ₩ doz $1.50; No. 2, $3.40....55@55&10%
Gem (Coil), list April 19, 1886....20%
Star (Coil), list April 19, 1886....20&10%
Victor (Coil)....60&10@60&10&5%
Champion (Coil)....60&10@60&10&10%
Gowell's, No. 1, ₩ doz $18.00; No. 2, $15.00....50@50&10%
Rubber, complete, ₩ doz $4.50....55&10%
Hercules....50@50&10%
Phœnix....33⅓&5

Carriage, Wagon, &c.—

Elliptic, Concord, Platform and Half Scroll....60&10@60&10&10&10 or net prices
Cliff's Bolster Springs....25%

Squares—

Steel and Iron, Nickel-Plated....80&10&10@80&25%
Try Square and T Bevels....60&10&10%
Disston's Try Square and T Bevels....50%
Winterbottom's Try and Miter....30&10%
Starrett's Micrometer Caliper Squares....25%
Avery's Flush Bevel Squares....40%
Avery's Bevel Protractor....50%

Squeezers—

Fodder—

Blair's....₩ doz $2.00
Blair's "Climax"....₩ doz $1.25

Lemon—

Porcelain Lined, No. 1....₩ doz $6.00....25&30%
Wood, No. 2....₩ doz $3.00, 35%
Wood, Common....₩ doz $1.70@1.75
Dunlap's Improved....₩ doz $3.75, 20%
Sammis....No. 1, $5,00; No. 2, $9; 12, $18 ₩ doz....25&10%
Jennings' Star....₩ doz $2.50
The Boss....₩ doz $2.50
Dean's..Nos. 1, ₩ doz $6.50; 2, $3.35; 3, $1.90; Queen, $2.50
Little Giant....50@50&5%
King....40&5%
Hotchkiss Straight Flash....₩ doz $12.00
Silver & Co., Glass....₩ gro. $9.00

Standard Fiber Ware—

See *Ware, Standard Fiber.*

Staples—

Barbed Blind, ½ in. and larger. ₩ ℔ 7@7½¢
Barbed Blind, ¾ in....₩ ℔ 8@8½¢
Fence Staples, Galvanised. } Same price as B'rb Wire
Fence Staples Plain. } See Trd. Rep
Grand Crossing Tack Co.'s list....75&10%

Steelyards....40&10@50%

Stocks and Dies—

Blacksmith's:
Waterford Goods....35%
Butterfield's Goods....35%
Lightning Screw Plate....25@30%
Reece's New Screw Plates....25@30%
Reversible Ratchet....30%
Gardner....25%
Green River....25@30%

Stops, Bench—

Morrill's, ₩ doz. No. 1, $10.00; No. 2, $11.00....40&20%
Hotchkiss's....₩ doz $5, 10@10&10%
Weston's, No. 1 @ No. 2, $9, 25&10&5

McGill's, ₩ doz $3....10
Cincinnati....25&10
Terrell's Nos. 1 and 2, ₩ doz., $3; No. 3, $3.60....30%
Millers Falls....25%
Stearns'....20&10%

Stone—

Stones, Grind—See *Grindstones.*

Scythe Stones—

Pike Mfg. Co., list April, 1892....33⅓%
Cleveland Stone Co., list Nov. 1892..33⅓%

Oil Stones, &c.—

Pike Mfg. Co:
Hindostan No. 1, ₩ ℔....8¢
Sand Stone....5¢
Turkey Oil Stone, 4 to 8 in....80¢
Turkey Slips....$2.00
} 40 @ 40& 10%
Lily White Washita....60¢
Rosy Red Washita....60¢
Washita Stone, Extra....50¢
Washita Stone, No. 1....40¢
Washita Stone, No. 2....30¢
Lily White Slips....90¢
Rosy Red Slips....90¢
Washita Slips, Extra....80¢
Washita Slips, No. 1....70¢
Arkansas Stone, No. 1, 3 to 5½ in., $2.80
Arkansas Stone, No. 1 5½ to 8 in., $3.50
} 33⅓@33⅓&10%
Lake Superior....₩ ℔ 13¢
Lake Superior Slips....₩ ℔ 20¢

Stove Polish—

See *Polish, Stove.*

Stretchers Carpet—

Cast Steel, Polished....₩ doz $2.2
Cast Iron, Steel Points....₩ doz 75@80¢
Socket....₩ doz $1.75
Bullard's....25@25&10%

Strops, Razor—

Genuine Emerson....60@60&5%
Imitation " ..₩ doz $2.00, 20&10&5%
Torrey's....20%
Badger's Belt and Com....₩ doz $2.00
Lamont Combination....₩ doz $4.00
Jordan's Pat. Padded, list Nov. 1, '89, 50%
Electric Cutlery Co....Net
Campbell Cutlery Co....Net

Stuffer, Sausage—

Miles' Challenge, ₩ doz $20....50@50&5%
Perry....₩ doz, No. 1, $15.00; No. 0, $21.00....50&5@50&10%
Draw Cut No. 4, each $30.00....20%
Enterprise Mfg. Co., list Jan 17, '93..25%
Silver's....40&10%

Sweepers, Carpet and Lawn—

Carpet—

Bissell No. 5....₩ doz $17.00
Bissell No. 8....₩ doz $20.00
Bissell, Grand....₩ doz $36.00
Standard....₩ doz $24.00
Domestic....₩ doz $21.00
Domestic, No. 2....₩ doz $22.00
Grand Rapids....₩ doz $24.00
Crown Jewel, No. 1, $18.00; No. 2, $19.00; No. 3, $20.00
Magic....₩ doz $15.00
Improved Parlor Queen, Nickeled....₩ doz $27.00
Japanned....₩ doz $24.00
Excelsior....₩ doz $22.00
Garland....₩ doz $18.00
Parlor Queen....₩ doz $24.00
Housewife's Delight....₩ doz $15.00
Ladies' Friend....₩ doz $15.00
Ladies' Friend No. 2....₩ doz $16.00
Advance....₩ doz $18.00
Our Leader....₩ doz $19.00
Triumph....₩ doz $20.00
Goshen....₩ doz $21.00
Supreme....₩ doz $22.00
Easy....₩ doz $22.00
Gilt Edge....₩ doz $24.00
Acme....₩ doz $26.00
Imperial....₩ doz $26.00
Grand Republic....₩ doz $30.00
Banner....₩ doz $22.00
The Star....₩ doz $21.00
Reliable....₩ doz $22.00
The Rapid....₩ doz $22.00
Our Own....₩ doz $27.00
Model....₩ doz $27.00

Goshen Sweeper Company, Grand Rapids, Mich., make the following rebates:
5 dozen in 6 months....₩ doz $1.00
10 dozen in 6 months....₩ doz $2.00
25 dozen in 6 months....₩ doz $3.00
Except on L.F., when 10 dozen price is $13.50, and 25 dozen $13.00.

Lawn—

Thompson Mfg. Co....30%

Swings—

Davies Lawn....25%

Tacks, Brads &c.—

List October 19, 1889. Old established straight Weights. Short Weight goods are sold at lower prices.

Carpet Tacks—
American, Blued....66⅔%
American, Tin'd and Cop'd....70%
Steel, Bright and Blued....66⅔%
Steel, Tinned and Coppered....70%
Swedes Iron, Blued....72½%
Swedes Iron, Tinned....75%
American Iron Tacks, Domestic.66⅔%
Swedes Iron Tacks—
S. S., Blued....66⅔%
S. S., Tinned....70%
Lanc., Blued....55%
Lanc., Tinned....60%
Gimp and Lace Tacks—
S. S., Blued....62½%
S. S., Tinned....66⅔%
Lanc., Blued....55%
Lanc., Tinned....60%
Basket and Trimmers' Tacks—
Lanc....52½%
S. S....55%
Hungarian Nails....60%
Common and Patent Brads....55%
Leathered Tacks....10%
Brush Tacks, S. S....60%
Looking Glass Tacks, S. S....35%
Picture-Frame Points, S. S....35%
Finishing Nails....60%
Trunk and Clout Nails—
Black....65%
Tinned or Coppered....67½%
Basket Nails....60%
Chair Nails....52½%
Cigar Box Nails....45%
Tin Capped Nails....50%

} Extra discount 25&2%

Miscellaneous—

Double Point....90@90&10%
Wire Carpet Nails....50&10%
Claw Handle Carpet....₩ gross $4.00
Bonnie Blue....₩ box 1.50
Bill Nye Brad Box....4 00
Parisian Gilt Nails, cartoon....50
Home Tacks, No. 50 ₩ case (12 cartons), $36.00; No. 100, ₩ case (12 cartons), $72.00.
Home Nails, No. 200, ₩ case (12 cartons), $30.00; No. 400, ₩ case (12 cartons), $60.00.
} 50&2%
Upholsterers' Nails....50&10%

Wire Brads and Nails

Steel-Wire Brads, R. & E. Mfg. Co.'s list 50&10%

See also *Nails, Wire.*

Tanks, Oil—

Emerald, S. S. & Co.: 30-gal. $8.75; 60-gal., $11 each....50&10&5%

Tapes, Measuring—

American....40@40&5%
Spring....40%
Chesterman's, Regular list....25@30%

Thermometers—

Tin Case....80@80&10%

Thimble Skeins—See *Skeins.*

Ties, Bale—Steel.

Standard Wire, list....50&10&5%

Tinners' Shears, &c.—

See *Shears, Tinners' &c.*

Tinware—

Stamped, Japanned and Pieced, list Jan 20, 1887....70&10@70&25%

Tire Benders, Upsetters, &c.—See *Benders and Upsetters, Tire.*

Tobacco Cutters—

See *Cutters, Tobacco.*

Tools—

Coopers'—

Bradley's....20%
Barton's....20@20&5%
L. & I. J. White....20&5%
Albertson Mfg. Co....25%
Beatty's....30%
Sandusky Tool Co....30@30&5%
Shaves Cincinnati Tool Co....20%

Lumber—

Ring Peavies, "Blue Line"..₩ doz $20.00
Ring Peavies, Common....₩ doz $18.00
Steel Socket Peavies....₩ doz $21.00
Mall. Iron Socket Peavies...₩ doz $19.00
Cant Hooks, "blue Line"....₩ doz $16.00
Cant Hooks, Common Finish..₩ doz$14.00
Cant Hooks, Mall. Socket Clasp, "Blue Line" Finish....$16.00
Cant Hooks, Mall. Socket Clasp, Common Finish....₩ doz $14.50
Cant Hooks, Clip Clasp, "Blue Line" Finish....₩ doz $14.00
Cant Hooks, Clip Clasp, Common Finish....₩ doz $12.00
Hand Spikes....₩ doz 6 ft., $15.00; 8 ft., $20.00

Pike Poles, Pike & Hook, ₩ doz, 12 ft., $11.50; 14 ft., $12.50; 16 ft., $14.50; 18 ft., $17.50; 20 ft., $21.50.
Pike Poles, Pike only, ₩ doz, 12 ft., $10.00; 14 ft., $11.00; 16 ft., $13.00; 18 ft., $16.00; 20 ft., $20.00.
Pike Poles, not ironed, ₩ doz, 12 ft., $6.00; 14 ft., $7.00; 16 ft., $9.00; 18 ft., $12.00; 20 ft., $16.00.
Setting Poles, ₩ doz, 12 ft., $14.00; 14 ft., $15.00; 16 ft., $17.00.
Swamp Hooks....₩ doz $18.00

Saw—

Atkins', new list....40%

Transom Lifters—

See *Lifters, Transom.*

Traps—

Game—

Newhouse....40@40&5%
Oneida Pattern....70&10%
Game, Blake's Patent....40&10&5%

Mouse and Rat—

Mouse Wood, Choker, ₩ doz holes, 9@10¢
Mouse, Round Wire....₩ doz $1.50 10%
Mouse, Cage, Wire....₩ doz $2.50 10%
Mouse, Catch-'em-alive..₩ doz $2.50 15%
Mouse, Bonanza....₩ doz 0.90@$1.00
Rat, Decoy....₩ gr $10.00, 10%
Ideal....₩ gr $10.00
Cyclone....₩ gr $5.25
Hotchkiss Metallic Mouse, 5-hole traps, ₩ doz., 75¢; in full cases, ₩ doz.60@65¢
Hotchkiss Imp. Rat Killer...₩ gro $18.50
Hotchkiss New Rat Killer...₩ gro $16.50
Schuyler's Rat Killer....₩ gro $15.00
Dandy....₩ doz., $1.75
Waddel's Go Bang, ₩ gro....$12.50

Fly—

Harper, Champion or Paragon....₩ doz. $1.75, ₩ gro. $16.50
Balloon, Globe or Acme....₩ doz. $1.50, ₩ gro. $13.50

Triers—

Butter and Cheese....25%

Trimmers, Spoke—

Bonney's....₩ doz $10.00, 50%
Stearns'....20&10%
Ives', No. 1, $15.00; No. 2, $12.00 ₩ doz. 55&10%
Douglas'....₩ doz $9.00, 20%
Cincinnati....25%

Trowels—

Lothrop's Brick and Plastering....20&10&5@35%
Reed's Brick and Plastering....15%
Disston's Br'k and Plastering.25@25&10%
Peace's Plastering....25@25&5%
Clement & Maynard's....20@20&5%
Rose's Brick....15@20%
Brade's Brick....25%
Worrall's Brick and Plastering....20%
Garden....70%
Cleves' Angle Trowel, ₩ gro, No. 1, $36; No. 2, $30; No. 3, $15. net @ 10%

Trucks, Warehouse, &c.—

B. & L. Block Co.'s list....40%
Thompson Mfg. Co....40%
Barnes' Barrel Trucks....40%

Tubes. Boiler—

See Pipe

Twine—

Flax Twine—

	BC.	H.
No. 9, ¼ and ⅛ ℔ Balls	26¢	31¢
No. 12, ¼ and ⅛ ℔ Balls	22¢	30¢
No. 18, ¼ and ⅛ ℔ Balls	20¢	29¢
No. 24, ¼ and ⅛ ℔ Balls	20¢	29¢
No. 36, ¼ and ⅛ ℔ Balls	18¢	28¢

No. 284 Mattrass, ¼ and ⅛ ℔ Balls, 52@54¢
Chalk Line, Cotton, ⅛ ℔ Balls....25¢
Mason Line, Linen, ⅛ ℔ Balls....55¢
2-Ply Hemp, ¼ and ⅛ ℔ Balls (Spring Twine)....15-½¢
3-Ply Hemp, 1 ℔ Balls....16¢@16½¢
3-Ply Hemp, 1½ ℔ Balls....15¢@15½¢
Cotton Wrapping, 5 Balls to ℔..15¢@18¢
2, 3, 4 and 5 Ply Jute, ⅛ ℔ Balls....10¢
Wool....6½¢@6½¢
Paper....13¢@14¢
Cotton Mops, 6, 9, 12 and 15 ₩ to doz..18¢

Vises—

Solid Box....50&10@60%

Parallel—

Fisher & Norris Double Screw....15&10%
Stephens'....25@30%
Parker's....20@25%
Wilson's....55%
Howard's....40%
Bonney's....50%
Millers' Falls....40@40&10%
Trenton....40&5@40&10%
Merrill's....15@20%
Hollands'....35@40%
Sargent's....70&10%
Backus and Union....40%
Double Screw Leg....15&10%
Prentiss....20@25%
Simpson's Adjustable....40%
Moore's....20%
Massey Quick Action....20@25%

Saw Filers—

Bonney's, Nos. 2 & 3, $15.00....40&10@50
Stearn's....33⅓&10@33⅓&10&10%
Stearn's Silent Saw Vises....33⅓&35%
Hopkins'....₩ doz $17.50, 10%
Reading....40&10%
Wentworth....20&10%
Economy, ₩ doz., Nos. 110, $10.00; 120, $15.00....50&10&10&5%

Miscellaneous—

Phœnix Vises....33⅓%
Phœnix Hand Vises....₩ doz $3.60, 33⅓%
Cowell Hand Vises....20%
Bauer's Pipe Vises....10%
Cincinnati....25&10%
Enterprise Pipe Vises....each $3.00, 40%
Massey Combination Pipe Vise....40%

Wads—Price Per M.

U.M.C.&W.R.A.—B. E., 11 up..68¢
U.M.C.&W.R.A.—B. E., 9&10..82¢
U.M.C.&W.R.A.—B. E., 8....96¢
U.M.C.&W.R.A.—B. E., 7....$1.10
U.M.C.&W.R.A.—P. E., 11 up. 1.15
U.M.C.&W.R.A—P. E., 9&10.. 1.50
U.M.C.&W.R.A—P. E., 8..... 1.70
U.M.C.&W.R.A—P. E., 7..... 1.80
Eley's B. E., 11 and larger....$1.70@$1.75
Eley's P. E., 12 to 20....3.00@ 3.2
} Dis. 30&5%

Wagon Boxes—

See *Boxes, Wagon.*

Wagon Jacks—

See *Jacks, Wagon.*

Ware, Hollow—

Cast Iron, Hollow—

Stove Hollow-Ware—
Ground....60&10@60&10&10%
Unground....65&10@70&5%
White Enameled Ware—
Maslin Kettles....70&10@75%
Boilers and Saucepans....60@60&5%
Tinned Boilers and S'pans....60@60&5%
Russ ess Hollow Ware....50@50&5%
Gray Enameled Ware—
Stove....50%
Maslin Kettles....60&60&10%
Boilers and Saucepans....40&5%

Enameled—

Agate and Granite Ware, list Jan. 1, 1889....33⅓%
Ironclad Enameled Ware....dis 33⅓&10%
} Extra 10% on some leading articles.

Kettles—

Galvanized Tea-Kettles—

Inch.....	6	7	8	9
Each....	55¢	60¢	65¢	75¢

Standard Fiber—

	Per Doz. Plain.	Decorated.
Wash-Basins, 10½ in....	$1.80	2 00
Wash-Basins, 12 in.....	2.00	2.50
Keelers, 11¼ in.....		3.50
Cuspidors.....		7.50
Spittoons, "Daisy," 8 in.	3.50	4.00
Peck Measure.....	3.50	
Half-peck Measure.....	3.00	

See also Pails.

Indurated Fiber.—

Spittoons No. 2, ₩ doz....$6.00
Basins, Ringed, ₩ doz., No. 2....2.80
Washtubs, Nested, Nos. 0, 1, 2 and 3 (4 pieces), ₩ nest....$5.75
Keelers Nested, Nos. 1, 2, 3 and 4 (4 pieces), ₩ nest....$2.55
Butter Bowls 15, 17 and 19-inch (3 pieces), ₩ nest....$1.50
Liquid Measures, pt., qt., 2 qt. and funnell (4 pieces), ₩ set....$1.20
} 40&5&5%
See also Pails.

Silver Plated, Hollow—

4 mo. or 5% cash in 30 days.
Reed & Barton....
Meriden Britannia Co....
Simpson, Hall, Miller & Co....
Rogers & Brother....
Hartford Silver Plate Co....
William Rogers Mfg. Co....
} 40&5&5%

Washers—

Size hole.....	5-16	⅜	½	⅝	to 1¾
Washers.....	5½	4½	3½	2¾	

In lots less than 200 ₩, ₩ ℔, add ½¢, 5-2 boxes 1¢ to list.

Washer Cutters—

See *Cutters, Washers.*

Water Coolers—

See *Coolers, Water.*

Wedges—

Iron....₩ ℔ 3½¢
Steel....₩ ℔ 5½¢

Weights, Sash—

Solid Eyes....₩ ton $18.00@$19.00

Well Buckets Galvanized—See *Buckets, Well, Galvanized.*

Wheels Well—

8 in., $2.00 10 in. $2.50 12 in $3.7

Whips

American Whip Co.: Length.	4½	5	5½	6	6½	7	7½	8 ft.
X. L. Whalebone Driving...	$18.00	20.00	22.00	24.00	27.00	30.00	33.00	36.00
Eureka, Two-thirds Whalebone.	....	....	15.00	16.50	18.00	20.00	....	....
Bull Bone, Half-length Whalebone.	....	....	11.00	12.00	13.00	15.00	....	....
American Standard	8.00	8.50	9.50	10.50	12.00	13.50	15.00	16.50
True Grip, Raw Hide Center....	6.00	6.00	6.50	7.00	7.50	9.00	....	....
New Name, Stocked Java, Black and Wine Colors	....	....	....	6.00	....	....	....	....
Americus, 93 Pen Whip	....	....	....	6.00	....	....	....	....
Gents' Light Driving No. 111...	....	....	....	6.00	....	....	....	....
Gents' Light Driving No. 106...	....	....	....	5.00	....	....	....	....
Hand-made Stocked Java No. 103	....	....	3.75	4.00	....	....	....	....

Per dozen.

A large variety of cheaper grades.....50¢@$3.00
Team Whips.....$2.00@$7.50
Toy Whips.....₩ gro. $2.50@$12.00
Hardware Assortment, 10/American, 75 Whips for $50.00.

Wire and Wire Goods—

Iron—

Market,

Br. & Ann., Nos. 0 to 18, 75&10@75&10&5%
Cop'd, Nos. 0 to 18. 75&5%
Galv., Nos. 0 to 18.... 70&5@70&10%
Tin'd, Tin'd list, Nos. 0 to 18.....70@70&10%

Extra 5@10% often given and net prices often made on large lots.

Stone,
Br. and Ann'd,
Nos. 16 to 18.... ....80%
Nos. 19 to 26.... ..80&5%
Nos. 27 to 36 ...82½&5%
Extra 10% often given.
Tinned Broom Wire, 18 to 21, ₩ ℔....4½¢
Galvanized Fence .....75&10%
Brass, list Jan. 18, 1884. .....40&5%
Copper, list Jan. 18, 1884.....40@5%
Annealed Wire on Spools 60%
Malin's An'aled & Tin'd on Spools..60&5%
Malin's Brass and Cop. on Spools...50&5%
Ossawan Mills, An'ld and Tinned on Spools.....60&10%
Ossawan Mills, Brass and Copper on Spools.....50&10%
Tate's Spooled, Tin'd & Annealed..60&5%
Tate's Spooled Cop. and Brass 50%
Cast Steel Wire 50%
Stubs' Steel Wire.....$6.00 to £, 30%
Steel Music Wire, 12 to 30, imported.... 60@70¢ ₩ ℔
Wire Clothes Line, see Lines.
Wire Picture Cord, see Cord.

Bright Wire Goods—

Standard list.....85@85&10%

Wire Cloth and Netting—

Painted Screen Cloth ₩ 100 ft. $1.75@$2.00
Galvanized Wire Netting.....75@75&10%

Wire Barb—

See Trade Report.

Wire Rope—See *Rope. Wire.*

Wrenches—

American Adjustable 40%
Baxter's Adjustable "S".....40&10@50%
Baxter's Diagonal.....30%
Coes' Genuine .....50@50&10%
Coes' "Mechanics'".....50&10&3%
Girard Standard.....65&10@70%
Lamson & Sessions' Engineers'....60&10%
Lamson & Sessions' Standard.....70&10%
P. S. & W. Agricultural.....
Girard Agricultural.....
Lamson & Sessions' Agric'l..
W. & B. Diamond.....
75&10@80%

Bemis & Call's:
Pat. Combination Bright .....40&5%
Pat. Combination Black.....40 & 10%
Merrick's Pattern.....45%
Brigg s Pattern.....30&10%
Cylinder or Gas Pipe.....45&5%
No. 3 Pipe 55%
Aiken's Pocket (Bright).....$6.00, 50&10%
The Favorite Pocket.....₩ doz., $4.00, 40%
Webster's Pat. Combination.....25%
Boardman's 30%
Always Ready.....25&5%
Alligator.....50%
Donohue's Engineer.....20&10%
Eagle.....50&10%
Acme, Bright.....50&2%
Acme, Nickeled.....40&2%
Hercules.....70@70&5%
Walker's.....55&2%
Diamond Steel.....55&5%
Cincinnati Brace Wrenches.....25&10%
Tafts Vise Wrench.....55&10&5%

Wringers, Clothes—

Am. Wringer Co.'s list, July 1, '93..2% cash
Colby Wringer Co., list Sept. 1, '91..2% cash
Lovell Mfg. Co., list July 1, 1892..2% cash
Peerless Mfg. Co., list Feb., 1892..2% cash
National Wringer & Mfg. Co., list June 1, 1892.....2% Cash

Wrought Goods—

Staples, Hooks, &c., list March 17, 1891 85&10@85&10

News and Notes.

A larger proportion of customs duties at New York have recently been paid in gold coin than at any time since April, 1883.

A dispatch from Ottawa states that the figures of Canada's export trade for the fiscal year ending June 30, 1893, have just been compiled, and show that the exports exceed those of the previous year by $1,250,000, and are the greatest on record, aggregating $115,187,666. In 1892 the export trade amounted to $113,963,375, and in 1891 to $98,417,296.

Croton water will, experimentally, be purified by an electrolyzing process recently tested by the Health Board. Serious complaints have recently been made by New York residents of the quality of the city's water supply.

A New York syndicate have, it is said, secured control of the cork trade through the country by the combination of the five largest cork works.

A small species of worm has made its appearance in the Northwest which is reported to be destroying whole tracts of forest trees in some of the heaviest timbered districts of Washington State.

Failures among farmers in Great Britain for the first half of the year were 40 per cent. over those of the corresponding months of last year. The agricultural depression is said to be unprecedented. Thousands of unemployed farm laborers are hovering in the outskirts of London, and more than 16,000 persons engaged in agriculture are living in sheds, barns, tents, vans or the open fields.

Political and financial troubles in South and Central America have, it is said, prevented the expected flow of visitors from those countries to the World's Fair. Steamship agents state that there has been practically no increase of travel from the South and Central American States to this country this year, although every inducement has been offered to tourists and the fair widely advertised.

A financial novelty has been started on the Kootenai Lake, British Columbia. It is a floating bank which goes round in a steamer and transacts business by turn at the various towns on the lake, none of which are large enough to support such an institution single-handed.

The New York, New England and Northern Railroad was incorporated this week, with a capital of $3,000,000. A. A. Macleod is understood to be the controlling spirit of the undertaking.

A serious scarcity of vessels for carrying California wheat exists at San Francisco. Wheat freights have consequently made a decided advance. The increased demand for tonnage is occasioned by the wheat growers disposing of their crops immediately after they are harvested, the banks refusing to advance them money on warehouse receipts.

Indictments have been made at Portland, Ore., against 15 persons, 8 of them being ex-Federal officials, for smuggling opium and Chinese laborers into the Washington and Puget Sound districts.

W. R. Lawson of the London *Financial Times*, who has just completed a somewhat extensive tour through the Southern States, is reported as saying: "I am going back to England with quite a cheerful feeling in regard to Southern roads. In fact, I think the South looks as though it would be the most prosperous part of the country this year. Iron industries are bad, but almost everything else looks well. The truck farming has increased enormously since I visited the South last. It is becoming a great source of revenue for both the people and the railroads."

Estimates for this year's Delaware peach crop put the probable yield at over 5,500,000 baskets. This will be by far the heaviest crop known within the last 25 years.

Dr. Wheeler, who was sent by the Treasury Department to Europe to inspect the sanitary condition of the more important seaports of the Continent, and to inquire into the arrangements for shipping immigrants, has returned to this country. He reports that the sanitary condition of the cities visited, namely, Hamburg, Bremen, Rotterdam, Antwerp, Marseilles and Naples, is far better than was the case last year. Every precaution is, he says, being taken to prevent the approach of cholera and to hold it in check in the event of its appearance.

The long distance telephone lines between London and Paris have almost superseded the telegraph as a means of communication between the stock exchanges of the two cities.

The Mexican Congress has authorized the Executive Department for the next five years to make contracts granting franchises and concessions to companies that guarantee the employment of capital in the establishment and development of new industries in the republic, upon certain conditions, among the principal of which are that the minimum capital to be invested must be $250,000 and that concessionaires must guarantee their compliance with the contracts by making deposits in bonds of the public debt. The duration of franchises will be graduated according to the importance of the industry, but will in no case exceed ten years. The capital will be exempt from all federal taxation, and the concessionaires will be permitted to import, once only, free of duty, the machinery, apparatus, tools, construction materials and other necessaries for their factories and buildings.

The drought in Northern Mexico has had the effect of causing the owners of haciendas to turn their attention seriously to the subject of irrigation.

In striking contrast to her big neighbor—Australia—New Zealand has been enjoying a year of unbroken prosperity. The colony has had no boom, but an extremely profitable trade has been steadily and surely growing up for the past five years. Business has been uninjured by the bank crashes in Australia, and it is said that deposits in the New Zealand banks are as safe as if in the Bank of England. The outlook is regarded as very bright for a steady growth of progress and prosperity.

The prompt issue of consular reports on trade and commercial subjects is a feature of the State Department which is much appreciated by manufacturers and exporters.

President Diaz is credited with the intention of inaugurating forthwith some radical economies in the administration of Mexico, prominent among them being a material reduction in the standing army of the republic.

Renewed activity is observed in the old oil fields in West Virginia.

The Canadian Pacific Railway Company contemplate the employment of electricity in drawing trains up Kicking Horse Canyon.

An ocean race of 15,000 miles, for a purse of $5000 in gold, between three big ships engaged in the carrying trade, commenced on July 28 from Philadelphia. The vessels are all English, and each carry 125,000 cases of petroleum, their destination being Calcutta.

Governor Lewelling of Kansas has started a project for opening up direct trade relations between Kansas and other Western States and European seaports by way of the Gulf of Mexico.

THE METAL WORKER.

NEW YORK AND CHICAGO.

Saturday, August 12, 1893.

DAVID WILLIAMS, - PUBLISHER

BUSINESS OFFICES:

NEW YORK.....96-102 Reade Street.
PHILADELPHIA.....220 South Fourth Street.
BOSTON.....146 Franklin Street.
PITTSBURGH..... Room 509 Hamilton Building.
CHICAGO.....59 Dearborn Street, cor. Randolph.
CINCINNATI.....Rooms 22-24 Pickering Building.
ST. LOUIS.....Bank of Commerce Building.
CLEVELAND.....312 The Cuyahoga.

BRITISH AGENCY: The Ironmonger, 42 Cannon street, London, England.

Stove Repairs.

Already the dealers in stove repairs, as well as the stove manufacturers, can detect unmistakable signs of a large demand in this direction. The last winter played no unimportant part in creating this demand, as its severity taxed all kinds of domestic heating and cooking apparatus beyond what is usual, and left them in no fit condition to do service under similar conditions. Another important factor is the prevailing idea that money will be more scarce before it is more plenty, and instead of expending the sum necessary for a new stove, a tithe of it will be spent on necessary repairs. Following the same line of thought brings up the old question of stove construction, which frequently a correspondent will notice by saying that little consideration is given by the maker to the man who repairs a stove. Bolts and nuts are placed out of sight and out of convenient reach. As a result there is trouble over the price charged for a few small castings which have taken a considerable time to put in place. It is useless to worry over this question, and the proper thing for the repair man to do is to provide a complete set of tools and devices to enable him to surmount his difficulties quickly.

Misrepresenting Industries.

It is a pity that reputable journals should, for party ends, resort to methods which, to say the least, must be characterized as disingenuous. Statements have recently appeared in partisan newspapers in regard to the condition and prospects of certain manufacturing industries which appear to have been deliberately designed to produce a misleading and injurious impression on the minds of those who are not well acquainted with the real state of the matter. These questionable tactics have of late been very freely used by the opponents of the American tin-plate industry, who have let slip no opportunity of disseminating and enlarging upon any items of intelligence, or even mere rumors, in connection with domestic tin-plate works, which may be calculated to discredit the industry with the general public. The strenuous and honest efforts which have been made by home manufacturers to build it up have been not only ignored but in many cases willfully misrepresented and doubts thrown on their integrity. Stoppages of works for the usual summer repairs, or on account of the heat, or temporary suspension of production caused by the general dullness of trade, have been greedily seized upon by certain papers and magnified into failures and embarrassments.

A Case in Point.

Quite recently the New York *Evening Post* printed a long article purporting to show the evil effect of the McKinley tariff upon the tin box trade of Brooklyn. The condition and prospects of three of the principal concerns manufacturing tin boxes in that city were given—ostensibly from information afforded by members of those firms—as being quite seriously depressed and gloomy, owing to the tax on tin plates. One of these concerns was the well-known firm of Somers Brothers, of whom it was said that they had attempted the manufacture of sheet tin last year, but gave it up two weeks ago. As a matter of fact the works have been running most successfully up to a short time ago, when they were closed down temporarily for the usual annual overhaul, and also because of the general dullness of trade in all its branches, rendering a short rest from production desirable, and especially so during the heated term. So far from relinquishing the manufacture of tin plate, the Somerton Tin Plate Works will be started full again on September 1.

Eccentric Architecture.

Building is a matter in which eccentricity is very apt to show itself on the part of individuals who are otherwise supposed to be in complete possession of their senses. Instances are numerous in ancient and modern history in which persons have set to work to build odd dwelling houses, or other erections, embodying some extraordinary ideas of their own, in design, construction, or decoration. Occasionally the thing is done purely for notoriety, but more often it is the outcome of some mental kink on the builder's part. Such objects are, in fact, usually the work of "cranks." The late Duke of Portland, one of the wealthiest of English peers, was a remarkable case in point. This individual expended immense sums and gratified his mental twist—for he was undoubtedly insane on this point—in the construction of a great suit of subterranean chambers and galleries in his beautiful estate of Welbeck Abbey. The work included magnificently appointed stables for some hundreds of horses, and a vast riding school, the whole being illuminated by gas. Why he should have wanted to burrow underground when he had hundreds of broad acres on which to build, and a splendid old mansion above ground, no one but himself could tell. But there the excavations remain to this day, a monument of wasted time, labor, and treasure—of no earthly use or advantage.

A Steel and Glass Palace.

The latest thing in architectural oddities, however, is announced as being in course of construction in this country in the shape of a mansion constructed almost exclusively of steel and glass, which is to cost, not counting the decorations, the sum of $1,500,000. According to accounts given in the press a retired diamond mine owner from South Africa, said to be worth $25,000,000, has purchased a 500-acre tract in the Temescal district of California, where he purposes erecting for himself a lordly pleasure house which is not to contain a foot of timber or wood in any shape, and in which even the use of stone is to be restricted to a few marble and onyx sculptures and decorations. The material to be used will be iron, steel, aluminum, brass, bronze, copper, platinum, silver, glass, concrete and cement, the foundations being of steel and concrete. The building, as described in an architectural journal, will be about 230 feet long by about 100 feet wide. At one end it will be surmounted by a tower 115 feet high, at the other end by a similar tower, but of lesser size and hight. A striking feature will be the sides below the cornice, which slope to the ground with a curve at an angle of about 45°. In the sloping sides are set huge oval windows 12 feet long and made to conform to the line of the sides or walls. The roof will be a huge gable extending the entire length of the building and terminating in another gable at right angles, in which are placed immense stained glass windows, one of which will be 50 feet long and 30 feet wide. The roof is to be made of copper and the walls or sides of comparatively thin steel sheets. One would think this building would be intolerably hot in summer weather, while hail storms, which are not infrequent in that part of the country, would play havoc with the glass and cause a lively rattling on the metal roof and sides. On the whole, we should think a good old-fashioned frame house, costing but a small fraction of the sum mentioned for this mansion, would give a better return in solid comfort. Perhaps, however, the builder may be a crank on the subject of fires, in which case he might feel more at ease in such a thoroughly fireproof fabric.

THE LETTER BOX.

How to Line a Tank.

From J. J. B., *Philadelphia.*—I have read the letter of "B. H. T.," about lining a tank and your answer, and if he follows your method, I think, from his experience, taking his letter for my authority, you will give him more than he can handle. I have had considerable experience in that line as man and boss, and I will give him my method, and if he follows it he will have an easy thing. Get out his copper of sufficient hight to allow enough to turn over and nail on top and turn flange of 1½ inches on bottom. Form four corners square and turn edges same as for grooving; then get out copper for sides; edge and groove together, hooked in will answer (same as flat seam roofing), and don't be afraid of a hot iron or solder. For that size tank I would make copper ½ inch smaller than tank. He had better get out a strip and nail two right angle strips on ends, exact size of tank, for a gauge. Turn his 1½-inch edge on bottom. When he has it in tank turn ½-inch edge with tongs and put the bottom in, same as flat-seam roofing. He will have to notch top and bottom only one place so that sides and bottom will be brought together and allow it to slip in tank easily. If he follows that method and don't get it in his head that he has a big job, he is all right. Want of confidence is very often the cause of making easy work hard, and many failures. It is only one day's work for man and helper.

Cleaning Wipe Joints.

From SUBSCRIBER, *Santa Rosa, Cal.*—Will *The Metal Worker* please inform me of the best process for cleaning wipe joints after they have become soiled in stock?

Note.—If any of our readers have any better way than brightening them with fine sandpaper we will be glad to print their suggestions.

Area of a Circular or Elliptical Roof.

From D. L. W., *Madalin, N. Y.*—How is the area of a roof to be obtained that is either circular or elliptical in shape?

Answer—The area of a circle can be obtained by the use of any of the following rules:

Multiply the circumference by one-half the radius; or, by one-fourth the diameter.

Square the circumference (that is, multiply the circumference by itself), and divide by 12.56.

To obtain the circumference, use any of the following rules:

Multiply the diameter by 22 and divide by 7.

Or, multiply the diameter by 3.1416.

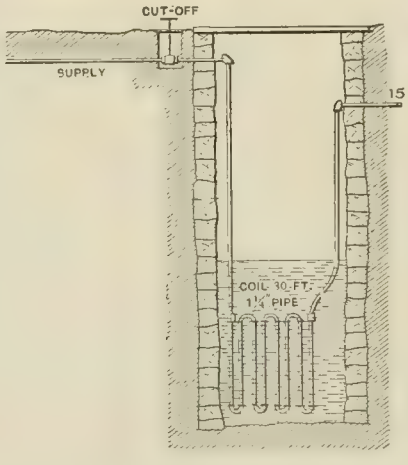
To obtain the area of a circle from the diameter, square the diameter and multiply by the decimal 0.7854.

To obtain the area of a circle from the radius, square the radius and multiply by 3.1416.

To obtain the area of an ellipse, multiply the product of the two diameters by the decimal 0.7854. Thus, supposing an elliptical roof to measure 5 x 8 feet, the operation would be performed as follows: $5 \times 8 = 40$, and $40 \times 0.7854 = 31.416$, or 31½ square feet in the roof.

Trouble With a Well Cooler.

From YOUNG MECHANIC, *Marshall, Texas.*—In answer to "P. R. F.," in *The Metal Worker* of July 1, he will find nothing better for cooling water for drinking purposes than a coil made of 1 inch or 1¼ inch iron pipe, using return bends and about 30 feet of pipe. I would also advise the pipe from the well to the sink to be put deeper under the ground, at least 3½ feet, to prevent the water being warmed by the ground before it gets to the sink. I have put in a number this way and never had a complaint. At one time the drinking slab was 200 feet from the well and had a creamery attached to it 15 feet from the well; ⅜ inch pipe was used from the coil to the faucet to lessen the amount of water drawn before the cold water came, as shown in Fig. 1. If he uses a boiler I would advise that it be connected like a range boiler with the boiler upside down, as in Fig. 2. The trouble came from the water passing straight through the boiler, and the cold water stands in the boiler as a dead end. I have never used a boiler for this purpose, but think he will find my suggestion will remove his trouble. I would advise the use of the coil with pipe cut short enough to be kept well under the water at all times. If he uses either of these suggestions, or some other, I hope he will give the readers his experience.



Trouble with a Well Cooler.—Fig. 1.—Plan Suggested by "Young Mechanic."

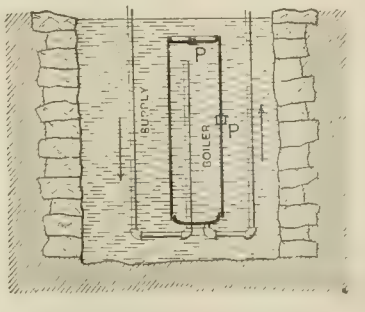
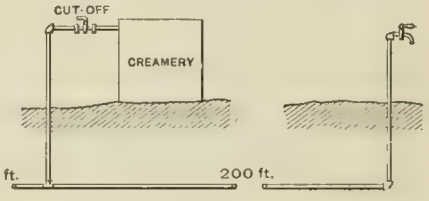


Fig. 2.—Vertical Boiler for Cooler.

Note.—The operation of the cooler shown in Fig. 2 would be insured by the use of the opening in the top of the cooler for connecting a small pipe with a cock at the top end, conveniently located so that the air could pass out of the cooler as it filled.



Tapering Furnace Pipe.

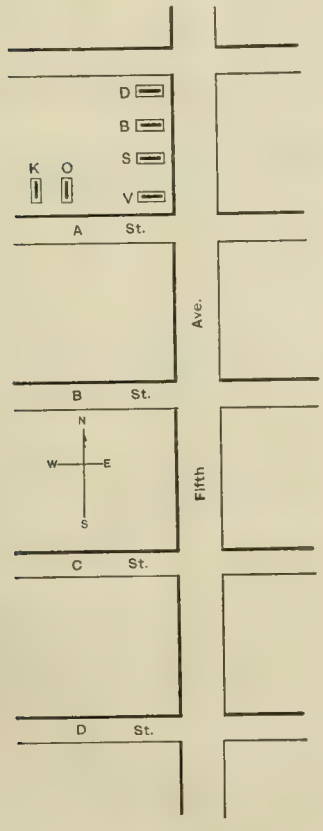
From J. F. T., *Meadville, Pa.*—There is a difference of opinion between A and B as to the best way of putting a hot-air pipe on a furnace. A contends that a pipe of any given length, say 12 feet, and tapering from a 12-inch collar to a 9-inch collar in the register box will discharge more hot-air than to reverse the pipe and start from the furnace jacket with a 9-inch collar and taper it to a 12-inch collar in the register box. We agreed to leave the question to you. Of course, B takes the opposite side of the question from A.

Note.—We doubt if the actual difference in the flow of hot air through furnace pipe arranged in the two ways mentioned would be noticeable, but there is probably some difference, nevertheless. Without having specific data on which to form an opinion we cannot do other than to mention some of the reasons why we think a pipe with the smaller collar at the furnace would carry the greater quantity of air. In either case, it is needless to point out, the air will have to pass through a 9-inch aperture. By having the 9-inch aperture 12 feet from the furnace the air will have an opportunity to cool in going that distance, and consequently the flow will be reduced in speed. On the other hand, if the 9-inch collar is at the furnace jacket the air passing through will be at the highest temperature, and as it cools in traveling the 12 feet of pipe there will be ample opportunity for it to escape, and consequently the speed of flow will not be materially reduced

and will not, therefore, put any back pressure on the air coming from the furnace. We would like to have this matter discussed by our readers, and if any of them can furnish results of practical experience their records will be the best basis for a settlement of the discussion.

A Chimney Problem.

From X. Y. & Z., *Washington.*—We have a problem before us which we would like *The Metal Worker* to help us solve. The sketch shows the location of the streets and D, B, S, V, O and K represent six cottages of seven rooms each besides the hall. A very steep grade runs up Fifth avenue, so that B, C and D streets are all higher



A Chimney Problem.

than the roofs of the cottages. The prevailing winds are from the southwest. The houses are all exactly alike in plan, each having a chimney in the middle of the house that has two openings in different rooms on both the first and second floors. The chimneys are 8½ inches square, clean and smoothly plastered inside and run clear down to the ground, but have no clean-out openings and have been built three and a half years. At all of the houses wood is used for fuel, generally pine, tamarack and fir. Houses D and O have "burned out" their chimneys three times each this year, and for the past four months have taken down their stove pipes every 30 days and cleaned them to avoid more fires. Each time considerable soot has accumulated, even in 30 days. At D and O what is called a Todd stove is being used, while at all of the other cottages direct draft wood-burning stoves are used. The pipes in these two houses show a hard, shiny deposit under the soot proper that looks as if moisture from some source had baked on. The soot cannot be scraped out clean, but only down to this deposit, which is not found in the pipes of the other houses. Only at D and O have fires occurred, though all of the other houses have run their stoves as strong. At O but one pipe has been connected with the chimney, while at D there have been two. All of the chimneys have a strong draft. What we want to learn is why do the chimneys at D and O burn out while the others do not, and what is the cause of their burning out three times since January 1, and what remedy can be applied?

Note.—The chimney, though an old institution, occasionally acts in a manner that baffles those who have had a wide experience in connection with it, and as a rule all remedies tend toward an improvement in the draft. It is generally conceded that an accumulation of soot is the result of a sluggish or obstructed draft. In the case in question the conditions are so nearly alike that the trouble is probably due to a purely local cause. There is seemingly no good reason why the two houses stated should be affected by outside conditions which do not affect the others. While a claim is made for a "strong" draft, the symptoms suggest a different state of affairs. The condensation noted would not occur in the pipe if a strong draft carried the vapors, arising from combustion, rapidly out of the top of the chimney, and the same is true regarding the soot that is now deposited. The Todd stove is sometimes made with a diving flue, which cools the products of combustion before they reach the chimney, so they have less buoyancy for rising than would be true of a direct draft stove. As there are other openings into the chimney they may be sufficiently open to partially supply the draft of the chimney, when the smoke would be left largely to dispose of itself, which it does in condensation and soot. Even though the chimney is supposed to be perfect throughout, a reduction in size where it passes some timber or a similar contraction may be found on search. An accumulation of broken bricks or other unexpected obstruction has often been found the cause of a deposit of soot.

Expansion of Metals.

From L. K., *South Norwalk, Conn.*—Kindly inform me through the columns of *The Metal Worker* the name of the metal which expands the quickest.

Answer.—The speed of expansion of metals is something we have never seen treated. It would depend upon the conductivity of the metal as well as upon its co-efficient of expansion. We assume, however, that our correspondent wishes to know what metal expands the most. At any rate, that is the question we shall answer, and if we are mistaken in interpreting his inquiry, we trust he will write us further. In the ordinary tables the greatest expansion is credited to zinc, which varies between $\frac{1}{329}$ and $\frac{1}{340}$ of its length between 32° and 212° F. The expansion for 1° F in a length of 100 feet for sheet zinc is 0.0196 inch; lead expands under the same conditions 0.019 inch; tin expands 0.0145 inch; copper 0.0115 inch.

Trouble with Water Back.

From H. W. Hess, *Portland, Maine.*—In *The Metal Worker* of July 15 is a letter from "J. P. & S.," Haddonfield, N. J., in reference to trouble with water back. I have many times in 30 years' experience found just such trouble, and, as a rule, I have discovered the cause in the water back. A short time ago I met with the same difficulty. By running the fire for all it was worth I could not get the water hot enough to wash dishes, but by taking out the back and putting in its place a brass coil it gave entire satisfaction. As I was curious to know what the trouble was, I broke the water back in pieces and found that the iron was so thick on the side next to the fire that it could not become hot. I think if "J. P. & S." will try the brass coil they will have no trouble in heating water.

Removing Zinc from Tin.

From A. M. C., *Leonardsville, N. Y.*—Will you kindly give, through the columns of *The Metal Worker*, some way for removing zinc from pig tin which has been used in tinning iron. The quantity of zinc is small, but enough to prevent working?

Answer.—In *The Metal Worker* recently the following method was given for cleaning solder that contained zinc, which possibly will answer for cleaning tin: Burn sulphur on the surface of the melted metal, stirring it constantly to bring the zinc in contact with the burning sulphur and remove the dross with a skimmer. "C. W. B.," Fresno, Cal., seeing that method, stated later in the Letter Box that he used common salt with as good or better results, and found it much less disagreeable to use. We shall be glad to hear from those who have had experience in cleaning tin if better methods exist.

Stove Makers Criticised.

From S. & W., *Walden, N. Y.*—We are not doing so much in stoves now, but will soon have to be buying, and would like to know from other readers of *The Metal Worker* what they think of the way stoves are put together. If the stove manufacturers would take the dealers into their counsel a little when they are getting up stoves so many bolts and nuts would not be put in such out of the way places where they cannot be got at. When repairs are necessary and the nuts rusted fast great danger of breaking is run if an attempt is made to cut them, or much time and hard labor must be spent if a breast drill has to be used.

Note.—The theme of our correspondent is not new, yet it is interesting, and if discussed may bring some new fad, making the rods, bolts and nuts used in stove construction an ornamental feature.

Air Supply Filter.

From W. M., *Ohio.*—It would be interesting to me, and probably others, if the readers of *The Metal Worker* would give in The Letter Box what they have used for screening air entering the cold-air boxes of hot-air furnaces in sections where soft or bituminous coal is largely employed for fuel.

Note.—This is a question that is growing in interest and we hope our readers will respond to the inquiry and describe in detail the plans and apparatus they adopt.

STEAM AND HOT WATER.

The Marsh Improved Air Valves.

James P. Marsh & Co., 224–226 Washington street, Chicago, are putting the improved air valves herewith illustrated upon the market. The No. 2, shown in Fig. 1, is mentioned as having a large and strong drain-pipe connection, absolutely tight. The No. 3 A, Fig. 2, is said to fulfill all the requirements that can be demanded by the most exacting fitter. It is provided

The Marsh Improved Air Valves.—Fig. 1. —The No. 2 Valve.

with a large evaporating cut or air moistener, which is claimed to be very effective. The No. 3 A valve has been applied in the following Chicago buildings: Marshall Field Building, Art Institute, Isabella Building, Chicago Beach Hotel and Windermere Hotel.

Fig. 2.—The No. 3 A Valve.

The following statement is taken from a catalogue recently issued by the firm:

Automatic air valves are absolutely necessary if a steam coil or radiator is to be continuously active in radiating heat. As air and steam cannot occupy the same space at the same time the air must be allowed to escape, in order that the radiator may be hot. This must be done automatically, for the ordinary air cock does not get the requisite attention.

The Marsh patent automatic air valve is constructed on purely scientific principles. The composition of the expansion tube is such that it will always contract to its original length when cooled, and makes the valve, therefore, perfect in its action without the variation shown in others even when properly adjusted. The waved sides give an elasticity to the U-shaped rust-proof steel rods which hold the stationary part of the valve, and prevent accidental injury to the seat of the valve, or the striping of its thread, so common in other valves when they have been screwed too tightly.

HEATING NOTES.

E. D. Smith of the firm of Baker, Smith & Co., New York City, has been elected a member of the Executive Committee of the Master Steam and Hot Water Fitters' Association of the United States to fill the vacancy caused by the resignation of George H. Morris, who found it inconvenient to serve.

Contracts for steam heating and ventilating apparatus for the Government, at Plattsburg, N. Y., will soon be awarded.

Petition has been made to the court far a better system of heating and ventilation in the Court House, at Lock Haven, Pa.

Bowker & Tripp, New Bedford, Mass., have taken the contract for installing a steam-heating plant for the New Bedford Button Company.

Some of the contracts now being filled by T. B. Coyer & Co., Newark, N. J., are the installing of a No. 58 American safety sectional boiler for steam, made by the American Boiler Company, with 1300 feet of the American Radiator Company's Perfection radiators, at 128 Chambers street, New York, for Samuel Colgate; a No. 26 Perfect hot-water boiler, with 900 feet of Detroit radiation, in the residence of Harry Hunneke on 170th street, and a No. 3 Surray hot water boiler, made by the J. L. Mott Iron Works, with Detroit radiation, in the residence of E. J. Bimbler, at Newark, N. J. They have just completed the erection of a steam-heating plant in the St. Barnabas Hospital, at Newark.

The contract has been awarded to the Falls City Heating & Plumbing Company for installing the heating apparatus in the new City Hall, at Spokane, Wash.

A patent has been granted to Nelson Curtis, Boston, Mass., for an improvement in pressure regulators, the invention relating to that class of regulators by which the pressure of the fluid-operating mechanism of the system to which the regulator is applied is controlled by the pressure of a separate fluid. The invention consists of a detail of construction, the principal feature of which is a hook, by the use of which the usual directions of the two forces controlling the auxiliary valve are reversed.

Contracts not to exceed $1200 will be made to secure sanitary appliances and steam heat for the Russell School, at Pittsfield, Mass., if the School Board can get the appropriation from the City Council.

The J. F. Pease Furnace Company, Syracuse, N. Y., have been awarded the contract for heating the Academy building at Windsor, N. Y. A combination system of steam and hot air will be used.

The High School building, at Hastings, Neb., will be heated by steam, Anson & Pratt of that city installing the plant.

The contract for heating and ventilating the Elm street school building at West Roxbury, Mass, has been awarded A. B. Franklin, at the reported price of $3192.

The School Board of Lynn, Mass., have authorized the Committee on Sanitation to expend $1500 for heating and ventilating the Parrott street school house.

C. Steinhoff was recently awarded the contract for the heating apparatus in the main school at West Hoboken.

T. P. Aitkin, Manchester, Conn., received the contracts for heating the Methodist church at Burnside with a furnace and the Oakland school with steam.

A resolution of the Building Committee recommending the placing of a small boiler in School No. 10 to run the ventilating apparatus was adoped at a recent meeting of the Albany, N. Y., School Board.

The Supply Committee of the School Board of Troy, N. Y., at a recent meeting were authorized to advertise for bids furnishing a new heater and repairing an old one in School No. 6.

A local authority says the question of heating the Huntington and Jackson halls, at Lowell, Mass., will need serious consideration in the near future.

The Reading, Pa., City Council recently passed a resolution directing the Police Committee to reconstruct the steam heating apparatus in the City Hall.

Contract for placing a new hot-water heating system in St. Peter's Church at Albany, N. Y., has been awarded to James Hunter.

Sealed proposals will be received at the office of the Supervising Architect, Washington, D. C., until August 24, for the labor and materials for a heating and ventilating apparatus in the U. S. Court House, Post Office, &c., building at Scranton, Pa. Drawings and specifications may be obtained at the office of the Supervising Architect at Washington, or at the office of the superintendent at Scranton.

The American Radiator Company, through their New York office, 92 Centre street, are in receipt of orders for the following buildings: Through Baker, Smith & Co., heating contractors, Weschler Building, Broadway and Thirty-first street; Hon. Seth Low's residence, East Sixty-fourth street; Brooklyn Storage and Warehouse Building, Brooklyn. Through E. Rutzler, heating contractor, Rev. E. P. Mahoney's

school, Madison avenue, New York; hotel, Forty-first street and Broadway; Decker Building, Broadway; St. Joseph's Church, Dean street, Brooklyn; Methodist Episcopal Hospital, Seventh street. Through Degnan & Co., the State Insane Asylum at Middletown, N. Y., and the Boys' High School, Putnam and Marcy avenues, Brooklyn. We understand from the American Radiator Company that business is comparatively quiet at present, but there are prospects of a very good fall trade.

WE ARE INDEBTED to the Walworth Construction & Supply Company, 60 Pearl street, Boston, Mass., for a copy of a publication entitled "10 to 1." This curious name, which is familiar to our readers, refers to a treatise on the selection of a house-heating boiler, with a description of the Equator for steam and the Gulf Stream for hot water. Some valuable information is given in the introductory chapters of the book, and then the specific account of the two boilers mentioned is taken up, the text being illustrated by a sufficiency of cuts, showing both general, sectional and detailed views of the apparatus. At the end is a list of sizes, with dimensions and prices, and also a number of testimonial letters. The book is an interesting treatise and will repay perusal.

THE PLANT of Hart & Crouse, Utica, N. Y., is running full and in some departments extra time is made, which manager W. M. Mackay of the New York office says is due to the attractions in the line of Royal hot-air furnaces and hot-water and steam boilers.

PERCIVAL H. SEWARD, engineer of the New York office of the American Boiler Company, will sail for England on the 19th, making a flying trip, as he expects to return early in September.

D. F. MORGAN has left the New York office of the D. F. Morgan Boiler Company to spend a few days at the factory at Akron, Ohio.

THE CRESCENT FLUE RADIATORS, made by T. C. Joy & Co., Titusville, Pa., will be used for heating the new building of the Mutual Reserve Insurance Company at Broadway and Duane street, New York.

THE AMERICAN RADIATOR COMPANY, 111 and 113 Lake street, Chicago, report that they have received another large order for radiators from Germany; also an order for radiators to be shipped to Sweden.

GEO. D. HOFFMAN, 82 Lake street, Chicago, is to supply the steam heating plants for the Endeavor Presbyterian Church, Chicago, and Chas. Byrne's flat building at Englewood, Ill.

JOHN W. MILLS, 100 Lake street, Chicago, is to furnish a Capitol hot-water heater for the lighthouse, Chicago harbor. Also Bolton hot-water heaters for schoolhouses at West Branch, Iowa, and Eau Claire, Wis.

THE ILLINOIS HEATING COMPANY, 88 Lake street, Chicago, report that over 55 contracts for steam and hot-water heating have been taken since March 1. Among these can be mentioned residences of J. B. Earl, St. Louis avenue and Adams street; F. W. Thurston, Forty-first street and Grand Boulevard; E. W. Chase, Washington Boulevard; two residences of Samuel Hall, Garfield Park; three residences of M. D. Hathaway, Garfield Boulevard; apartment building of R. A. Greifenhagen, Dearborn avenue, and South Side Masonic Temple, Indiana avenue and Thirty-first street.

THE M. E. HERBERT HEATER COMPANY, succeeding M. E. Herbert, have removed their plant from St. Joseph, Mo., to Forty-first and La Salle streets, Chicago. The building secured is 75 x 175 feet, and will be used for office, boiler shop, foundry and machine shop.

THE BAKER & SMITH CO., 193 to 197 Van Buren street, Chicago, are to furnish the necessary pipes for the utilization of exhaust steam for heating and for connecting 27 pumps in one of the largest oil refineries in the United States, located at Louisville, Ky. The same firm also furnish the steam heating plant for the McHenry County, Ill., Court House.

THE BOARD OF ALDERMEN of Fitchburg, Mass., recently made an appropriation for heating and ventilating the Day Street School.

VISCHER & CLARK, Cohoes, N. Y., have the contract for the steam heating plant for the new Island School.

AT MINNEAPOLIS, MINN, the hospital Committee of the Board of Charities will alter the Brackett residence into a hospital and a central heating plant. Tunstead & Moore will install the heating apparatus and W. W. Sykes & Co. will do the plumbing work.

A COLLECTION is being made to purchase furnaces for the Congregational Church at Chester, N. H.

DONALD CHISHOLD has the contract for heating the McKeesport, Pa., hospital with a hot-water system.

THE TOWN OF AMHERST, MASS., will continue the work of school ventilation and sanitation. The Amity Street School is to be the next.

E. P. BATES, Albany, N. Y., has been awarded the contract for heating the Granville School building.

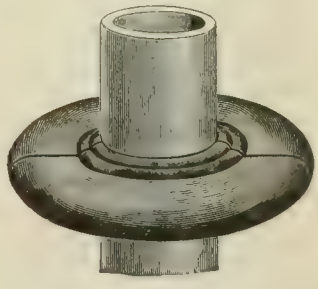
JOSEPH M. STOUGHTON has resigned his position as secretary of the Model Heating Company, but it is possible that he may re appear in the heating business in the not distant future. At least, that is the wish of his many friends in the trade.

Heating Estimate Blanks.

An interesting publication has recently been devised and issued by the Nason Mfg. Company, 71 Beekman street, New York, that will appeal particularly to those who are interested in the steam and hot-water heating trade. The book is a substantial publication of a couple of hundred pages or more and contains estimate blanks for steam and hot-water fitters adapted more particularly for dwellings and apartment houses, small stores and general low-pressure work by either steam or hot water. An introductory note addressed to the steam and hot-water warming fraternity contains some pertinent observations on the value of keeping a record of estimates. Too often this important memorandum is recorded on stray slips of paper, which are destroyed as soon as done with. Furthermore, this haphazard method of estimating often results in the overlooking or omission of important items that may make a difference between profit and loss in the heating contract. This serviceable volume, issued by the Nason Mfg. Company, is a collection of blanks bound in a book 6 x 10 inches in size. At the beginning are blank pages for indexing the 100 estimate forms, giving the name and address of the owner, architect, building, location, price and date. Each two succeeding pages contain the blanks for the estimate, name, kind of building, where located, architect, material of building, date, number of stories, number of rooms and system of warming; following which is a set of blanks for the different stories, giving names of the rooms, dimensions in cubic feet, with columns for the ratio of surface to volume and the square feet of surface, both direct and indirect. The estimate form on the opposite page has the proper spaces for recording the cost of surface, valves, air cocks, pipe fittings, &c., while at the bottom are the other items of heater regulators, pipe connections, hangers, air pipes, &c., and lines for inserting the cost of work, at the end being the quoted price, actual cost, profit, the estimated cost, the date of beginning work, and other important items. The volume is carefully devised, and will, we believe, prove useful even to those fitters who may not install exclusively the Equator or Gulf Stream heaters.

O. K. Pipe Plates.

T. B. Cryer & Co., Newark, N. J., have recently patented the subjects of our illustrations, which are known as the O. K. adjustable floor plate and



O. K. Pipe Plates.—Fig. 1.—O. K. Adjustable Floor Plate.

ceiling plate. The O. K. adjustable floor plate, Fig. 1, is made with a wide flange, to cover an irregular large hole, and is sufficiently arched to set down flat while covering a fitting that projects above the floor. They are made in two parts, neatly joined and held by

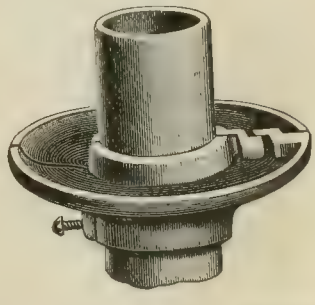


Fig. 2.—O. K. Adjustable Ceiling Plate.

one set screw. The O. K. adjustable ceiling plate, Fig. 2, is made with a wide flange, and in two parts, readily secured to the pipe by a single set screw. Both plates have an ingeniously contrived lug lock, that permits the two parts to be joined around piping that is completed, and are securely held by the one screw. They are cast with a deep mark across the hidden surface, so that the plate can be readily broken to fit close where two pipes come close together. They are made plain and nickel plated, in sizes for pipe from ¼ inch to 6 inches.

World's Fair Exhibits.

GRAND RAPIDS REFRIGERATOR COMPANY of Grand Rapids, Mich., together with the Northern Refrigerator Company of the same city, make a very handsome display of the Leonard Cleanable and the Glacier Refrigerators in the Manufactures Building. Their space is inclosed by an open frame work of oak and brass. Around the top are brass letters attached to fret work panels. The exhibit consists of a great grocer's Refrigerator, restaurant Refrigerators, large and small, domestic Refrigerators, beautiful Sideboards, florist's Refrigerators, &c., the entire exhibit comprising some 16 samples. The announcement is made that all these goods were taken from regular stock and not manufactured for exhibition purposes. Nevertheless, they are exceedingly handsome, and thus demonstrate the superior workmanship which is the standard set up by these companies. All are made of hard wood and are elegantly polished and finely carved. The Hardware used is of the makers' special designs. The hinges are of open work in solid brass, while the locks are solid brass, with double lever catches which fasten the doors at the top and bottom as well as in the center.

J. R. BRYANT & Co. of Crawfordsville, Ind., exhibit numerous specimens in Galvanized Iron and Copper of their Crest Tile Conductor, a combined cresting, ridgeboard and electrical conductor. This is made of a sheet of metal folded flat to form the top, while the sides are widened and shaped to fit the form of the comb of the roof. The cresting thus made extends some 6 inches above the roof and is cut in ornamental patterns.

THE NEW JERSEY WIRE CLOTH COMPANY of Trenton, N. J., make a very practical exhibit in the Manufactures Building. They have erected on a portion of their space a small building, with floors, walls, partitions and ceiling constructed with wire lathing. The floor is laid on steel beams, covered with wire lath, and consists of concrete, which is as firm and substantial as though it were brick laid on solid earth. On one side is a wire brick partition, with a portion uncovered by plaster. The same method is followed in showing the construction of a solid hard plaster partition on wire lath, a fire-proofed column on corrugated wire lathing, a fire-proofed column on patent stiffened wire lathing, and a stud partition with the same kind of lathing. Grouped inside, on top and round this structure are rolls of Wire Cloth, Poultry Netting, Fencing and other fabrics of woven wire. An exhibit is made of fire-proof scenery for theaters, the curtain being made of Wire Cloth, as well as the accessories. On these have been painted in oil designs and landscapes of a high order of merit, illustrating their perfect adaptation to this purpose.

THE GILBERT & BENNETT MFG. COMPANY, Georgetown, Conn., New York and Chicago, are distributing a souvenir, this being the seventy-fifth anniversary of the company. Views are given of their exhibits located in the Manufactures Building, section Q, block 3, and in the Horticultural Building under the dome; also, of their factories, stores and offices. A portion of the book is devoted to an interesting explanation of Netting and Fencing.

KEEN & HAGERTY of Baltimore, Md., have arranged their exhibit of pieced and stamped Tinware on a large rack with shelves on both sides, as their space is narrow, with an aisle on both front and rear. The display is arranged effectively, comprising a large number of kitchen utensils, decorated Bathtubs, decorated Chamber Sets, Oil Tanks, hospital specialties, Water Coolers, &c. They manufacture the Columbian Rotary Steel-faced Nutmeg Grater, the Columbian Pie Plate with a corrugated bottom, the Wagandt soldering system and other specialties.

THE UNITED STATES WIRE MAT COMPANY of Decatur, Ill., display their products in a glass case of special design, with large plate-glass sides and a plate-glass roof. In this a great variety of Wire Mats are shown in rolls and flat. The peculiarity of the Decatur Mat is that it is composed of separate links, so that it can be almost as tightly rolled as a piece of carpet. This flexibility is a feature that makes the Mat accommodate itself to inequalities in a floor, so that it will always lie perfectly flat and yet will not curl up at the edges. It is made in any length and any width. When furnished in rolls of long lengths, pieces can be cut off as desired, thus avoiding the necessity of a jobber carrying in stock a great number of separate Mats of various sizes to accommodate his customers. The company are exhibiting in the Manufactures Building.

GRISWOLD MFG. CO., Erie, Pa., make an admirable display of their Erie hollow ware at the World's Fair. Large showcases surround three sides of the space. In these cases are arranged highly polished specimens of Skillets, Pans and Pots, also Waffle Irons in several sizes, Cake Bakers of many patterns, Broilers, Lid Lifters in numerous designs, Iron Holders, Mail Boxes, &c. Nickel plated Skillets are displayed in separate compartments in the front of the other cases. The extreme top is bordered with cold-handled Tea Kettles, some galvanized and others tinned. A sign composed of miniature Skillets stretches across the rear of the top. The railing in front is composed of miniature Tea Kettles strung on chains. Columns on each side of the entrance support nickel plated fire sets, consisting of a stand with Shovel, Coal Tongs, Poker and Brush. The display is made in the Manufactures Building.

The Gatling machine gun has been still further improved by the adoption of an improved feed. With this new feed the motion is positive, and there is no failure in any part of the movement, while the cost has been reduced from $2.50 for the old feed to 2 cents for the new device. Another advantage is that a much larger amount of ammunition can be carried with the gun than by the old way. The gun can be fed by the new arrangement with the greatest rapidity. With it it has been fired 3120 times in a minute, and when turned by a small electric motor attached to the breech it can be fired 5000 times a minute. This improved feed was developed and applied to the gun used in the United States Government test in the shops of the Dwight Slate Machine Company of Hartford, Conn. The patents are in the name of two of the employees of these shops, and will be assigned to the Gatling Company. The Dwight Slate Machine Company are now engaged in adapting an electric motor to operate the feed, the electrical part of which is made by the Eddy Electric Company.

Latest official reports announce the existence of 50 derelict vessels floating in the Atlantic Ocean that are regarded as dangerous to navigation.

Prize Competitions.

Prize Competition No. 27 (Reopened).

SUBJECT:

Local Associations of Merchants.

This competition closed July 8, but in view of the exceptionally few replies which have been received from the trade and the importance and practical nature of the subject, we reannounce it as above, and extend the time up to which responses will be accepted to September 16.

The formation of local associations has been found feasible in many places for the purpose of securing more friendly relations among competitors and reaching an understanding in regard to matters of common interest. Among the good results referred to as coming from such associations are the following: Overcoming petty jealousies; cultivating a spirit of fraternity; listing of undesirable customers; an understanding in regard to time of presenting bills; putting in operation early-closing movements; agreement as to the prices at which goods are to be sold; mutual accommodation in supplying goods which one merchant may be temporarily short of, &c. The subject is thus evidently a broad one and of a good deal of practical interest. In discussing it the following points are suggested:

Whether it is desirable to have such associations;

How such associations may be organized;

The objects to be accomplished by them.

It will also be of interest to have any information in regard to the practical working of such associations.

This competition will remain open until September 16, 1893.

Those intending to compete are reminded that it will not be necessary to write long essays, but that comparatively brief and business-like answers will be favorably regarded as meeting the purpose for which these competitions are announced.

The following prizes will be awarded:

First prize	$12.50
Second prize	7.50
Third prize	5.00

The prizes will be awarded for answers which, in the judgment of the Committee of Award, are most suitable for publication and of the most general interest.

The committee to whom the papers in Competition No. 22 were referred have awarded the prizes as follows:

First prize to A. H. HOPE.

Second prize to CHAS. S. COOM.

Third prize to W. F. VAN WINKLE.

TIN PLATES.

Imports of Tin and Tin Plates.

The following figures, compiled from official Treasury statistics, show the importations of tin and tin and terne plates through the port of New York for the month of June and the twelve months of the last two years :

	Month ending June 30, 1893.	1892.
Tin in bars, pigs, &c., lb.	9,320,785	5,819,567
Tin in bars, pigs, &c....	$1,859,822	$1,174,068
Tin plates, terne plates and taggers' tin, lb...	60,220,956	58,268,871
Tin plates, terne plates and taggers' tin.....	$1,666,824	$1,643,902
	Twelve months ending June 30, 1893.	1892.
Tin in bars, pigs, &c., lb.	61,076,464	43,908,652
Tin in bars, pigs, &c....	$12,358,999	$8,667,870
Tin plates, terne plates and taggers' tin, lb....	628,425,902	422,176,202
Tin plates, terne plates and taggers' tin.....	$17,565,640	$12,315,562

SCRAP.

RECENT ADVICES from England anticipate that the general strike of coal miners will seriously affect the makers of tin-plate bars in Great Britain, which will in turn affect the Welsh tin-plate mills and reduce their output, diminishing at the same time the demand for pig tin.

A PRESS DISPATCH from New Castle, Pa., states that it is officially announced that the New Castle Tin Plate Company's steel works will start up next week, the new tin-plate mill commencing operations at the same time. The sheet mill is now running full time.

THE NEW ZEALAND TIN FIELDS at Stewart Island, about which such promising reports were made a few years ago, have been disappointing, the quantities of ore found being insufficient to pay working expenses, in the face of the extreme difficulty in obtaining water.

THE MOST COVETED HONOR among the British Volunteers has this year been won by a Welsh tin plater—Sergeant W. T. Davies of the 1st Welsh Volunteer Battalion--who carried off the Queen's Prize at the annual shooting tournament at Bisley. Mr. Davies is a rollerman at the South Wales mills, Llanelly. Messrs. Morewood & Co., the proprietors of the mills, gave a banquet to all their workpeople in honor of the event.

PART OF THE PLANT of the United States Iron & Tin Plate Mfg. Company, at Demmler, Pa., manufacturers of tin and terne plates and iron and steel sheets, was put in operation on Monday, August 7. Work was resumed in order that the firm could finish up some old orders and get out some new ones for which their customers are pressing them. As to whether the plant will continue in operation right along has not as yet been determined. Tin plates are all that are being turned out, and were it not that the firm are in receipt of orders from old customers who will not use any other brand, their plant would be idle. In view of the great depression now existing in business circles, it is certainly very complimentary to the above firm to be able to state that they have been compelled to start up their works in order to meet the demands of their customers for tin plates, many of whom will not use any other brand.

THE SOMERTON TIN PLATE WORKS of Somers Brothers, Brooklyn, N. Y., are closed for regular repairs, and because the general trade depression has made a short pause in production desirable. The works will be started again full on September 1. Messrs Somers are making bright tin plates for stamping purposes, the greater bulk of which are used at their own tin-box factory, although the firm find a ready sale for all plates produced beyond their own requirements. Trade has been dull for some time, but the firm have experienced some increase in the volume of orders and inquiries during the past week.

UNDER DATE of the 2d inst. the following press dispatch was sent out from Elwood, Ind. : "Information reached here this evening that the tin-plate factory at Atlanta, Ind., south of this city, had passed into the hands of the receiver. Operations were suspended this morning and the works locked up. The superintendent, Enoch Stanford, was formerly superintendent of the American Works, north of this city. He, together with M. P. Elliot of Kokomo, was largely interested in the Atlanta plant, which has been in operation six months and was apparently prospering. Particulars as to the cause cannot be obtained this evening, but it is ascribed to dull times and financial stringency."

SHEET MILLS NOS. 1, 2, 4, 5 and 7, the bar mill and one heating furnace in the works of the United States Iron & Tin Plate Mfg. Company, at Demmler, Pa., were put in operation on Monday, the 7th inst. These departments comprise more than one-half of the entire works and give employment to about 300 men, and it is stated that within a short time the balance of the plant will be put in operation.

MEURER BROS. COMPANY, Brooklyn, N. Y., issue a circular letter to the trade, directing attention to their several brands of roofing tin. Prominent position is given to the Meurer roofing plate, which is described as made from a very superior quality of steel, carrying a very heavy coating and made by the genuine palm oil process. The other roofing plates referred to are the Flushing and Pullman, the features of which are noted.

IN SPITE OF THE SEVERE DEPRESSION in business circles everywhere, and the very light demand for goods, the McKinley Tin Plate Company, Wilkinsburg, Pa., are meeting with a good demand for their various brands of redipped roofing plates. This firm have just placed on the market a new brand of roofing plate, which they have termed Wilkinsburg Redipped, and for which strong claims are made. This is claimed to be a hand-dipped plate, and after being dipped, it is subjected to a process which insures even coating on every part of the plate, and consequently a perfectly smooth surface. Considerable of this plate has already been put out, and it is said to have given entire satisfaction in every instance. The design used by this firm on their letter heads is unique and original, and is bound to attract attention. A faithful likeness of Wm. McKinley is shown, and immediately under is a British lion borne to the ground by the weight of some dozen boxes of tin plates, each bearing the imprint "McKinley." The fact that American tin plates are fast crushing out the imported article is brought out clearly and forcibly, and the design reflects considerable credit upon the originator. The business of this firm has grown very rapidly during the past two years, and they attribute it to the fact that they have always aimed to turn out first-class product that will give entire satisfaction. The continued growth of their business would indicate that their efforts in this direction have been successful.

N. L. CORT & Co., importers of tin, tin plate and other metals, at 245 Water street, New York, have made an assignment to Frederick G. Dow, lawyer, of 192 Broadway, giving seven preferences for money loaned, aggregating $34,425. The liabilities are stated to be about $350,000, while the amount of the assets is not yet known. The latter consist of merchandise, bills receivable, outstanding accounts and property to a large amount. The failure is due to depreciation in the price of metals, failure of customers to carry out their contracts with the firm, and the general financial stringency. The firm have been prominent in the metal trade for the last 30 years, and have a high reputation. It is hoped that a satisfactory arrangement may be made with the creditors, and that the firm may be able to resume business.

A MOUNTAIN has been made out of a molehill in the accounts recently published of strikes of workmen and suspension of operations at the works of the Morewood Tin Plate Company, at Elizabethport, N. J. The works have been running as usual, except for the temporary stoppage of one terne stack on account of dullness in the demand for roofing plates. The firm experienced some difficulty on the score of wages with a number of boys employed in the tin house, but the dispute has been adjusted.

The new Forestry Commission in New Hampshire is doing vigorous work in educating the farmers and lumbermen in regard to the extent and value of their forests and the best methods of treating them. It is believed that the New Hampshire forests are worth more for lumbering purposes than all the farms in the State are worth for agricultural purposes.

New York city has $16,000,000 invested in school sites and buildings. This is considerably more than the annual expenditure on education of Italy and Spain combined.

PLUMBING and GAS FITTING.

Proposed Plumbing Laws for Montreal.

We print below the text of an ordinance for the regulation of plumbing, which is proposed for adoption in the City of Montreal :

SECTION 1. All plumbing and house drainage in the city shall he made and constructed in accordance with the following rules, which shall be binding on all parties concerned :

(1)—No drain or plumbing work shall hereafter be made unless plans, drawings and a description of the same shall have been previously deposited by the proprietor or his representative in the Health Office at least eight days before the commencement of the work, and unless such plans and drawings shall have been approved of by the authorized officer; and in case of repairs or alterations affected by sanitary regulations, notice shall be given to the Health Department within 24 hours;

(2)—No part of the work shall be covered or concealed in any way until after it has been examined and approved of by the inspector; and notice shall be given to the Health Department when the work is sufficiently advanced for such inspection;

(3)—The Water Department shall refuse to turn on the water unless the demand for the same is accompanied by a certificate of the inspector, to the effect that the work has been inspected and found to be in accordance with said rules;

(4)—The material used shall be of good quality and free from defects, and the work shall be executed in a thorough and workmanlike manner;

(5)—The arrangment of the soil, waste and ventilation pipes shall be as direct as possible;

(6)—The soil, drain, waste and ventilation pipes shall, if practicable, be at all times exposed to view ready for inspection and for convenience in repairing;

(7)—When necessarily placed within partitions or recesses of walls, soil, drain, waste or ventilation pipes shall be covered with wood work so fastened with hinges, or round-headed screws, as to be readily uncovered;

(8)—Every house or building shall be separately and independently connected with the street sewer, in front of such house or building, or with such other sewer as shall be designated by the Board of Health;

(9)—Every house drain shall be of iron, with a fall of at least ¼ inch to the foot, and no joint shall be made directly under the wall of the house; moreover, where water closets discharge into it, it shall be at least 4 and not more than 6 inches in diameter, and be laid in a straight line if possible. All changes in direction shall be laid with curved pipes and all connections with Y-branch pipes and curved bends;

(10)—Every such drain put in and covered without due notice to the Health Department shall be uncovered for inspection within 24 hours, if required by the inspector;

(11)—No brick, sheet metal, earthenware or chimney flue shall be used as a sewer ventilator, or to ventilate any trap, drain, soil or waste pipe;

(12)—Soil pipes shall be of cast iron of the weight specified in sub-section 20, and shall extend at least 2 feet above the highest part of the roof or coping, light, shaft louvers, window or other opening; they shall be of the same size throughout, and in no case shall they be less than 4 inches in diameter; no cap or cowl shall be affixed to the same;

(13)—Soil, waste and vent pipes in an extension shall be carried above the roof of the main building when they are closer than 20 feet to the windows of the main building or adjoining houses;

(14)—The vent pipe from the horn of a water closet shall be required only when the closet is at a distance of 15 feet from the main ventilation pipe of the drain;

(15)—Rain water leaders shall not be connected with sewers unless by special permission of the Board of Health;

(16)—Joints of sewers and soil pipes shall be gas and water tight;

(17)—When no water closet exists, ventilated in accordance with the rules aforesaid, the main waste pipes shall be of lead or iron of the weight specified in sub-section 20, and shall be not less than 2 inches in diameter unless there are more than four sinks, in which case the size shall be 3 inches in diameter ; and every such pipe shall be continued full size through the roof in the manner prescribed for soil pipes ;

(18)—When lead pipes are used to connect fixtures with vertical soil or waste pipes, or to connect traps with vertical vent pipes, they shall not be lighter than 6 pounds sheet lead to the foot;

(19)—There shall be no traps in connection with vertical soil or waste pipes, unless by special permission of the board of health;

(20)—All pipes shall be sound and free from holes or cracks;

(21)—The following weight per lineal foot shall be accepted as standard :

Iron Pipes for Plumbing Work.

2-inch, 4 pounds per lineal foot.
3-inch, 5 pounds per lineal foot.
4 inch, 9 pounds per lineal foot.
5-inch, 12 pounds per lineal foot.
9-inch, 15 pounds per lineal foot.

For Drain Work.

4-inch, 12½ pounds per lineal foot.
5-inch, 16 pounds per lineal foot.
6-inch, 20 pounds per lineal foot.

Lead Pipes for Waste Sink Pipes.

2-inch, 10 pounds per lineal yard.
4-inch, 15 pounds per lineal yard.

Lead waste pipes, bends or cesspools shall be equal to not less than 6 pounds per square foot of sheet lead ;

(22)—The fittings used in connection with such pipes shall correspond with them in weight and quality ;

(23)—No tar-coated cast-iron pipes shall be used ;

(24)—The plumbing work shall be tested by the inspector in the presence of the plumber (when the latter is required to be present) with the peppermint, smoke, water or any other test approved by the Board of Health ;

(25)—When defective pipes are discovered, they shall be removed and replaced by sound pipes ; defective joints shall be made tight, and every part of the work in which defects are found shall be made to conform to the present rules ;

(26)—Joints in iron drain, soil and waste pipes shall be so filled with oakum and lead and hand calked as to make them gas tight, and they shall not be painted, varnished, tarred or puttied over until after inspection, unless the inspector does not signify his approval or disapproval of the work within 36 hours after the Health Department shall have been notified that the work is ready for inspection; the said joints may also be screwed joints; should the work prove to be satisfactorily executed in the judgment of the inspector, he shall grant a certificate to that effect to the person concerned;

(27)—All connections of lead with iron pipes shall be made with a brass or copper sleeve or ferrule of the same size as lead pipe, put in the hub of the branch of the iron pipe and calked with lead; and the lead pipe shall be attached to the ferrule by a wiped or overcast joint;

(28)—All connections of lead pipes shall, where practicable, be by wiped joints;

(29)—No tile pipe shall be connected with the soil or waste pipe unless the same be provided with a flange to admit of a proper connection being made;

(30)—Every water closet, urinal, sink, basin, wash tray, bath and every tub shall be separately and effectively trapped. This rule shall apply to a set of tubs, but only one trap shall be required for the set;

(31)—The connections between iron and tile pipes shall be made with the best Portland or Roman cement, or by such other mode as may be approved of by the board ;

(32)—Traps shall be placed as near the fixtures as practicable, and in no case shall they be distant more than 2 feet from the fixtures ;

(33)—There shall be only one trap under the water closet, and that immediately beneath the same ;

(34)—All waste pipe fixtures other than water closets shall be provided at the inlet of such fixtures with strong metallic strainers to exclude from such waste pipes all substances likely to obstruct them ;

(35)—In no case shall the waste pipe from a bath, tub or other fixture be connected with a water-closet trap;

(36)—Overflow pipes from fixtures shall in every case be connected within the inlet side of the trap, and above the water;

(37)—Drip or overflow pipes from the safety pan under water closets and other fixtures, or from tanks other than those of water closets or refrigerators, shall be made to run into some place in open sight ; and in no case shall any pipe be connected directly with the drain, waste or soil pipe ;

(38)—Water-closets apartments shall open to the outer air, or be ventilated by means of a window, shaft or air duct, or by a vent shaft to the chimney ;

(39)—Interior water closets shall in no case be supplied directly from the city reservoir supply pipes ;

(40)—In tenement houses containing more than one family there shall be one water closet for each family and a separate cistern for each closet; in other houses, however, a group of closets may be supplied from one tank; but not water closets on different floors;

(41)—The overflow pipes from water-closet cisterns shall discharge into an open sink, or the basin of the water closet, or where its discharge will attract attention and indicate whether waste of water is occurring into the soil or waste pipe or into the drain;

(42)—Valves must be so fitted and adjusted as to prevent wasting of water;

(43)—No privy vault or cesspool for sewerage shall be permitted in any part of the city where water closets can be connected with a public sewer in the street ; when no sewer exists in the street a permit for a temporary privy may be granted by the Board of Health ; and in such case it shall be water tight, of a capacity of 45 cubic feet ; the sides and bottom shall be constructed of cemented brick 12 inches in thickness and well cemented inside ; such vault may be constructed of cast iron, the shape or form of which shall be either circular or oblong, without angles, and with a concave bottom ; it shall be provided with a ventilation pipe at least 4 inches in diameter, extending from the pit through the roof, sufficiently high as to prevent inconvenience to occupants of neighboring houses ; the seats shall have a tight-fitting cover ; it shall have an aperture opening exteriorly to allow of cleaning by pneumatic process, such aperture to be 2 x 1½ feet in size, or else the flooring shall be air tight and shall have a tightly-fitting trap door communicating with the pit ; the top of the vault shall be 1 foot above the level of the ground ; nothing shall be put into such pit except human excreta ; privies shall be located at a distance of 20 feet (or more according as the Board of Health may deem necessary) from any house or street; they shall be emptied when the contents reach to within 18 inches of the top of the vault, or when judged necessary by the Board of Health, by persons appointed by the board ; no offensive smell or gases shall be allowed to escape therefrom. But in no case shall a privy be allowed within the walls of a dwelling house;

(44)—No steam exhaust blow-off pipe shall connect with a sewer or any house drain, soil pipe or waste pipe ; such pipe must discharge into a tank or condenser ;

(45)—Cellars shall not be connected with the house drain unless necessary, and by special permission of the Board of Health, and according to plans approved of by the board ;

(46)—A sub-soil drain shall be provided

when necessary, and shall be constructed and trapped to the satisfaction of the Board of Health ;

(47)—No trap shall be permitted between the house drain and the public sewer, unless by permission of the Board of Health ; conditionally, however, that such trap shall have a handle-hole for cleaning purposes, and a fresh-air inlet pipe, the whole as may be decided upon by the Board of Health ;

(48)—Drains in yards shall, in all cases, be trapped below frost; that is to say, 4 feet at least under ground;

(49)—In the case of privy vaults now drained into a common sewer, they shall be isolated by means of suitable traps placed below frost and according to instructions from the Board of Health;

(50)—In the case of a new house being built or one already existing being repaired, wherever there is a public sewer in the street, a water closet shall be put in, to the exclusion of privy pits;

(51)—The inspection of drains as well as the inspector of drains shall be under the exclusive control of the Board of Health;

Sec. 2. The word "board," wherever it occurs in this by-law, means the Board of Health of the city of Montreal; and the word "inspector" means the inspector appointed by the said board to carry out the provisions of this by-law;

Sec. 3. Any person contravening any of the provisions of the present by-law shall be liable to a fine, and in default of immediate payment of the said fine, and costs, to an imprisonment, the amount of said fine and the term of said imprisonment to be determined by the Recorder's Court, at its discretion ; but the said fine shall not exceed $40, and the term of imprisonment shall not exceed two calender months ; the said imprisonment, however, to cease at any time before the expiration of the period fixed upon by the Recorder's Court, on payment of said fine and costs; and where the infraction is continuous, such infraction during each day shall constitute a separate offense.

We are in receipt of the following criticism upon the proposed ordinance from one who is more than ordinarily familiar with plumbing matters and who recently was in Montreal for several months :

From the unusually high death rate in Montreal we conclude that the passing of a plumbing by-law cannot be too soon accomplished. It is a matter of astonishment that such a progressive city, as we were somewhat surprised to find it, has been so long without what all "up to date" cities on this continent have had on their statute books for years. The proposed laws are by no means stringent, but will do for a beginning ; and we have no doubt ere long they will add clauses requiring the registration of plumbers after examination. This should not be a difficult matter, or a hardship, as the government of the province sustains a fairly efficient plumbing school in the city.

Clause 1. Latter part calling for notification of Health Department, in case of repairs or alterations, is good if it can be enforced, which we doubt ; and it is always unwise to have laws that cannot be enforced and has the tendency to bring the authorities into contempt.

Clause 3. Is an excellent rule and should be easily enforced and will help out No. 1.

Clause 10. Should be made imperative. All drains should be inspected, and the inspector should have no option. There should be no "if," except the "if" it is right it must be done.

Clause 14. We do not see why 15 feet should be allowed to exist unventilated. All dead ends must be avoided in good plumbing work, and if the closet trap is liable to syphonage, being nearer to the main stack of soil pipe than 15 feet will not prevent it.

Clause 15. In most cities it is compulsory to connect the rain-water leaders with the sewers, due regard being taken as to their proper trapping. The rush of water from such pipes flushes the sewers in an admirable manner.

Clause 17. Our Montreal friends seem to still stick to the English practice of using lead waste pipe, long ago discarded in American practice, except for short special connections.

Clause 19. We cannot conceive the object of this clause. Traps are never required on properly constructed lines of vertical soil pipes.

Clause 24. It would be better to have some definite method of testing decided upon ; then the plumber would know exactly what to do in the way of preparation for the test.

Clause 26. Is not definite. If the inspector fails to put in an appearance for 36 hours the plumber can then paint and putty and cover up defects. We can readily conceive how an understanding between the plumber and the inspector would defeat the object of the by-law. The judgment of the inspector should have nothing to do with the question. Decide upon a definite test and mode of fitting, and if the pipes stand the test and are properly fitted, the certificate follows.

Clause 29. We presume the reference to tile pipes refers to outside drains.

Clause 30. No provision seems to be made for preventing the syphonage of traps.

Clause 33. We see no objection to more than one trap provided proper means are taken for thorough flushing and ventilation.

Clause 36. Overflows are best connected into the dip or seal of the trap, thus preventing a circulation of air through the overflow pipes, which are often foul.

Clause 43. Permits the existence of that abomination, the privy pit. In a rapidly growing city it is sometimes necessary as a temporary expedient that some such fixture be erected, but as soon as water and sewers are provided they should at once be done away with.

Clause 49. Allows the existence of privy pits drained into the common sewer. If there are proper sewers, do away with the pits.

Clause 50. Is an acknowledgment of the superiority of the water closet over the privy pit. Then why allow any pits, as in clause 49 ?

TRAPS AND VENTS.

On Thursday evening, August 3, at a meeting of the master plumbers of Newark, N. J., it was decided to call the organization the Master Plumbers' Association of the City of Newark. They then adopted the regulations which govern the association in Brooklyn, N. Y., with the few changes necessary to fit them to their local requirements.

James K. Biglan, Doylestown, Pa., has been awarded the contract for plumbing the new residence of the Rev. Wm. E. Gell.

The plumbing, repairing and setting new water closets in the Post Office at Augusta, Maine, will be done by A. D. Ward.

The plumbing and gas-piping contracts for the Government barracks at Plattsburg, N. Y., are to be awarded soon.

An effort is being made in Providence, R. I., to have the Board of Aldermen pass satisfactory plumbing regulations.

Bids are invited on plumbing the first ward school building at Houston, Texas.

Bradley & Brigham, Marlboro, Mass., are doing the plumbing in the residences of Wm. King and Wm. R. Dee.

Higgins & Co. are a new firm of plumbers at Springfield, Ohio, who succeed Higgins, Weaver & Co. Wm. F. Flynn, a practical plumber of 20 years' experience in Cleveland, Ohio, enters the new firm and will superintend their work, having done the plumbing in some of the largest commercial and residence buildings at his old home.

Elias Berla, president of the Master Plumbers' Association of Newark, N. J., recently enjoyed a visit from Louis Gasser, a former employee in a plumbing shop started by him at El Paso, Texas, which is now run by J. Simons, who bought the business after it had been established three years.

The contract for the plumbing in the new hospital for contagious diseases in Boston was awarded Henry Hussey & Co. of the same city. The price reported is $10,000.

The plumbers' union at Nashville, Tenn., have called off the strike that has been running there for four weeks, but give no reason for the action.

Benjamin Hyde, Chicago, bid $46,000 and will do the interior finishing and plumbing in the Government building at Duluth, Minn.

Frank Lyman will do the plumbing in the new post office at Sacramento, Cal.

Vickers & Brooker, 129 State street and 29 Commercial avenue, Binghamton, N. Y., are extending a local invitation to leave orders for plumbing, steam and hot-water heating, to secure good work.

On being shown the plans for the plumbing work in a large hotel in New York City by Henri D. Dickinson of the Department of Buildings, Dr. Elgin R. L. Gould, expert of the United States Department of Labor, paid a high compliment to the system of plumbing in vogue in large buildings in New York, saying that it was unsurpassed in any other country. Dr. Gould has made a thorough investigation of such systems, and is now engaged in examining into the question of housing working people in large cities.

J. I. Weston will do the plumbing work in the new McKey block, at Exeter, N. H.

Anson & Pratt, plumbers, Omaha, Neb., report a good trade and a good outlook.

Mullarkey & Senior were awarded the contract for plumbing the Nathan Littauer Hospital, at Gloversville, N. Y., the steam heating contract going to Jacob V. Vrooman's Sons, Schenectady.

Talbot & Co., plumbers, at Lynn, Mass., were recently damaged by a storm which flooded their shop with 2 feet of water.

Locke Bros., tinners and plumbers, have moved into their new shop on Spring street, Williamstown, Mass.

The Board of Aldermen of Providence, R. I., recently passed an ordinance providing for an inspector of plumbing and the regulation of drainage and plumbing.

O. D. Peck, secretary of Peck Bros. & Co., Chicago, has gone East for a few weeks' vacation. A. D. Sanders, manager of the Chicago branch of Peck Bros. & Co., has returned to that city from a visit East.

The Board of Experts now sitting at the Navy Department to select a design for a submarine boat will visit Chicago to witness trials of the Baker and the Holland boats, in order to reach a definite conclusion as to their respective merits.

STOVE TRADE NOTES.

The Future of the Hot-Air Furnace.

By A. W. Glessner,

President of the Excelsior Steel Furnace Company.

INTEREST OF ARCHITECTS.

In a previous article I referred to the growing interest taken by architects in the subject of hot-air heating, but stated that as yet this interest was confined to a very small percentage of the profession. It seems at most incredible that for years the architect has been the worst foe to progress in hot-air heating. He has persisted, in season and out of season, in obstructing the work of the hot-air furnace contractor, and all but nullified his efforts to please his patrons. The architect in the preparation of plans has ignored the furnace contractor and compelled him to do his work under the most unfavorable conditions, drawing plans without reference to the heating, locating registers in the most undesirable places, and, worst of all, rendering no assistance to the contractor when the work of installation once began, and endeavoring to make the contractor do impossible things on pain of a forfeiture of his contract. In too many plans no consideration is given to the heating until the roof is on and the partitions are all set, and then the contractor is supposed to get in his pipes without injuring the building. He is ordered to put the register in a chamber 12 feet from a stack, and when he attempts to carry out the order the architect refuses to allow the joists to be cut, and several turns and angles are the inevitable result, and when the architect is advised that said register cannot deliver warm air (under the unfavorable conditions) to heat the apartment the architect refers him to the specifications, which state that contractors must guarantee to heat each room to 75° in the coldest of weather, and threatens to withhold settlement until the guarantee is satisfied. Then, after the register is in, Mrs. Jones, the wife of the owner, decides that said register is in the only place in the room where her dresser can stand, and, therefore, the register must be moved, and as the floor is laid and walls plastered more angles and turns are used, and the change is made at the expense of the hot-air contractor. I have had exactly such an experience in more than one case, and other dealers have doubtless suffered like injustices in silence, but I am glad to note that in many cases architects are showing a desire to learn something of the principles of hot-air heating and a disposition to consider the same in the preparation of plans. I have been frequently called into consultation by architects during the past two or three years when the heating of some building was being discussed, and have noticed a marked change in the methods in vogue in handling that part of the work. It is still almost impossible to get an architect to so write his specifications as to compel the contractors to take cognizance of the hot-air heating and carry out their work so as to provide the necessary channels and passages for the pipes, but if repeated efforts are made by furnacemen to have some such provisions incorporated into the specifications of the architects in whose offices they practice I am sure the end will be accomplished in due time. I suggested this method of handling this matter in an article in one of the trade journals some time since and have received a number of letters on the subject since.

(To be continued.)

Some Special Points About Garland Stoves.

The catalogue just issued by the Michigan Stove Company of Detroit, Chicago, New York and Buffalo is one of the most complete ever prepared by any stove house. It contains a great deal of fresh material, giving numerous details regarding Garland stoves and ranges in addition to the usual cuts illustrating the goods manufactured. The methods adopted in this catalogue are excellent, and we herewith reproduce some of the cuts used, together with a portion of the explanatory remarks.

Fig. 1 illustrates the system employed in securing aërated ovens.

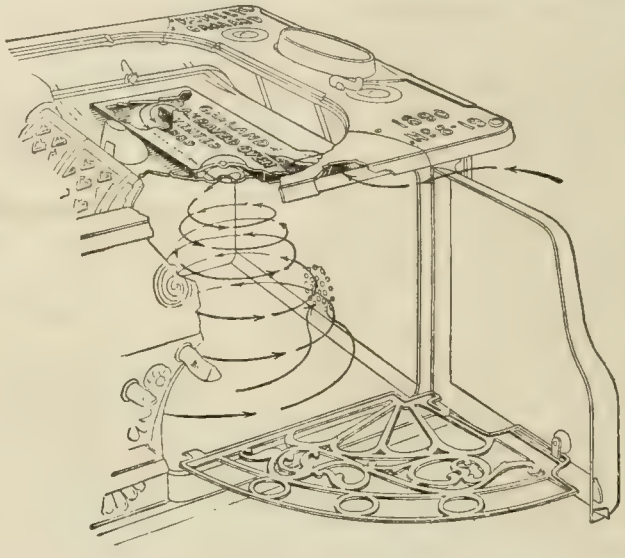


Fig. 1.—Aërated Oven and Automatic Shelf.

In Garland stoves and ranges the fresh air is taken in over the oven doors and passes through a circulating flue underneath a plate which is attached to the top oven plate, thus becoming heated, after which it is discharged into the oven. The heated fresh air then creates a literal whirlwind in rotating from the top to bottom of the oven, carrying all the impure air out of the oven, at the exit provided, and replacing it continually with heated fresh air. The air being heated before entering the oven, the temperature is not lowered. The vitiated air passes off into the flues, carrying with it all odors and gases given off by the cooking food. Some constructions admit cold air into oven, necessitating more fuel for the same amount of cooking. The same cut, it will be seen, shows the patent automatic

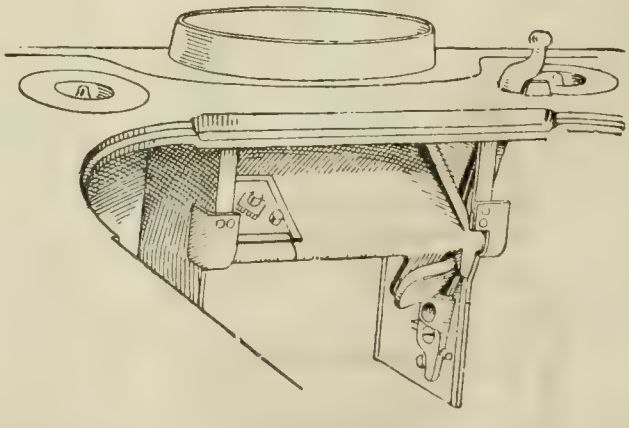


Fig. 2.—Direct Draft Damper.

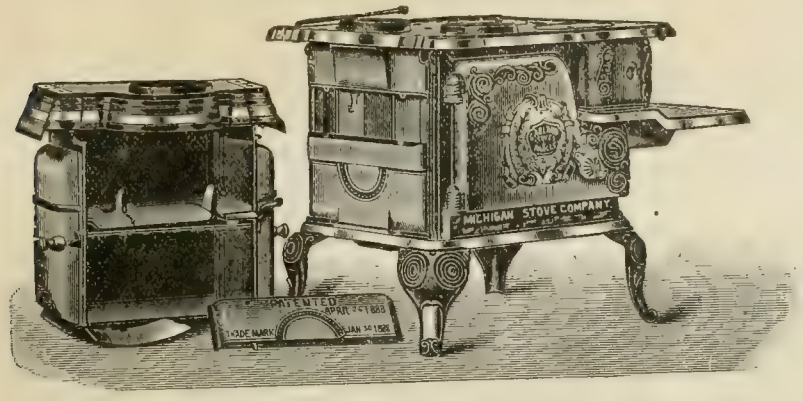


Fig. 3.—Interchangeable Reservoir and Closet System.

but does away with the rod running across the top oven plate, exposing it to the action of fire. This damper is practically indestructible, and can be removed and replaced in a few moments.

The interchangeable reservoir and closet system is illustrated in Fig. 3.

One of the greatest points of vexation and worry known to the retail stove merchant is overcome by constructing all the new line of ranges and cooking stoves so that a reservoir and closet can be instantly attached to a square stove, making it a complete reservoir stove; and, if a square stove is desired, the reservoir and closet can be easily taken off. This is a good point, as it enables merchants to order with less risk.

Sectional cuts are used freely to show peculiarities in interior construction.

shelf (which lies upon the oven bottom), upon which is placed any article which it is desired to roast or bake. By simply turning a knob on the outside of the oven door the shelf becomes attached to the door, and in opening the door the contents of the oven are brought out in full view, so that the convenience of examining or basting is greatly enhanced. The shelf is detachable, and can be used or not, at the option of the user.

Figure 2 illustrates the direct draft damper used in all Garland cooking stoves and ranges. The damper is operated by a handle placed on top of the stove. This arrangement is not only much handier than the old style of placing the damper handle at the side of the stove, where a person had to stoop to see which way it was turned,

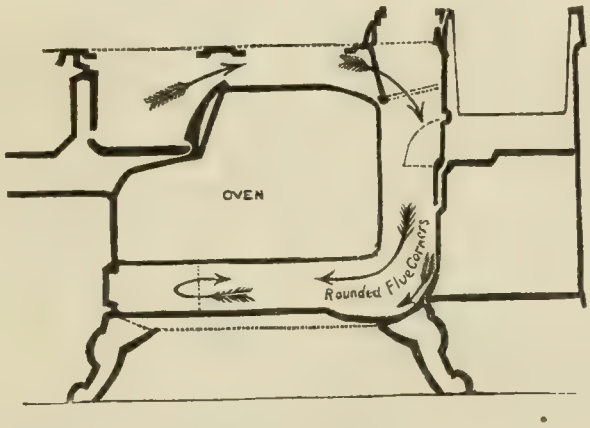


Fig. 4.—Goose-Necked Flue.

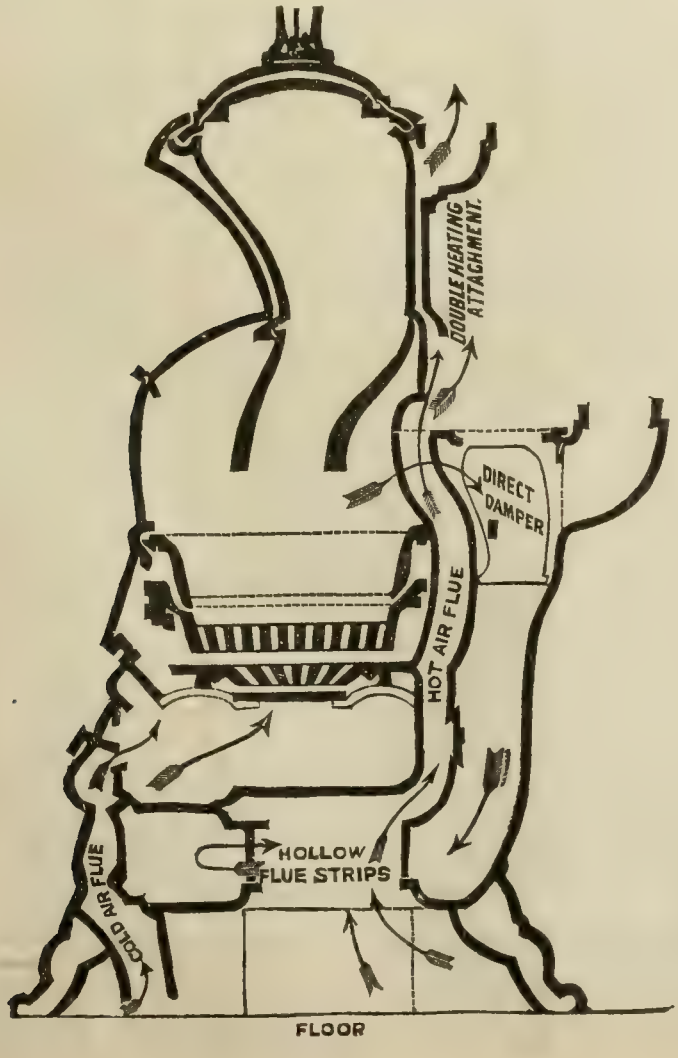


Fig. 5.—Sectional View of Art-Garland.

Fig. 4 is one of these, which shows what is called the "goose-necked flue." This method of flue construction is used in all Garland stoves and ranges. The rounded corners present no obstruction to draft, the principle being the same as in the construction of a round elbow, which is so superior to a square one.

Another sectional cut, Fig. 5, is here introduced to show the manner in which the draft and ventilating flues are illustrated which are used in the Art-Garland base burner for 1893.

The view here given is an excellent representation of the interior construction of this heater, the skeleton lines being ingeniously employed. The hot-air flues are very large and are located in the hottest part of the stove. The front of the flue gets its heat from the fire and the rear a strong heat from the back or down flues. This directly increases the heating qualities of the stove without in any way interfering with its outside or surface radiation. These facts apply to a great many of the Garland heaters, viz: Peerless, National, Acme (revertible flue), Ideal (base heater), Birch (revertible flue), Syphon Oak, Oak-Garland, Horizontal Oak (revertible flue), as well as Ivy-Pennant and Hickory-Pennant.

The catalogue by no means discloses the whole tale regarding the company's achievements, which have just culminated this year. They have accomplished a piece of unparalleled enterprise, putting out a full line of cooking goods all the way through. The work in preparation of this line covered four years and required an outlay greater than is employed by a large majority of stove foundries. Many foundries have less money in their whole business than is invested in this line of patterns. For instance, in wood goods there is a complete line of wood cooks, four-hole wood ranges and six-hole wood ranges;

in soft-coal goods there are four-hole cooks, four-hole ranges and six-hole ranges, while in hard-coal goods there are also four-hole cooks, four-hole ranges and six-hole ranges, in every style and every size. This is believed to be the very first time that any such radical change was ever executed by a stove house, or even dreamed of. Its magnitude can be understood better, perhaps, by the statement that not a single cast iron Garland cooking stove or range current with the company on May 1, 1893, is now shown in their July catalogue or in sample rooms in their various headquarters.

The Phillips & Clark Stove Company

of Geneva, N. Y., send us a copy of their illustrated catalogue and price-list for the present year. It is handsomely printed on a fine quality of calendered paper and substantially bound in board covers. The side title consists of the name and address of the company, a *fac-simile* of their trade-mark, an indication of the line of goods manufactured, and the date 1893, printed in silver upon a red background. The early pages of the volume are devoted to a bird's-eye view of the company's office and foundry at Geneva, a front elevation of their salesroom and warehouse at No. 185 River street, Troy, and to an announcement relative to terms and also concerning the goods which are shown in the catalogue. The leading place is given to the Grand Andes, a substantial six-hole range of good proportions, neat ornamentation, and embodying the modern improvements. It is intended for burning hard coal or soft coal, and is furnished with either the dockash, duplex, prismatic or vindex grate, as required. Following this construction is the Right-Grand Andes, which has been added to the company's assortment this season. It is the same as the stove just described, with the exception of the fire box, which is at the right hand as one stands facing the oven door. Under the name Andes the company offer a six hole range which has been before the trade for some time, and which has met with a very large demand. It is made in the usual modifications, several of which are presented in the volume before us. The Glen Andes is another member of this class and has proven very popular with dealers in all sections where it has been introduced. The same may also be said of the Home Andes, which has been on the market for the past five years. Among the other goods of attractive exterior and embodying the latest improvements we note the Lake Andes, made in three sizes ; the Right-Lake Andes, a four-hole construction, which has been introduced to the trade this season ; the Active Andes, a sheet flue four-hole range, made in three sizes, and the New Grand, a cheap six hole range. The cook stoves are next considered, and are represented by the Model Andes, for any kind of fuel ; the Anchor Andes ; the Star Andes, a four-hole wood cook ; the Bristol, Girard and and New Reliable. The Art Andes is the leading parlor stove, and is so well known to the trade that special reference to its features of construction is unnecessary at this time. The Crown Andes, a first-class parlor heater, has been improved this season and is offered in two sizes having fire pots measuring respectively 14 and 16 inches in diameter. The Pearl Andes, the Grove Andes, the Magic Andes, the Round Andes, the Iron Andes, Gem Andes, Oak Andes, Cottage Andes, Julian, Sharon, Putnam, Medallion and Salem are some of the other goods which are illustrated and described. An alphabetical index, a list of stoves for which repairs can be furnished, and a price-list of brick, are some of the other features of the volume.

Abram Cox Stove Company.

"Catalogue 1893–94 Abram Cox Stove Company, Philadelphia and Chicago; established 1847, incorporated 1892," is the inscription, in silver-bronze letters, on the front cover of a volume of 144 pages now being distributed to the trade. The back cover has a design in silver-bronze, with the Novelty trade-mark in the center, which enumerates the standard productions of the company. Folded over the cover, to be readily seen, is a loose sheet stating that the offices, showrooms and warehouses have been moved to the foundry, at American and Dauphin streets, where enlarged facilities are enjoyed. An announcement to the trade, terms, special notice, suggestions and some commendatory reference to their ranges occupy the first few pages, after which we find the Messenger Novelty, a handsome range, in the place of honor. This in turn is followed by other popular ranges, the Wayne Novelty, Valley Novelty, right and left oven, New Splendid and Lansdale. Five-hole ranges are next considered, with the Splendid occupying the first place, and then the Ruby, Ionic, Surf and Dot. The New Niagara and Quaker City are flat-top cooks of neat design. A display page heralds cooking and heating goods of interest to architects and builders, and a loose sheet states that the company are agents for the Novelty Circulator and issue a special catalogue of those goods. The Cuisine Novelty is a wrought-steel French range that can be furnished from 30 inches to any length required, and made in all the usual variations of style. The Model Novelty and Novelty Kitchener are cast iron ranges of fine appearance, adapted to the use of either upright or horizontal boilers, and with high and low hot closets. A cut shows the ease of renewing the grate in the Novelty Kitchener. The Novelty Furnace line is led by the original style, followed by the Ideal Novelty, which presents some entirely new features and is made as a combination heater, with steel radiator for soft coal, and with a cast-iron radiator, and for setting in a brick chamber. Some sectional views show the fire pot and grate and hot-water section and the radiating section in such a manner that the movement of the smoke is readily understood. These are followed by the Splendid Novelty, Success, and Success Novelty portable and the Grand Novelty brick-set furnace. The Fireside is an open grate fire-place heater, leading a line of portable grates and fire-place linings. The Radiant Novelty, Parlor Novelty, Palace Novelty and Starling square stoves make up what they claim to be an invincible line of parlor heaters. The Crown Novelty, Aldine Novelty, Marvel Novelty, Oxford, Polo, Magnet and Darby are a line of Russian iron direct draft and revertible flue single and double heaters that are made to meet all requirements. The Dew Drop, Alaska, Dandy, Arctic, Picket and Handy are a line of cast-iron heaters. Several pages are devoted to stove hollow ware, fittings and repairs.

Bussey & McLeod Stove Company

of Troy, N. Y., have issued, under date of July 1, a well-arranged catalogue of Gold Coin stoves, ranges and heaters. The 158 pages of which the volume is composed are bound in flexible covers carrying side titles, embossed in old gold and green bronze upon a groundwork of light maroon. The front cover is embellished with a *fac-simile* of the company's trade mark resting upon an oak branch, while interwoven with the design is their name and address and the date 1893. Across the top of the book is the inscription "Gold Coin stoves and ranges." The fourth page of the cover carries a panel with an old gold border, showing a bird's-eye view of the works on Oakwood avenue, Troy, while above this is a branch of oak leaves and the figures 1893. The printing of the catalogue is well done and the engravings clearly show the decorative features of the stoves illustrated. The goods of the company are well known to the trade under the name "Gold Coin," and are offered in sufficient variety to meet the requirements of dealers everywhere. The new patterns brought out this season and the special features incorporated were fully covered in the review of the Chicago Stove Works, who make the Gold Coin goods for the Western sections of the country.

Southern Stove Works.

We are indebted to Kiechle, Brentano & Oberdorfer, proprietors of the Southern Stove Works, Evansville, Ind., for a copy of their stove catalogue for 1893-4. The volume is made up of something over 100 pages, bound in colored paper covers, with side title in gilt letters. The frontispiece is a general view of the company's warerooms and offices on Seventh avenue, extending from Water to Ohio streets ; while the several pages which follow call attention to the new goods which have been brought out this season ; a telegraphic code, which may be used in ordering supplies by wire ; a statement of the company's guarantee ; terms ; directions for operating and putting up stoves, and to the announcement that the Southern Stove Works make and furnish all odd plates formerly produced by Browneller, Grayville & Co. and Kiechle & Harrison. The lines of specialties presented in the catalogue embrace a pleasing variety of cook stoves, ranges and heaters adapted for different fuels. Our Leader, a four-hole wood cook, is first considered, following which, under the same name, is presented a line of four and six hole ranges. This stove is made in the usual styles and sizes and is one of the latest additions to the company's assortment. The Royal Oak, a six hole range made in two sizes ; the Royal Leader, a four-hole coal cook made in seven sizes ; the Bazar, a four hole coal stove made in two sizes ; the Grand Future, made in two sizes, and the Irondale cook for coal only are also presented. The heaters occupy the latter portion of the volume, and are represented by the Royal Oak for 1893 in the leading position. Next in order is the Leader Oak for wood or coal, and made in four sizes; the Advance Franklin for coal, in two sizes; the Art Leader, a neat cottage parlor stove, just brought out, in three sizes for wood and the same number for coal; the Mikado, a first-class Todd, and a varied assortment

of box, cannon, globe, laundry and cottage parlor stoves. A long list of hollow ware, prices, &c., are features of the closing pages.

ODD PLATES.

THE MANY FRIENDS of Thomas J. Douglass, one of the heating engineers of the Richmond Stove Company, will be grieved to learn of his most serious illness, confining him to his home and withdrawing him temporarily from the field of his accustomed labors.

ONE OF THE GIANT HEATERS, made by D. H. Erdman, Camden, N. J., is being set to heat the primary school at Collingwood, N. J. Mr. Erdman is following his usual custom of spending the summer at his cottage at Island Heights, N. J.

"ANNOUNCEMENT SUGGESTIONS" is the title of a four-page circular from F. M. Borden & Bro., Philadelphia, who for years have made a specialty of stove repairs. The Novelty trade-mark is at the top of the page, and at the bottom is this explanation: "Sales Agency for Abram Cox Stove Company, Leaf Stove Company." The text impresses the necessity of a thorough explanation and description of the repair parts wanted, with the complete name, number and dates on the stoves. Then they give their understanding of the front and right and left sides of a stove. The other three pages show skeleton cuts of a flat-top cook, a high oven range, a five-hole range, a base burner and the Novelty furnace, all having the parts numbered and a list of the correct names with these numbers opposite. This effort should prevent many annoying mistakes and delays if heeded when the fall opens.

HENRY GLEASON, 108 Beekman street, New York, factory agent for three classes of stove trimmings, says that so far his orders are up to the average of last year. He looks for a fall trade of good proportions, for the reason that, according to his observations, based on personal visits to foundries, about the same amount of castings are being put in the sand as heretofore. He explains why, in these times, this is so, by saying that stove manufacturers have been through about five years of experimentation in styles, &c., and have about settled on staple lines that can be safely carried over if necessary.

J. B. BORDEN of F. M. Borden & Bro., Philadelphia, is visiting his brother in Chicago and doing the World's Fair. A pleasure is in store for some of the stove and gasoline goods manufacturers, where he will make some social and business calls.

SCHWAB & SERCOMB of Milwaukee, Wis., favor us with copies of two interesting publications which they have just issued relative to their Gilt Edge furnaces. One of these is entitled "Comfortable Homes." It consists of 64 pages, giving a large number of photo-lithographic views of dwelling houses and churches in various parts of the country which are heated by Gilt Edge furnaces. A treatise on warming and ventilation occupies several pages of the work, giving practical suggestions to those engaged in supplying heating apparatus, and covering such details as draft, instructions for making estimates, setting furnaces, furnace management and how to economically manage a furnace. The Schwab & Sercomb anti-clinker lever movement rocking grate is illustrated and described, and several pages are devoted to sectional views of the Gilt Edge furnace, showing the different styles of construction, as adapted to houses of different sizes, or for burning the various kinds of fuel. The illustrations are of a high order of merit, and the work is remarkably full of details desired by those who are in search of an efficient furnace as well as members of the trade who need data for comparing the Gilt Edge with other furnaces. This publication forms the sixth annual catalogue of Schwab & Sercomb. The second publication is entitled "Comfortable Homes and a List of People who Live in Them." It consists of 48 pages of testimonials of the Gilt Edge furnace, and a long list of names and addresses of the persons who are using it. Illustrations are also given of the furnace.

AN ADVERTISING sign measuring about 8 x 28 inches and made of heavy cardboard has just been distributed to their customers by the Peninsular Stove Company of Detroit, Mich. The sample before us carries in large white letters upon a blue ground the word "Peninsular," below which, upon a white ground, is the inscription, "Sold by J. S. Brubaker." At the left, occupying the full width of the card, is a *fac-simile* of the company's trade-mark printed in blue and white. The entire design is of such a character as to be readily seen at a distance, and the sign suspended in a dealer's store cannot fail to catch the eye of intending purchasers.

THE WROUGHT IRON RANGE COMPANY of St. Louis have just closed contracts for furnishing complete kitchen outfits for the Oriental Hotel at Dallas, Texas; also the Vicksburg Hotel Company at Vicksburg, Miss.

A LOCAL PAPER STATES that the Chattanooga Stove Company of Chattanooga, Tenn., are working a full force, and that the shipment of goods is fully equal to those of previous seasons.

ON THE AFTERNOON OF TUESDAY, August 1, F. & L. Kahn & Bro. of Hamilton, Ohio, shipped 23 carloads of stoves to different sections of the country. A second consignment was made, we understand, the latter part of the same week. This is certainly a gratifying condition of affairs, and indicates that the company's goods are meeting with an active demand.

AMONG the recent appointments by the Governor of Massachusetts was that of Richard E. Warner of Taunton as a member of the Board of Arbitration and Conciliation, in place of Ezra Davol, whose term has expired. Mr. Warner is a member of the well-known firm of White, Warner & Co., who give employment to a large force of hands, and are regarded as one of the most successful and enterprising firms in the country. We understand that Mr. Warner was indorsed for the position to which he has been appointed by leading manufacturing concerns, as well as by many business and professional men.

A CARD COMES to us from J. G. Sorgen, 266 First street, Portland, Ore., manager of the Pacific Coast branch of Hart & Crouse, this firm being successors to Portland Cornice & Roofing Company.

"MIDSUMMER SUPPLEMENT NO. 7" is the name of the neatly printed pamphlet of 44 pages just issued by the Fuller & Warren Company of Troy, N. Y. A good quality of paper is used, and the text is in two colors, making a pleasing contrast. The engravings are up to the high standard characteristic of publications issued by this concern, and clearly show the decorative features. The pamphlet before us describes the new ranges and heaters brought out by the company for this season's trade. The ranges "are in all the styles, sizes and grades known to the trade," and the six leaders are fitted with the maker's patent oval fire box, in which may be used the draw center, the Dockash or the triangular grate. The new ranges are known as the P. P. Stewart, for hard or soft coal or wood; the F. & W. Co., with single oven; the Eastern Stewart, with sheet flue and large, well-shaped oven; the Germania, fitted with the company's system of hot-air circulation and oven ventilation; the Diamond, a low-priced stove; and the Signal Diamond. There are also shown in the catalogue the F. & W. Co. wrought-steel oven range, the Advance and the Rescue, together with the Splendid base burner, the Art Splendid, improved for 1893, the Matchless Diamond and the P. P. Stewart round surface burner, made in a variety of sizes. It is stated that over 2,000,000 Stewart stoves have been made and sold.

THE NATIONAL VAPOR STOVE & MFG. COMPANY of Cleveland, Ohio, made an assignment on Monday, August 7. The names of R. J. Cummer, vice-president of the company, and Thomas Rath, secretary, were on the deed of assignment, making Charles Stone of Oberlin, Ohio, assignee. The assets are said to be estimated at $125,000, and the liabilities at $90,000.

CRIBBEN, SEXTON & CO. of Chicago, Ill., have issued to their friends an interesting World's Fair souvenir. Inclosed in heavy paper covers measuring 3¼ x 5¼ inches is a series of views covering the principal buildings at Jackson Park, Chicago. In connection with each picture is a statement of the ground area occupied and the cost of the building. Backing these views of the World's Fair structures is advertising matter, including illustrations and text. The goods to which attention is invited embrace the Universal line of heaters, prominent among which is the Radiant Universal hard coal base burner, made in three sizes, one of which is provided with oven. Upon the fourth page of the cover is a view of the exhibit of Cribben, Sexton & Co., in Section O of the Manufactures and Liberal Arts Building.

DEHAVEN & CO., LIMITED, Pittsburgh, Pa., are directing the attention of the trade to a parlor stove which they have christened Fairy Cinderella and a cook stove known as Magic Cinderella, both of which have recently been put on the market. The former is referred to as being provided with a new style of direct draft, is made in large sizes and is adapted to the use of either soft or hard coal. The ash pit is extra large and deep, there is a duplex grate with large feed door, deflecting smoke plate, nickel foot rails and name plate, illuminated clinker doors, extra large fire chamber lined high up with fire-flint brick and mounted perfectly air tight. The design of the stove is handsome throughout and it is made in four sizes, the inside diameter of the smallest size being 12 inches and of the largest size 15 inches. The Magic Cinderella is referred to as a handsome and an entirely new coal and wood cook stove. The oven is extra large and high, there are ample flues, draw hearth, large cut top, ash pan, and dump and

shaking (or basket) grate is furnished, as desired. It has heavy sectional linings, tin lined oven doors and extra large nickel and tile doors plates. It is furnished to the trade in three sizes, and inquiries and orders are being received rapidly.

The Rochester S., F. & S. M. W. Association.

We are indebted to secretary D. G. Robbins for the following entertaining account of the picnic of the Stove, Furnace and Sheet Metal Workers' Association of Rochester, N. Y. The picnic, which was the third annual one, was held July 26. With the report sent us we also received a group photograph of the good-looking picnicers. Mr. Robbins' account is as follows :

Resolved, That the secretary be instructed to write to *The Metal Worker* an account of our picnic. Carried.

This edict was issued at our last meeting of the Stove, Furnace and Sheet Metal Workers' Association of this city, which was organized several years ago for the general social welfare of its members. Much good is being done by getting acquainted with each other and finding that business men in the same kind of trade may meet not only in a body, but individually, and discuss matters of prices, stock, work, &c., without that feeling of jealousy which usually exists among business men of the same kind. While but a small percentage of our members attend the regular monthly meeting, a large number attend our annual outings.

Well, I started out to write about it and have been drifting, but here goes: Ticket $1.50, takes you by Bay Railroad to Sea Breeze, then by boat to Newport House dinner, and return same route. Our Executive Committee arranges everything for us, so all we have to do is to follow the leader and do not worry about how we shall have a good time. Our president, the genial, whole souled and lofty John O. Vogel, the president of the John Siddons Company, always goes with us, and every year cuts the watermelons—that is to say, he provides an abundance of the finest watermelons in the market to treat the boys. He calls us all "boys" when we are eating melons. To see the groups of melon eaters, each with his face behind a big slice of watermelon, would make a picture. After eating melons, first in order was base ball, and nines were chosen representing members from the east and west sides of the river, and with our jolly president as umpire the fun begins, and when dinner was called the game stood 30 to 12 in favor of the west siders. Short speeches by the members and for the good of the order followed dinner, and then base ball, boat racing, &c., helped to make the afternoon too short to get us discouraged with the fun, and you may be assured that old and young of our number take part, and never a word or look showing any jealousy or ill feeling between the members. At this, the third outing, the tie that binds seems to grow stronger, and in our every-day life, whenever we meet, the same friendly feeling exists and we look forward to the coming of another outing.

We do not wish to burden your space too much with an account of our association, but I send you names of most of those who attended our last outing, to whom any one may write regarding the association. Many such could be started all over the country and much good come from them.

OFFICERS.

President, John O. Vogel.
Secretary, D. G. Robbins.
Treasurer, F. H. Williams.

EXECUTIVE COMMITTEE.

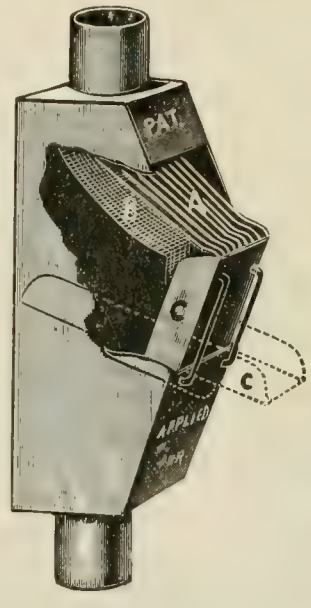
L. Pitchard, John Fricker, M. J Lennon, John Barnett, Rich. Kingston.

MEMBERS.

Albert Will, Frank Callister, John B. Snyder, L E Mason, Geo. Clarke, Henry Hauser, W. H. Harris, Robert Calder, W. B. Bruce, F. S. Slagel, J. H. McConnell, J. H. Myers, I. Kaiser, J. B. Baumer, C. D. Then, J. Flemming, J. Graham, John A. Walter.

Self Cleaning Strainer and Cut-Off.

The accompanying illustration presents a broken view of the self-cleaning strainer and cut-off manufactured by W. C. Hopson & Co., Grand Rapids, Mich. Referring to the illustration, the grating A is to allow sticks, leaves and other large articles to pass off as they are thrown down by the water. The finer sieve B, placed immediately under the grating, strains the water still further and washes into the cut-off C. By dropping this cut-off into the position shown by the dotted lines and sliding it back it forms a complete cut off, making it possible to rinse the roof before allowing the water to pass into the cistern. Both sieves are removable and can be easily replaced in case of accident. These strainers and cut-offs are made in four sizes, 2, 3, 4 and 5 inch.



Self-Cleaning Strainer and Cut-Off.

One of the most singular exceptions to the rule of unsatisfactory business conditions this summer, observes the Cleveland *Leader*, is the great increase in traffic on the Erie Canal and the corresponding improvement in the condition of the boatmen. Nearly twice as much grain has gone to the seaboard by the canal route as was shipped that way in the corresponding part of last year, and freights have been by no means remarkably low. This shows how valuable the canal still is as a safeguard against high rates on the railways between the lakes and the sea, for, if the water route had been closed this summer, grain freights from Buffalo to New York would surely have been a heavy burden to producers of very cheap cereals.

New Publications.

HENDRICKS' ARCHITECTS AND BUILDERS' GUIDE AND CONTRACTORS' DIRECTORY OF AMERICA. 1893-94. 648 pages 7 x 10 inches in size. Published annually by Samuel E. Hendricks Company. Price $5.

This work is specially adapted for the use of builders and contractors, and embraces something over 170,000 names, addresses and business classifications. Its usefulness, however, is not confined to the building trades proper, as the information furnished will prove extremely valuable to many manufacturers and dealers as well. It is in effect a directory so arranged and classified as to cover in a convenient and useful manner every branch of building construction and the industries connected therewith. Among the lists of names contained within its covers may be noted those of architects, carpenters, builders, brick makers, producers of cement, manufacturers of building iron of all kinds; dumb waiters, hot air furnaces, fire-proof building materials; iron and steel roofing, ceiling, siding, &c.; various kinds of lathing; mantels of all sorts; grates, fenders, tile, &c.; mason and builders' materials; painting material; plumbers', gas and steam fitters' supplies; roofers and roofers' materials; steam and hot-water heating apparatus; skylights, sash, doors and blinds, varnishes, ventilators, ornamental iron and wire work, and sidewalk lights; together with the names of car builders, engine and boiler dealers, electric lighting companies, engineers, granite dealers and workers; steam and hot-water heating contractors and stone dealers. A feature of the volume is a carefully arranged index by which any particular branch of industry may be easily and quickly found, while numerous sub-headings greatly facilitate reference. Scattered through the pages of the work are to be found the advertising cards of concerns engaged in lines of business connected with or allied to the building industry.

On Thursday, July 27, the up-river steamer "Columbia" celebrated the one hundred and third anniversary of the running of steamboats between Philadelphia and Burlington by a trial of speed. The trip was made, without the customary stops, in just one hour and seven minutes, the distance being 19 miles. This is in strong contrast to the first time the trip was made, on Tuesday, July 27, 1790, the vessel being the "John Fitch," built in 1788. She left Philadelphia at 10 a.m., with 30 passengers, and reached Burlington in three hours and ten minutes. Congress, then in session in Philadelphia, adjourned to witness the experiment, which was considered foolhardy in the extreme. The boat returned next day. The "Columbia" is a side-wheel steamer that has been doing regular service on the line between the points mentioned for a number of years.

A Fostoria, Ohio, dispatch says that a large number of farmers in that section are feeding their wheat to hogs rather than sell it at the low prices now ruling.

ROOFING AND CORNICE.

Patent Folded Lock-Seam Roofing.

In a recent issue of *The Metal Worker* we described and illustrated a new form of roof seams lately secured by letters patent to the Decatur Steel Roofing & Corrugating Company, Decatur, Ill., and known to the trade as Bonbrake's single-fold standing-seam roofing. The accompanying cuts show the construction of roof seams as used by the same firm in their patent folded lock-seam roofing, also their double-lock cross seam, used exclusively in connecting the steel sheets for this roof. This form of roofing, as illustrated, is said by the manufacturers to be a folded lock-seam roofing that is held secure to the sheeting or roof lath before seaming. It is claimed that the sheets or roof strips may be edged up and cleated, as shown by Fig. 4, stiffens the seam and holds it securely against the 1-inch flange, overcoming the objection of the raw edge at the bottom of the seam, and at the same time preventing buckling in the flange. When finished the seam is unbroken from comb to eave and it is stated has the appearance of a standing-seam tin roof, except that it is higher and stronger. The roofing is put up in rolls, containing material for two squares of laid roofing, unless otherwise ordered, and is made of Bessemer steel. Each sheet, we are informed, is inspected and guaranteed, and care is taken in painting.

Fig. 1.—General View of Cleat.

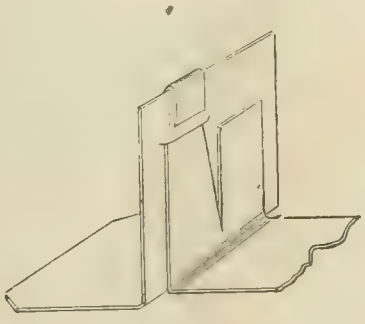


Fig. 2.—First Bend of Cleat.

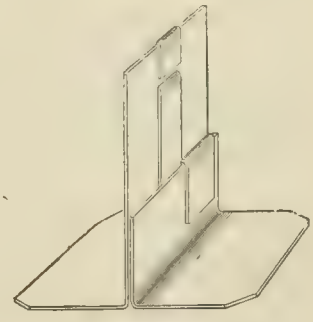


Fig. 3.—Cleat Between Flanges.

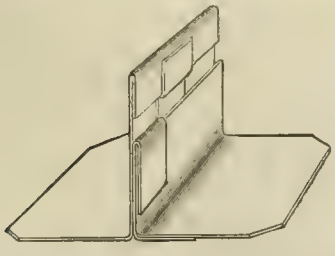


Fig. 4.—First Fold Formed.

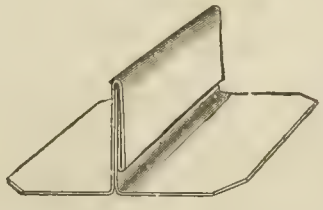


Fig. 5.—Completed Seam.

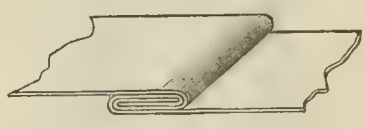


Fig. 6.—Double Lock Cross Seam.

PATENT FOLDED LOCK-SEAM ROOFING.

covering the entire surface to be covered, before seamers are used, and yet be secure and firmly held in position. This feature will be appreciated by roofers generally as an aduantage in case of rain and storm, or when it is necessary to get the building covered quickly. Referring to the accompanying illustrations, Fig. 1 is a separate view of a cleat. Fig. 2 shows the high prong of the cleat passed through the notch and over the edge of the 2¼-inch flange. In Fig. 3 the cleat is in position between the 2¼ and the 1 inch flanges, securing both to the sheeting or lathing. Fig. 4 is similar to Fig. 3 with the first fold formed. Fig. 5 shows the second fold seamed over the 1-inch flange, thus completing the seam. Fig. 6 is a double-lock cross seam. The hem, or first fold turned,

FLASHINGS.

J. Foerster & Son, 806 Fifth street, New York, have recently completed the hipped ventilating skylights, with glazed side sashes, operated with worm gearings from below, on the DeWitt Memorial Chapel, Cannon and Rivington streets, New York; also on the parochial school of St. Boniface's Church, Willoughby street, Brooklyn, N. Y. The firm are at present working on the tin roofing and galvanized-iron cornices and skylights for building corner of Tenth avenue and Twenth-seventh street, this city.

Work was made for the roofers in Camden, N. J., by a recent wind storm, which unroofed several buildings and damaged many others.

The Tin, Sheet Iron and Cornice Workers' Union recently held a meeting in Albany, N. Y., and elected the following officers: President, M. J. Quinn; vice-president, Daniel Powers; recording secretary, John J. Burns; financial secretary, H. H. De Rouville; treasurer, Thomas Gillen; conductor, John Roach; warden, J. Gilmour; trustee, Edward Keeler.

Says a Southern exchange: "The trade of the Chattanooga Steel Roofing Company, Chattanooga, Tenn., is growing, right through hard times and hot weather." The company manufacture a full line of steel and iron roofing and siding, and of roofing paints.

Reports from members of the Iron and Steel Roofers' Association confirm rumors of hard times in that industry. At Canton, Ohio, the principal seat of the industry, there is very little doing. In ordinary times fully 750 tons of black and galvanized sheets are consumed by roofing concerns during one month. It is now stated on good authority that 200 tons would probably exceed requirements. St. Louis manufacturers are in about the same shape. This is usually the busiest season of the year for the roofing trade. A revival is hoped for and confidently expected during the latter part of this month.

The pinch of hard times is being felt even by the leading railroads. President Roberts of the Pennsylvania issued last week an order for reducing the hours of labor in the mechanical department of the railroad from six days a week of 10 hours per day to five days of nine hours each. The order affects all the shops of the Pennsylvania Railroad system, including the leased and controlled lines. This action has been taken with a view to reducing expenses.

THE RETAIL STORE.

Fall Stove Trade.

It is not too early for the local dealer to be considering how he shall get his usual annual profit from this branch of business, particularly when there is a disposition against money outlay. If this revenue is cut off by the unnatural condition of affairs it will be severely felt by many dealers. It will not do, in the face of such a possibility, to depend on ordinary methods to make sales, or to wait to see if the condition will improve. Now is the time for the busy brain to plan a campaign that will be successful in securing what traffic there may be, or a generous share of it. Not the least important feature necessary will be a well-selected line of goods, which must be displayed with a constantly changing attractiveness and must be explained with an enthusiasm that is inspiring, for the old methods are sure to prove disappointing if relied upon this fall.

Mystic Water Filter.

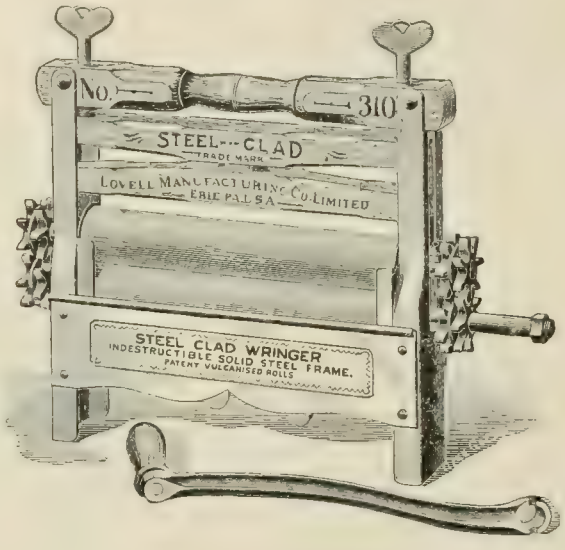
Jones Mfg. Company, Boston, Mass., for whom Edward G. Shepard, 142 Chambers street, New York, is sales

Improved Water Filter.—Full Size Cut.

agent, are offering the Mystic water filter as here shown. It is constructed of cast brass with removable caps and woven wire strainers at each end, all of which are nickel plated. The interior is filled with bone charcoal. It has a waterway as large as the threads will allow, delivering a full, round stream of water, without splattering. Both ends are alike, so that it may be cleansed as often as desired by reversing. When necessary, it may be quickly taken apart and refilled with charcoal and put together by any one. For use on plain bibbs the company furnish a thread attachment. This filter has been designed to meet a demand for an article of this kind at a low price.

Steel-Clad Wringer.

Lovell Mfg. Company, Erie, Pa., W. H. Quinn & Co., 103 Chambers street, New York, agents, are putting the Steel Clad Wringer on the market as shown herewith. The frame of the wringer is made of wrought steel, which, it is explained, is cut, punched and formed with dies, the parts then being riveted firmly together, and the entire frame thoroughly galvanized. To



Steel-Clad Wringer.

the opposite side of the wringer to that shown are attached regular-width swing clamps and clothes guide, all of galvanized metal. The manufacturers state that by this method of construction they are enabled to retain the general form and desirable features of the wood-frame wringers; to overcome their most serious defects, and to produce a wringer frame that is practically indestructible. The point is made that a stronger frame is thus produced without increased weight, one that will not rot or rust, and a wringer easily kept clean. These wringers are made in six sizes, from 10 x 1¾ inch rolls to 12 x 1⅞ inch rolls.

MEMORANDA.

An illustrated catalogue of electrical machinery and general electrical material, just issued by Taylor, Goodhue & Ames of 348 Dearborn street, Chicago, Ill., gives attention, among other things, to the Burton electric cooking devices. These include tea kettles, egg boilers, spiders, chafing-dishes, oatmeal boilers and water kettles. The volume is made up of over 200 pages and is profusely illustrated.

Charles A. Mutton has just established himself in business at 29 West Seventh street, Canton, Ohio, where he will carry in stock a line of stoves and ranges and give attention to repair work.

In "Uncle Sam's" collection from the dead-letter office in the Government Building at the World's Fair, of the things sent by mail the tinner's goods shine brilliantly forth, a battered coffee pot, a teapot and a flour sifter being shown amid jewelry, clothing and provender.

Commenting upon reports about unsuccessful canning enterprises, the *American Grocer* says: "Scores of farmers have become bankrupt and have been forced to sell their estates and personal property, owing to losses in small canning houses. In the Western States small factories and many large ones have sunk money from the start. In California the profitable canning factory is the exception, not the rule. And yet the industry is spreading all over the country, being stimulated by offers of a donation of land by small towns desirous of encouraging new industries. Inexperienced men enter the field and throw unknown brands of staple articles on the market to compete with well known and long established popular brands. Farmers become packers, and profess to be satisfied if the result of their work shows that they have obtained more per acre from raising vegetables for canning than if they had raised wheat or corn. Canning is a science, and so is the art of cooking. Factories require trained men and large capital, and unless these are available it is folly to start new packing enterprises."

Judge Lacombe of the United States Circuit Court of New York, in the case of an alleged contract laborer who was sent back to Bremen by the Commissioner of Immigration, but for whose detention a writ of *habeas corpus* had meanwhile been obtained, decided that immigrants sent back to Europe are within the jurisdiction of the commissioner until landed on the other side. The man will therefore be brought back at the expense of the Government in order that the case may be tried in the United States Courts.

TRADE REPORT.

The Iron Market.

The enormous restriction of business is well reflected in the returns of the blast-furnace capacity active on the first of this month, when the weekly production had fallen to 107,042 tons per week, or 67,000 tons below the record of June 1. Since the beginning of the month additional stoppages have taken place, and we are probably now not running much above 100,000 tons per week, against 180,000 to 185,000 tons, which is the record in active times.

In all lines ready money can command its own basis of settlement, but, unfortunately, cash customers are very scarce now.

While a larger volume of business is confidently looked forward to at an early date, the conviction is gaining ground that it will take a long time to get over the havoc created during the past three months, and that the profits of the balance of the current year will contribute very little toward repairing shattered fortunes. Far-sighted business men fear that before the industry has recovered from the effects of the financial cyclone it may suffer renewed blows through tariff agitation. A long period of low values is looked forward to, even if financial affairs improve steadily from now on, which is the best hoped for.

Transactions of magnitude are so rare nowadays that little opportunity is afforded to report concerning prices and sacrifice sales practically monopolize the markets. Under the circumstances, quotations are nominal, and are only the starting point for negotiations.

One point seems to be brought out very rarely, and that is that accounts are being steadily reduced, and that, therefore, the amounts due for merchandise must be liquidating quite rapidly, while no new engagements are being entered into.

Pig Iron.—The New York market is quiet and weak, there being urgent sellers and a very slack demand. We quote Northern brands $14 @ $15 for No. 1; $13.25 @ $14.50 for No. 2 at tidewater. Southern Iron, same delivery, $13.75 @ $14.50 for No. 1; $12.25 @ $13.25 for No. 2; $12 @ $12.25 for No. 3; $12 @ $12.25 for No. 2 Soft, and $12.50 @ $13 for No. 1 Soft.

Advices from Philadelphia report that there is no market of any account for Pig Iron at that center, transactions being confined to small lots to cover temporary requirements. In such cases prices are about in line with the figures named below, but in larger lots, or in forced sales, new elements have to be considered, which makes quotations an entirely different matter. The falling off in consumption has been heavy enough to more than offset the decrease in production, so that even if things get better it will take time to stiffen prices. But there is thought to be nothing seriously wrong in the Pig Iron situation. Anything like a fair demand would easily absorb the present supply, and there is no reason to suppose that it will be delayed very much longer. For the present, however, sales are made in small lots at about the following prices for Philadelphia delivery or its equivalent :

American Scotch, No. 1X...	$16.00	@	...
American Scotch, No. 2X...	15.00	@	....
Standard Penna. (Lake Ore), No. 1x.	14.75	@	$15.25
Standard Penna. (Lake Ore), No. 2x.....	14.00	@	14.50

The Pittsburgh market does not show any improvement either in demand or prices, any change in the latter respect being wholly in the direction of lower values. The furnace operators realize that restriction of output is the only safeguard just now, and following out this policy, production of Pig Iron in Allegheny County has been cut down over 10,000 tons per week within a short time. In the Mahoning and Shenango valleys production is being cut down, and will be further reduced before this month is out. Blast furnace labor in the valleys has been reduced from 15 to 20 %, taking effect on the 15th inst. In Foundry Irons there is nothing doing, and will not be until there is greater activity among the mills. Quotations are as follows :

No. 1 Foundry	13 00	@	13.25, cash.
No. 2 Foundry	12.00	@	12.25 "
Charcoal Foundry No. 1	15.00	@	16 00 "
Charcoal Foundry No. 2	14.00	@	15.00 "

A better inquiry is reported from Chicago as coming in from the country trade, and there is thought to be good ground for the belief that a great deal of Iron will be bought in the near future. Some considerable buying has been done, although the feature of it has been that sellers have been willing to contract for long delivery at prices now ruling, showing that they do not take a hopeful view of the future. Recent inquiries for Charcoal Iron have awakened consumers to the fact that but a limited quantity is available for future delivery during the latter half of the year. Should trade in this direction receive any stimulus it would seem that a sharp advance in Charcoal Iron is in order. The following quotations are subject to concessions for prompt cash and immediate shipment :

Lake Superior Charcoal.....	$16.00	@	$16.25
Local Coke Foundry, No. 1...	13.50	@	14.00
Local Coke Foundry, No. 2...	12.75	@	13.00
Local Coke Foundry, No. 3...	12.50	@	12.75
Local Scotch.....	14.00	@	15.00
Ohio Strong Softeners.....	15.75	@	16.25
Southern Silvery, No. 1.		@	14.50
Southern Silvery, No. 2		@	14.00
Southern Coke, No. 2.....	12.60	@	12.85
Southern Coke, No. 3	12 10	@	12.35
Southern, No. 1, Soft.....	12.60	@	12.85
Southern, No. 2, Soft.....	12.00	@	12.25
Tennessee Charcoal, No. 1...	16.00	@	16.50
Alabama Car Wheel.....		@	18.85
Hocking Valley, No. 1 ...:	15 25	@	15.50
Jackson County Silvery.....	16.50	@	17.00

The Southern Pig Iron market shows no improvement, the depressed financial situation dominating the trade, which in some respects is worse than ever. Cash buyers can obtain Iron almost at their own prices, but there is little more than a single car lot demand, and while the offerings are not large, they are abundant for the wants of the trade. The sales of Iron to be consumed locally have been the smallest of any week this season, and they have been only moderately supplemented by some sales for the North and East. Quotations are given as follows :

Foundry.

Southern Coke, No. 1.	$12.75	@	$13.00
Southern Coke, No. 2.....	11.25	@	11.50
Southern Coke No. 3.....	10.75	@	11.00
Ohio Soft Stone Coal, No. 1....	15.50	@	16.00
Ohio Soft Stone Coal, No. 2....	14.50	@	14.75
Lake Superior Coke No. 1.....	15.00	@	15.25
Lake Superior Coke No. 2.	14.00	@	14.25
Hanging Rock Charcoal, No. 1..	18.50	@	19.00
Hanging Rock Charcoal, No. 2..	17.50	@	18.00
Tennessee and Alabama Charcoal, No. 1.....	14.75	@	15.00
Tennessee and Alabama Charcoal, No. 2.....	13.75	@	14.00

Car Wheel and Malleable Irons.

Standard Southern Car Wheel	17.75	@	18.00
Lake Superior Car Wheel and Malleable.....	17.25	@	17.50

Metal Market.

Pig Tin.—Sales to interior dealers and consumers have been rather below the average for the season. The straitened financial condition of many buyers and heavy carrying charges have, it is said, offset the improved change in the statistical position of the metal. The possibility of removal of the duty on Pig Tin at a not very distant date induces caution in buying on the part of consumers, unless for absolute needs, and these are smaller than is usual at this season. The price for spot Tin has fallen about ¼¢ during the week. The following interesting remarks appeared in the Metal Exchange circular of August 8: The official returns of the United States Bureau of Statistics

give the following figures for the fiscal year ending June 30, 1893:

Total importation of Tin into the United States....	61,076,464 lb.
Of which were re-exported.	231,204 lb.
	60,845,260 lb.
Of which were imported into Pacific ports.....	2,680,777 lb.
Leaving a net importation of.....	58,164,483 lb.
Equal to.....	25,960 tons

of 2240 lb. for the United States, excluding the Pacific ports.

According to these figures the consumption of the United States for the year ending June 30, 1893, has been as follows:

Stock, June 30, 1892.....	3,800 tons.
Import for year ending June 30, 1893, excluding Pacific ports.	25,966 tons.
	29,766 tons.
Stock in United States, excluding Pacific ports, June 30, 1893	9,910 tons.
Consumption for year ending June 30, 1893, excluding Pacific ports.....	19,856 tons.
Imports into Pacific ports during the year, taken as consumed there, 2,680,777 pounds, equal to.....	1,197 tons.
Total.....	21,053 tons

foreign Tin consumed in the United States during the year, as stated above.

These figures are a further proof of the correctness of the monthly statistics compiled by this exchange. The latter with the beginning of this year took the consumption of the United States:

Excluding the Pacific ports, at an average of.....	1,600	tons per month;
the actual consumption 19,856 tons per year gives an average of...	1,655	tons per month.

Copper.—Lake Superior Ingot has been offered at as low as 9¾¢ ℔ lb for large lots on the Metal Exchange for August and September delivery. The terms were net cash. A few small parcels have been sold at very near to that price from second hands. As a rule, producers' agents claim that anything below 10¢ is the exception, but there is enough outside selling and offering to make it very difficult to maintain prices on the basis of 10¢ for this month delivery. Hardly as formidable competition has, however, developed in the cheaper varieties of the metal. Business on the whole continues light and slow, and such demand as there is consists in small spot lots. Prices show some sign of weakening. Small lots of Lake Ingot Copper are quoted at 11¢; Ansonia grade Arizona at 10⅛¢, and Ansonia grade casting at 10¢, while for spot cash even these figures might be shaded.

Sheet Copper.—The demand remains unchanged in its dullness. Small orders only are received by jobbers. The comparative stagnation in the building trade which exists just now has been acutely felt in the market for Sheet Copper, which shows far less movement than should be the case at this time of the year.

Pig Lead—Slow business and the same weak and unsettled conditions as prevailed last week continue. Under the financial pressure some holders have parted with stock at 3.25¢ @ 3 30¢. As far as could be learned, about 500 tons went at those figures, nearly if not all of which was taken by consumers for prompt delivery or immediate shipment. That the purchases could be duplicated is not clear, but the indications at this writing are that 3.30¢ stands as selling price for ordinary Western in round lots, or, at least, the best at which round lots can be placed for prompt or current-month delivery. For small lots 4¢ for American Pig represents the ordinary selling price. Jobbers report that business in Pig Lead and Lead products has, on the whole, been surprisingly good all this year and has shown slight sympathy with the general business depression. Prices have remained firm and a constant current demand, mainly for small lots, has kept the trade moving. A falling off during the latter part of this month will not, however, be entirely unlooked for. Stocks are, nevertheless, very low throughout the country, and the indications are for a fair to moderate business until the fall.

Sheet Lead and Lead Pipe.—Business is reported as good. Plumbers' requirements appear to be as large as at any time previous. Prices remain unchanged at former quotations.

Spelter.—Consumers who purchase in this market have been extremely indifferent buyers the past week. Lower prices named by sellers have failed to arouse interest in the slightest degree, and, to all accounts, immediate wants have necessitated none but very commonplace purchases.

Sheet Zinc.—Business flat in this material. Except for small and fitful orders, of a hand-to-mouth nature, there would be practically nothing doing. Prices are unchanged at 6¼¢ for 600 lb casks, and 7¢ ℔ lb for small lots.

Tin Plates.—There is no improvement in the demand for any class of Plates. The market is principally a retail one, and shows a soft tone all along the line. Ordinary Coke Plates have been so'd at 2½¢ @ 5¢ below the popular quotations. Bright Charcoals and Ternes have passed out at similar concessions. Ordinary requirements are exceptionally small, especially those of can makers, who have in many instances canceled contracts for Plates in consequence of their orders being cut down. Packers and canners, although having good crops to handle, are unable to utilize them in most cases, through inability to procure the necessary funds to pay for materials and labor. Roofing Plates are in moderate demand, but even these fall far below expectations. Those which are taken are mostly of domestic make, imported Ternes being stagnant. The shipments of Tin Plates from Wales are very light, and few orders are being placed on the other side. As an instance of the depression it may be mentioned that one prominent firm of Tin Plate brokers, who normally handle some 3000 boxes of Tin Plates daily, recently stated that there were days when they did no business at all to speak of. A London cable of August 9 reports on the English market as follows:

In the market for Tin Plate there has been very little change. Some sellers note rather better inquiry, but bids are invariably very low and operators inclined to postpone business as much as possible, pending better reports from America. The mills are indifferently employed and makers are not forcing sales, owing to lowness of prices. Exports last month were 33,000 tons, against 31,000 tons in July, 1892. Shipments to the United States, 22,000 tons and 24,000 tons respectively. Liverpool prices are as follows:

IC Charcoal, Alloway grade.....	13/0 @ 13/6
IC Bessemer Steel, Coke finish. ...	12/0 @ .. .
IC Siemens " " "	12/3 @ ....
IC Coke, B V. grade, 14 x 20.....	11/9 @ 12/
Charcoal Terne, Dean grade.....	11/9 @ 12/

Sheet Iron.—The market for Black Iron is practically at a standstill, except for such business as is done directly with the mills by large consumers. Prices are quoted at ¼¢ to ⅛¢ a lb lower all along the line, and spot cash would secure considerable concessions. There are, moreover, no signs of any improvement while general business remains in its present unsatisfactory condition; or at any rate before October. Galvanized Iron shows some improvement. A fair general demand for this material is reported; but mainly in smallish lots for prompt shipment. Little forward business is done. Russia Iron is quiet at unchanged prices. Jobbers are trying to place orders for arrivals this month or next. Contracts for arrivals can be made at much less than spot prices for approved assortments.

In order to keep in line with the policy of their competitors for retrenchment of expenses under present condition of business, the Ætna-Standard Iron & Steel Company, large manufacturers of Iron and Steel Sheets and Bars at Bridgeport, Ohio, have been compelled to make a general reduction in wages, which affects officials of the concern as well as employees. Owing to a very large shrinkage in values of manufactured products, particularly iron, manufacturers throughout the West have been compelled to pursue this course in order to more nearly equalize costs with present selling prices. For the purpose of meeting any urgent demands on the part of their customers, and also to assort up their stocks, the Ætna-Standard Iron & Steel Company have started up three of their light Sheet mills and will, therefore, through their period of idleness be able to meet any ordinary call for supply of stock material. The firm have not fixed any date for general resumption of work.

The Palace Regal Ventilator is the name of a stove to which particular prominence is given in the announcement elsewhere of E. Bement & Sons, Lansing, Mich. The special features of this Stove are alluded to, and its efficiency is commented upon.

Chicago Report.

Scrap.—Buying prices have been again marked down by the dealers, and are now as follows :

	Per net ton.	Per lb
No. 1 Wrought Scrap	$8.00	....
Machinery Cast	6.00	....
Malleable Cast	6.00	....
Stove Plate (free of burnt)	5.00	....
Burnt Iron and Grate Bars	4.00	....
Sheet Iron and Hoops	3.00	....
Plow Steel and Breaking Stock	6.00	....
No. 2, such as Shovels, Hoes, &c	4.50	....
Old Boilers—whole (Iron)	6.00	....
" (Iron)—cut in single Sheets and Rings	9.00	....
Old Gas-Pipe and Boiler Tubes	5.00	....
Cast Borings	3.50	....
Turnings	5.00	....
Horseshoes	9.00	....
Copper Bottoms	....	5½¢
Copper Clips and Heavy	....	6½¢
Heavy Brass	....	6 ¢
Light Brass	....	4 ¢
Pipe Lead	....	2½¢
Tea Lead	....	2 ¢
Zinc	....	2¼¢
Rubber	....	2 ¢

Anthracite.—Dealers report no life to trade. They continue to quote carload lots of 12 net tons as follows:

	Grate.	Egg, Sto. and Ch.
Chicago, Ill	$5.85	$6.10
Milwaukee, Wis	5.85	6.10
Kansas City, Mo	9.05	9.30
Council Bluffs, Iowa	9.05	9.30
Lincoln, Neb	9.20	9.45
Sioux City, Iowa	9.05	9.30
Aberdeen, S. Dak	9.10	9.35
Dubuque, Iowa	7.15	7.40
Madison, Wis	7.35	7.60
St. Paul, Minn	8.35	8.60
Burlington, Iowa	7.35	7.60
Des Moines, Iowa	8.80	9.05
Davenport, Iowa	7.15	7.40
St. Joseph, Mo	9.05	9.30
Leavenworth, Kan	9.05	9.30
Omaha, Neb	9.05	9.30

Colorado Anthracite.

COLORADO FUEL & IRON COMPANY.

Denver	$8.00
Pueblo	8.00
Colorado Springs	8.00
Leadville	8.00
Cheyenne, Wyo	10.00
All points between Denver and Missouri River	9.35

A DECISION was recently filed in the United States Circuit Court by Judge Coxe, in the suit of the Steam Gauge & Lantern Company of Syracuse, and the R. E. Dietz Company of New York City, against the C. T. Ham Mfg. Company of Rochester, in which the court orders a decree against the defendants for an injunction and accounting. The court decides that the "feature which distinguishes the Higgins lantern from all preceding tubular lanterns is that the glass globe is mounted in a separate frame and tipped over from the burner laterally without disintegrating the tubular frame or the globe holding the frame of the lantern. No one had done this before. The advantages of the tilting globe over many, if not all, of the previous structures, are obvious; a number of inventors were seeking to secure these advantages, but Higgins was the first to do so by introducing this feature successfully into a tubular lantern. He is, therefore, entitled to protection."

THE NATIONAL HANDY ARTICLE CO. have begun the manufacture of specialties at Grand Rapids, Mich. Among other articles, they are turning out the Security Dust Pan and the Duplex Mop Wringer. They use special machinery, and have equipped a factory at the corner of Louis and Campon streets. John L. Smith, formerly of the firm of Smith & Sanford, is secretary of the company.

CONDITION OF THE

Hardware Trade.

THERE is very little change to note in the condition of the Hardware trade during the week. Buyers, large and small, are confining their purchases strictly to their immediate requirements, and manufacturers are everywhere reducing their production to as low a point as they can. Those who have many goods on hand are generally shut down. Manufacturers and jobbers are making very little effort to force goods on the market, there are few travelers on the road, and the business which is being done is confined to orders to complete assortments. While collections are still slow, we hear many reports of improvement in this respect.

Advices from Chicago.—The Hardware trade generally shows no signs of improvement, but on the other hand it does not continue to fall off. A very steady movement has been in progress for the last two or three weeks. The merchants appear not to be worrying over lack of trade, however, as they state that they would not care to put out large lines of credit under existing financial conditions. They are now patiently waiting for the tide to turn, which they think will probably occur after the crops of this season are safely housed. Collections are fairly good, as debtors are liquidating as rapidly as possible.

Parkhurst & Wilkinson have opened their Heavy Hardware jobbing establishment under the assignee. They hope soon to take the business out of the hands of the assignee by making an arrangement with their creditors for time payments. The firm are confident that they will be able to pay their creditors in full and express their intention not to ask for a compromise.

Notes on Prices.

Cut Nails.—During the past week inquiries from all sections have been extremely light. Most of the mills are closed, and production continues very small. Quotations still rule at $1.05 for carload lots at mill, but Nails have been offered at lower prices, and concessions can be obtained without difficulty on desirable orders. Small lots from store in New York are held at $1.30.

Advices from Chicago.—This branch of trade is in the same condition as reported during the last few weeks, only small quantities being called for from the factories, and the old prices prevailing of $1.20 to $1.25, according to quantity. Assortments in factory warehouses are being broken, however, and some of the manufacturers will have to start operations soon to keep up stocks. Jobbers report a light trade, with prices unchanged at $1.25 to $1.30, according to quantity.

Wire Nails.—Negotiations for an agreement among the makers for the regulation of this business are still progressing. Mills are generally closed, although stocks in their hands are small. The regular quotation for carload lots at mill remains unchanged at $1.35, but, as we noted last week, this price is shaded.

Advices from Chicago.—Arrangements were practically consummated at the meeting of the Wire-Nail manufacturers last week for the formation of a pool to control the output of Wire Nails, and in this way limit the production to the actual requirements of consumers. The manufacturers hope to thus regulate prices, and avoid the ruinous rates which prevailed throughout the country this spring. A meeting is to be held this week to complete the arrangement and perfect some details for carrying it out. In the meantime prices are maintained at $1.45, Chicago, for factory lots, and the makers are restricting their terms to 2 per cent. off for cash, or 10 days' time instead of the usual 60 days. The factories are expected to continue shut down during the whole of August, so as to clean up stocks in the different warehouses. Jobbers report their prices unchanged at $1.55 to $1.60 from stock, according to quantity.

Barb Wire.—Trade is extremely light in Barb Wire, and quotations remain nominally at $2.45 to $2.50 for carload lots of Four-Point Galvanized at mill, small lots from store being held at the usual advance. The Continental Wire Company, St. Louis, under date of August 1, send out quotations shading these prices 15 cents "to close out stock on hand."

Advices from Chicago.—There is a great deal of competition for the small business now in sight and prices have receded considerably. The manufacturers are selling for shipment from factory at $2 for Painted and $2.40 for Galvanized, while even this is not a fair price when sales are made in competition with St. Louis manufacturers. Jobbers report a better demand from the farmers with sales of small lots from stock at $2.20 to $2.60 respectively.

Metal Mat.—Joshua Horrocks, 45 Cliff street, New York, is offering his Metal Mat from the following list, subject to a discount to the trade of 50 per cent.:

No.	Each.
1, 16 x 24	$2.00
2, 18 x 30	2.50
3, 22 x 36	3.50
4, 24 x 48	5.00
5, 30 x 48	6.00
6, 36 x 48	7.00
7, 36 x 60	9.00
8, 36 x 72	11.00

Extra sizes, 90 cents per square foot.

Steel-Clad Wringer.—This wringer is put on the market by the Lovell Mfg. Company, Erie, Pa., for whom W. H. Quinn & Co. are agents, 103 Chambers street, New York. The Wringer is sold from the following list, which is sub-

ject to a discount of 12½ per cent. to the trade:

Size numbers.	Size of Rolls.	Per dozen.
310	10 x 1 3/4	$32.00
312	11 x 1 3/4	38.00
314	12 x 1 3/4	44.00
316	10 x 1 7/8	38.00
318	11 x 1 7/8	44.00
320	12 x 1 7/8	52.00

Rope.—Although at this season of the year transactions in Rope are light, and this year more so than usual, prices have been reduced about ¼ cent per pound. We quote for Rope of 7/16 inch diameter and larger as follows:

	Cents.
Manila	8
Sisal	6½
New Zealand	6¼

Double-Pointed Tacks.— Manufacturers of this line are now offering them at lower prices. Quotations run from discount 90 and 10 per cent. to 90 and 10 and 10 per cent.

Glass. — Representative New York wholesale dealers in both domestic and imported Glass state that their sales for the month of July ran ahead of those for the corresponding month last year. Conservative customers of these concerns are reported as ordering only what they need, and what they are able to pay for; and probably would not buy for speculative purposes if Glass was offered at half the present price. This course of action is looked upon as an encouraging feature in the present financial situation. There is a continual consumption of Glass in a limited way throughout the country for repairs and small improvements, the outlay for which is small in individual cases, yet in the ag gregate amounts to a large sum. Prices on American and imported Window Glass remain unchanged. We quote prices unchanged, as follows; American Window Glass, less quantities than carloads, 80 and 10 per cent. discount, f.o.b. at shipping point. French Window Glass, 75 and 10 and 5 per cent. discount. American Plate ranges in price from 50 and 10 and 7½ per cent. discount to 60 and 5 per cent. discount. Imported Plate Glass, 60 per cent. discount to 60 and 10 and 5 per cent. discount.

Old Rubber.—The following represents the prices paid for Old Rubber delivered in New York, except as otherwise stated, prices being fairly steady, with a dull market:

Car Springs, ton lots, ℔ lb.	@	$0.03¼
Rubber Shoes, carloads, delivered at factory, ℔ lb.	@	.03⅜
Rubber shoes, less than carloads	@	.03
Large Hose, ℔ ton	@	9.00
White Wringer Rolls, ℔ lb.	@	.04¼
White Wringer Rolls, good grade	@	.05
White Syringes, ℔ lb.	@	.05

Old Rags, Paper, &c.—The demand has been limited, but prices remain steady at about the following quotations, delivered in New York:

No. 1 White Rags	3⅝	@ 3⅞¢
No. 2 White Rags		@ 1¾¢
Mixed Rags		1¼¢
Blues and 3ds		1¾¢
Hard Sized White Shavings		2¾¢
No. 1 White Book Shavings		@ 2½¢
No. 2 White Book Shavings	1½	@ 1¾¢
Light Book Shavings	⅞	@ 1¢
No. 1 Mixed Shavings		1¢
No. 2 Mixed Shavings		½¢
No. 1 Printed Books	1	@ 1½¢
Ordinary Mixed Books	½	@ ¾¢
Newspapers		½¢
No. 1 Manila Paper	1¼	@ 1½¢
No. 2 Manila Paper	⅞	@ 1 ¢
Bogus Paper	¾	@ ⅞¢
Common Paper	⅝	@ ¾¢
Straw Chips	½	@ ⅝¢
Binders' Clippings	½	@ ⅝¢
Jute Butts		1½¢
No. 1 Jute Bagging		@ 1½¢
Mixed Bagging		1¢
No. 2 Bagging		¾¢
Hemp Twine		2½¢
Manila Rope		2½¢
Jute Rope	1½	@ 1¾¢
Mixed Rope	¾	@ ⅞¢

Old Metals.—There is little movement in Old Metals, prices depending largely upon special conditions of purchase or sale. The following show fairly the current quotations in New York:

Heavy Copper		9½¢
Light and Tinned Copper		8½¢
Heavy Brass		7¢
Light Brass		6¢
Lead		3½¢
Tea Lead		3¼¢
Zinc		2¾¢
No. 1 Pewter		14¢
No. 2 Pewter		7¢
Wrought Scrap Iron	gross ton,	$13.00
Heavy Cast Scrap	gross ton,	9.00
Stove Plate Scrap	gross ton,	6.00
Burnt Iron	gross ton,	4.00
Mixed Bagging		1 ¢
No. 2 Bagging		¾¢
Hemp Twine		2½¢
Manila Rope		2¾¢
Jute Rope	1⅞	@ 2 ¢
Mixed Rope	¾	@ ⅞¢

Trade Notes.

The Western Electric Heating Company were recently incorporated at St Paul, Minn., with a capital of 1,000,000.

In our last issue reference was made in these notes to a new advertisement of the Illinois Roofing & Supply Company of Chicago. The presumption at that time was that the advertisement had been inserted. Owing, however, to the non-arrival of an electrotype it was thrown over to this week. This explanation is due to those who may have observed the lack of correspondence between the item and advertising pages.

John S. Brooks of 235 Fifth avenue, Brooklyn, has opened a Patent Department in his stove store, and states that his 30 years of practice at the Patent Office enables him to prosecute applications with success, especially in the line of stoves and sheet-metal work, in which he has taken out 20 patents for himself and made out the papers for them and many other applications for other parties, losing but a single case so far.

W. H. Stewart, 182 Front street, New York, makes Liquid Asbestine Fire-Proof Composition which is largely used by furnacemen for pasting asbestos paper on furnace pipes.

The foundry of Barlow, Condit & Morris, Newark, N. J., is located in exactly the same place where Seth Boyden commenced to experiment in the production of Malleable Iron Castings in 1826. Daniel Condit, of the present firm, became associated with Mr. Boyden in 1836, and the business has been in the families of the present owners ever since. In addition to turning out Malleable Castings that are ordered from all sections of the United States, they turn out soft, smooth Gray Iron Castings. As is natural with a plant that is frequently called the home of the Malleable Iron Casting, many interesting reminiscences have accumulated there bearing on the attempts to produce Castings by various novel processes.

Macknet & Kenely, managers of the United States Rocking Grate Bar Co., Newark, N. J., send in a neat pamphlet bearing the inscription: "A clean fire is the base of all fuel economy." It describes the grate and contains cuts showing its construction, adaptability and operation, from which a clear idea of its merit can be gained. Claims are made as to its efficiency and a number of references given. In construction it consists of a number of "saddles" or coal-bearing pieces that rest on a series of bars so connected that a lever readily moves every part of the grate.

W. G. Morris of Barlow, Condit & Morris, Newark, N. J., is enjoying a vacation at the Delaware Water Gap, being the first time he has left the malleable and gray iron foundry business for a genuine recreation for 25 years.

The Britton Rolling Mill Company, Cleveland, Ohio, are operating their plate mill and turning out 50 to 60 tons per day. Their sheet mills are not running at present. Engines and other machinery for two black plate mills for tinning are on the ground, but will not be erected until the present unsettled condition of national affairs is changed.

The works of the American Sheet Iron Company, at Phillipsburg, N. J., have started up after an idleness of nearly two months.

Sidney Shepard & Co., extensive manufacturers of stamped ware at Buffalo, N. Y., have reduced their working force one-half. When running full 400 men are employed.

The Vienna Enamel & Stamping Works, at Chesterton, Ind., have shut down indefinitely, throwing 150 men out of employment.

In an announcement elsewhere in this issue E. E. Dempsey, 109 Lafayette avenue, Syracuse, N. Y., directs attention to the Giant Safety Combination Furnace, which burns kerosene as well as gasoline on a new principle. The weight of the furnace is 7½ pounds, and it is made of copper and sheet steel. It is said to run six hours without pumping, and with a pint of oil can be run for ten hours.

Stransky & Co., 27 Murray street, New York, are manufacturing a Stove Mat for use on kitchen ranges, cook stoves, &c. It consists of a sheet of asbestos, circular in form, with a rim of tin, the whole article being 9 inches in diameter. The rim is kept in place by means of holes pricked in with a center punch. Instead of a wire ring riveted on with which to hang it up when not in use, an eyelet sufficiently large is passed through the asbestos, thus enabling it to be packed closely for shipment. These Mats are placed on the top of cook stoves to keep milk, chocolate, cereals, &c., from boiling over or scorching, and can also be used for making toast.

Samson Cordage Works, Boston, have engaged as their direct representative C. M. Avery, who is well and favorably known to the jobbing trade. The company report their works in full operation, with a fair demand for goods for early shipment.

CORDLEY & HAYES, 172 Duane street, New York, sole agents for United Indurated Fiber Company of New Jersey, in announcing the total destruction by fire of the Lockport, N. Y., factory on July 29, say, under date of August 4, that they have already a force of men at work clearing the ground on a new location adjoining their old plant. This tract of 9 to 10 acres, recently purchased, they say will be partially covered by six new buildings, each averaging 50 x 200 feet in size, and their contracts call for the completion of them in 60 days. They assure the trade they are confident of being in a position not only to turn out goods within three months, but in rebuilding have provided for a 50 per cent. added production, which will enable them in the future to be more prompt in the execution of orders.

SOME OF THE WORKMEN of the Lalance & Grosjean Mfg. Company's rolling mill, at Harrisburg, Pa., proposed last week forming a branch of the Amalgamated Association. On hearing of their intention, the manager informed them that the mill would be shut down pending their decision. The men then held a meeting, with the result of relinquishing their project.

E. BISSELL, SON & CO., 12 Murray street and 15 Park Place, New York, will, on Thursday, August 17, conduct an important sale of Gray Enameled Opal Ware, Granite Iron Ware and Blue and White Ware, by order of the Lalance & Grosjean Mfg. Company and the St. Louis Stamping Company. As will be noted by referring to their Special Notice on another page, the goods will be sold in case lots, packed ready for shipment, and will consist of a complete line of Tea and Coffee Pots, Wash Basins, Tea Kettles, Convex, Berlin, Lipped and Climax Saucepans and Pots, Preserving Kettles, Dish, Milk, Pudding and Fry Pans, &c. A large line of Shoe and Cloth Brushes, first quality, will also be disposed of.

AN ILLUSTRATED AND DESCRIPTIVE CATALOGUE of the Richmond steam and hot water heaters is issued by Isaac Coffin & Co., 52 Sudbury street, Boston, Mass. The publication is a neat volume of 40 pages, and describes the Richmond heaters with the aid of both sectional and general illustrations. No attempt is made to explain in detail the different systems employed in the construction of the Richmond apparatus, but only an outline sketch of the heater is given. In addition to the catalogue portion, which also comprises lists of sizes and prices, a number of different patterns of radiators are illustrated and a list of testimonial letters and references is presented.

THE FACTORY of the Lalance & Grosjean Mfg. Company, at Woodhaven, L. I., and their rolling mills at Harrisburg, Pa., will be closed down indefinitely after to-day, throwing 1700 persons out of employment. Vice-President A. J. Cordier stated to a representative of *The Metal Worker* that the firm had been unwillingly constrained to take this course on account of the dullness of trade and diminution of the volume of orders, which did not justify them in piling up a greater amount of stock than is already held, especially in view of the possibility of tariff changes affecting their special productions.

A new instrument has been constructed under the auspices of the German Government Telephone Department, by which it is intended to control the duration of telephonic conversations and to measure the time occupied. It is called a telephonometer, and registers automatically the time of each conversation from the time of ringing up of the exchange to the ringing off signal. By this means it will be possible to reduce the rentals of telephones to a scale according to the service, instead of a fixed charge to a constant or desultory user alike.

Electric Cementation of Steel.—The influence of electricity on the cementation of steel seems likely to throw light on the physics of the process. M. Jules Garnier has recently published the results of his first experiments in this direction, in which a current of electricity was made to form a circuit with the carbon packing as anode and the iron to be hardened the cathode. Both the metal bar and the carbon were inclosed in a tube, which was placed horizontally in a small reverberatory furnace and heated during the experiment, his idea being that the heat would determine the mobility of the carbon, while the electric current would determine the direction of motion of the carbon atoms. The minimum voltage to overcome the resistance was employed, and in one experiment the conditions were 7 volts 35 ampères and 3 hours at a temperature from 900° C. to 1000° C. After the experiment the bar was examined and the cementation was found to have penetrated to a depth of 10 mm. In a second experiment two bars of metal formed the two electrodes, and were separated by a carbon packing of about 10 mm. In this case, with a current of 55 ampères, at a pressure of 2.5 volts, after three hours' heating, the anode bar remained unchanged, while the cathode was hardened to a considerable extent on the side opposed to the anode. It suggested that the cathode should be rotated during the process, and thus secure a uniform action. The rapidity of the process should more than compensate for the cost of the electrical plant, if future experiments confirm these results.

The *Financial Record* gives the following comparison of the approximate amount of gold and silver used annually in the industrial arts in the principal countries of the world:

Country.	Gold.	Silver.
Austria-Hungary	$1,960,428	$1,843,586
Belgium	684,970	396,822
France	7,872,620	4,260,540
Germany	11,969,280	5,872,600
Great Britain	6,280,150	3,564,916
Italy	1,186,270	425,640
Netherlands	296,842	628,280
Russia	5,670,000	3,875,890
Sweden	370,979	111,280
Switzerland	8,796,284	1,422,789
United States	16,784,196	7,398,984
	$63,472,019	$30,842,327

The civil service examinations which were held last week in Philadelphia to ascertain the fitness of applicants for positions under the National Government had the largest attendance ever held there, the candidates numbering over 1,200, or more than double the number that presented themselves four years ago. Of these, 1,019 were applicants for positions in the Post Office department.

One of the largest contracts ever given out by the Post Office was awarded to a Vermont paper mill last week. It calls for 11,000 tons of postal cards, or 600,000,000 in number, to be manufactured during the next four years.

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Metal and Miscellaneous Prices.

CHICAGO, AUGUST 10, 1893.

Tin—

Straits pigs.....22¢

Imported Tin Plates—

Charcoal Plates.—Bright.

Guaranteed Plates command special prices, according to quality.

		Per box.
Calland and Melyn Grade	IC, 10 x 14	@ $6.75
	IC, 12 x 12	@ 6.75
	IC, 14 x 20	@ 6.75
	IC, 20 x 28	@ 13.50
	IX, 10 x 14	@ 8.75
	IX, 12 x 12	@ 8.75
	IX, 14 x 20	@ 8.75
	IX, 20 x 28	@ 17.50
	DC, 12½ x 17	@ 6.50
	DX, 12½ x 17	@ 8.50
Allaway Grade,	IC, 10 x 14	@ 6.50
"	IC, 12 x 12	@ 6.50
"	IC, 14 x 20	@ 6.50
"	IC, 20 x 28	@ 13.00
"	IX, 14 x 20	@ 8.00
"	IX, 20 x 28	@ 16.00

Coke Plates—Bright.

	Per box.
Steel Coke—IC, 10x14.14x20.	$5.85 @$6.00
IC, 14x20.90 ℔	5.60 @ 5.75
IC, 14x20, 100 ℔	@ 5.85
10 x 20	8.75 @ 9.00
20 x 28	11.70 @12.00
X, 10x14, 14 x 20	@ 7.50
B.V. Grade. IC, 10x14, 14x20.	5.85@ 6.00

Charcoal Plates.—Terne.

Guaranteed Plates command special prices, according to quality.

Mansel and Dean Grades.—	
IC. 14 x 20	@ $5.62½
20 x 28	@ 11.25
IX. 20 x 28	@ 14.25
Worcester Brand and equal.—	
IC, 14 x 20	6.12½@
IC, 20 x 28	12.25 @
IX, 14 x 20	7.62½@
20 x 28	15.25 @

American Tin Plates.

Charcoal Plates.—Bright.

Irondale, A. A.—IC, 14 x 20	$7.00
" " IX, 14 x 20	9.00
" " IXX, 14 x 20	11.00
" " IC, 20 x 28	14.00
" " IX, 20 x 28	18.00
" " IXX, 20 x 28	22.00
Florence.—	
IC, 10 x 14, 12 x 12, 14 x 20	$6.75
IX, 10 x 14, 12 x 12, 14 x 20	8.75
Palma.—	
IC, 10 x 14, 12 x 12, 14 x 20	$7.50
IX, 10 x 14, 12 x 12, 14 x 20	9.50

Each extra cross $2.00 and 20 x 28 double these prices.

Brilliant, Tissue Packed, IC, 14 x 20	$9.25
Royal ,extra, IC, 14 x 20	7.25
Merlon, IC, 14 x 20	7.00
Almond, IC, 14 x 20	6.50
Mint, IC, 14 x 20	6.25

Coke Plates.—Bright.

Elwood.—IC, 14 x 20	$6.00
" IC, 20 x 28	12.50

Roofing Plates.

Arch (205 ℔), 20 x 28	@$11.75
Palm (205 ℔), 20 x 28	@ 12.25
Crescent, IC, 20 x 28	@ 12.50
Crescent, IX, 20 x 28	@ 15.75
Empire, IC, 20 x 28	@12 75
" IX, 20 x 28	@16.00
Hickory, IC, 20 x 28	@ 13.00
" IX, 20 x 28	@ 16.10
Alaska (heavily coated), IC, 20x28	@$14.50
Alaska IX, 20 x 28	@ 17.75
Special, IC, 20 x 28	@ 15.00
" IX, 20 x 28	@ 18.25
Merchant's Roofing (extra coated), IC, 20 x 28	@$17.75
Merchant's Roofing (extra coated), IX, 20 x 28	@$21.50
Merchant's Old Method, (extra heavily coated), IC, 20 x 28	@$19.75
Merchant's Old Method (extra heavily coated), IX, 20 x 28	$23.60
Irondale A :	
IC, 14 x 20	$6.25
IX, 14 x 20	7.75
IC, 20 x 28	12.50
IX, 20 x 28	15.50
Westmoreland :	
IC, 14 x 20	$6.25
IC, 20 x 28	12.50
Elwood :	
IC, 20 x 28	$12.00
Juno :	
IC, 14 x 20	$5.75
IC, 20 x 28	11.50
Scott's Extra Coated, Stamped and Resquared, IC, 14 x 20	$9.50
Scott's Extra Coated, Stamped and Resquared, IX, 14 x 20	11.00
Scott's Extra Coated, Stamped and Resquared, IC, 20 x 28	19.00
Scott's Extra Coated, Stamped and Resquared, IX, 20 x 28	22.00
Neville, Stamped, IC, 14 x 20	6.25
" " IX, 14 x 20	7.50
" " IC, 20 x 28	12.50
" " IX, 20 x 28	15.00
Taylor's Old Style, IC, 14 x 20 (Stamped and Resquared)	$9.50
Taylor's Old Style, IC, 20 x 28 (Stamped and Resquared)	19.00
Taylor's Roofing, IC, 14 x 20 (Stamped and Resquared)	8.25
Taylor's Roofing, IC, 20 x 28 (Stamped and Resquared)	16.50
Columbia, IC, 14 x 20 (Stamped)	7.25
" IC, 20 x 28 (Stamped)	14.50
Maple, IC, 14 x 20 (Stamped)	6.75
" IC, 20 x 28 (Stamped)	13.50
Willow, IC, 14 x 20	6.50
" IC, 20 x 28	13.00
Knoxall, IC, 14 x 20	6.25
" IC, 20 x 28	12.50
Globe, IC, 14 x 20	6.00
" IC, 20 x 28	12.00
Miami, IC, 14 x 20	6.00
" IC, 20 x 28	12.00
" IX, 20 x 28	15.00
" (Redipped), IC, 20 x 28	17.00

Tin Boiler Plates.

	Per box of 100 sheets.	Per box of 112 sheets.
X, 14 x 28	$13.00	$13.00
XX, 14 x 28	14.50	14.50
X, 14 x 31	14.50	15.80
XX, 14 x 31	16.50	17.50
X, 14 x 56	29.50	16.50
XX, 14 x 56	32.50	18.20
X, 14 x 60	31.50	17.65
XX, 14 x 60	35.50	20.90

Sheet Iron—

Black.

	Common American	Refined.
Nos. 10 to 16	℔ 2 7-10¢	3 3-10¢
17 to 20	℔ 2 8-10¢	3 4-10¢
21 to 24	℔ 2 9-10¢	3¼¢
25 and 26	℔ 3¢	3 6-10¢
27	℔ 3 1-10¢	3 7-10¢

Russia, Planished, &c.

Genuine Russia, all numbers....13¢ net.
Patent Planished....℔ A, 10¼¢; B, 9½¢ dis. 5%

Galvanized.

Juniata or first quality.....dis. 70&5%

Copper—

Ingot.

Lake.....11¾¢ @ 12¼¢
Casting Brands.....11¢ @ 11½¢

Sheet and Bolt.

Discount, 25%.

Copper Bottoms.

Discount, 25%.

Seamless Brass and Copper Tubes.

Base price, 17½¢, Chicago, with extras according to size.

Copper, Bronze and Gilding Tube, 3¢ ℔ additional.

Brazed Brass Tubing.
(To No. 20 inclusive.)

Add freight from New York to Chicago to these prices, or 50¢ ℔ 100 ℔.

Above 5-16 inch to 3 inch inclu...	35¢
Plain, above 3 inch	45¢
Plain, 5-16 inch	45¢
Plain, ¼ inch	60¢
Plain, 3-16 inch	$1.00
Plain, ⅛ inch	$1.50
Fancy Tubing, Brass, to No. 20 incl.	43¢ ℔
Bronze Tubing, 3¢ ℔ more than Brass	

35 @ 40 %

Roll and Sheet Brass.

Discount, 35 @ 40%.

Slab Spelter—

Western Spelter.....5

Sheet Zinc—

600 ℔ casks.....6¼¢
Less than Casks, ℔.....6½¢

Lead—

Soft Pig Lead.....4¼¢
Bar.....4.60¢@5¢
Pipe.....5½¢, dis. 10¢
Block Tin Pipe.....35¢
Sheet.....6¢, dis. 10%

Solder—

½&½.....13¼¢@13¾¢
Extra Wiping.....12¢

The prices of the many other qualities of Solder in the market indicated by private brands vary according to composition.

Antimony—

Cookson.....12½¢@13½¢
Hallett's.....11½¢@12½¢

Wrought-Iron Pipe—

List on following page.

1¼ and under, Plain	57½&10%
1¼ and under, Galv	52½&10%
1½ and over, Plain	67½&10%
1½ and over, Galv	60&10%
Boiler Tubes, list Oct. 24, 1892	65@67½%
Casing, list Nov. 16, 1892	52½%
Inserted Joints Casing, list Nov. 16, 1892	47½%
Steel Boiler Tubes	27½%
Cold Drawn Seamless Steel Tubing	60%

Cast-Iron Soil Pipe—

Cast-Iron Soil-Pipe, Tarred; sizes 2 to 6 inches, inclusive.....dis 70&2½%
Other sizes.....dis 60%

Leader Pipes—

Abendroth's Galv. Spiral Riveted	60%
Austin's Corrugated	60%
Gordon & Gilbert's Corrugated	60%
Ritchie's (Galv. Iron only) Cor'd	60%
Ritchie's Spiral Lock Seam, Galv'd	55%
Austin's Spiral Ribbed Pipe	60%
Plain Adjustable Elbows	60%
James A. Miller Bros. (Galv'd Iron only) Corrugated	60%

Furnace Fittings—

Discount from Excelsior Steel Furnace Co.'s list.....50%

Steel Roofing—

Perfection	$3.75 square
Climax	$3.50 square
The Lloyd Spanish Tiling	$4.50 square

Metallic Shingles—

Cushman's	$1.25 square
Merchant & Co.'s Spanish Tiles :	
Copper, 14 oz	$36.00 square
Steel, painted	$9.00 square

Drain Pipe—

Discount from list.....50%

Paints, Oils, &c.—

Deodorized Benzine	7½@8 ¢
Iron Paint, Bright Red	℔ ℔, 2 ¢
" " Brown	℔ ℔, 1¾¢
" " Purple	℔ ℔, 2½¢
" Ground in oil. B. Red	℔ ℔, 6½¢
" Ground in oil, Red	℔ ℔, 6½¢
" Ground in oil, Brown	℔ ℔, 5½¢
" Ground in oil, Purple	℔ ℔, 6 ¢
Linseed Oil, Boiled, in bbls	53¢
Linseed Oil, Raw, in bbls	50¢
Mineral Paints	2@4¢
Orange Mineral	10¾¢
Pure White Lead in Oil	6¾@7¼¢
Dry White Lead in bbls	6½@6¾¢
Red Lead, American	7@7½¢
Red Venetian, English, dry	$1.65@$1.70
Red Venetian in oil; asst'd cans, 8½¢ ; kegs	7½¢
Sipe's Japan Oil, in bbls, ℔ gal	34¢
Spirits Turpentine, in bbls., ℔ gal	32½¢
Asphaltum, Trinidad Refined, ℔ ton	$45
Tarred Felt, 1 Ply, ℔ 100 ℔	$1.65
Tarred Felt, 2 Ply, ℔ roll 108 sq. feet	$1.50
Tarred Felt, 3 Ply, ℔ roll of 108 sq. feet	$2.00
Roofing Pitch, ℔ bbl. of 300 ℔	$3.20

NEW YORK, AUGUST 11, 1893.

Aluminum—

No. 2 Grade Metal, in ton lots..℔ ℔, $0.75
No 1 (guaranteed to be 98 % pure and over), in ton lots .....℔ ℔ .90
Lots less than 1 ton, 10¢ ℔ ℔ additional.

Antimony—

Cookson .....℔ ℔, 11¢
Hallett's.....℔ ℔, 10½¢

Brass—

Planished.....net
Roll and Sheet.....35@40%

Brass and Copper Tubes

Brazed Brass Tubing—

List May 20, 1889.

	Per ℔.
Plain, to No. 20 inclusive, above 5-16 inch to 3 inch inclusive	$0.35
Plain, to No. 20, above 3 inch	45
Plain, 5-16 inch to No. 20	45
Plain, ¼ inch	60
Plain, 3-16 inch	1.00
Plain, ⅛ inch	1.50
Fancy Tubing to No. 20, inclu...	43

35@40%

Copper and Bronze Tubing—

3¢ ℔ ℔ more than brass.

Bronze, Tobin—

Drawn Rods for Bolts, Forgings, &c

Over ¼ to 3⅛ inches inclusive....17¢ ℔ ℔
Over 3⅛ to 5 inches inclusive.....18¢ ℔ ℔

Piston Rods, Finished True, Smooth and Straight.

Over ¼ to 3⅛ inches inclusive....18¢ ℔ ℔
Over 3⅛ to 5 inches inclusive.....19¢ ℔ ℔

Clips—

Buffalo Damper: Nos. 1, $1.25; 2, $2.50 per doz.....40&10%

Conductors—

Corrugated. *Round or Square—*

Galvanized.....60%
Galvanized, Locked Joints.....60%
Tin.....60%

Spiral Riveted—

Galvanized.....50%

See also *Elbows and Shoes; Eave-Trough Miters; Strainers, Conductor.*

Conductor Strainers—See *Strainers, Conductor.*

Copper—

Bottoms, Pits and Flats....25&25&5%

Ingot.

Lake.....11¢
Ansonia Grade Arizona.....10½¢
Ansonia Grade Casting.....10¢
Planished.....net
Sheet and Bolt.....25&25&5%

Tubes—See *Seamless Brass Tubes.*

Coppers, Soldering—

See *Irons, Soldering*, in Current Hardware Prices.

Damper Clips Buffalo—

See Clips, Buffalo Damper.

Eave Troughs—

Lap or Slip Joint, Galvanized.....60&5%
Lap or Slip Joint, Terne.....60%

Eave-Trough Mitres—

Lap or Slip Joint.....list, net

Elbows—

Plain Adjustable—

Tin.....70%
Galvanized.....70%

Crimped Tubing—

Re-Tinned or Galvanized.....35%

Stove-Pipe—

Buffalo Four-Piece.

4½	5	5½	6	7 inch,
$0.78	.87	.90	.99	1.20 per doz. .20 %

Elbows and Shoes—

Flat Crimp.

Tin.....35%
Galvanized.....35%

Corrugated.

Flat Crimp.

Galvanized.....60%

Round or Square.

Tin.....60%
Galvanized.....60%

Iron, Sheet—

Black.

	Common American.	R. G. Cleaned American.
Nos. 10 to 16	℔ ℔, 2½@	3.10¢
Nos. 17 to 20	℔ ℔, 2.85@	3.10¢
Nos. 21 to 24	℔ ℔, 2.94@	3.20¢
Nos. 25 and 26	℔ ℔, 3.05@	3.30¢
No. 27	℔ ℔, 3.15@	3.40¢
No. 28	℔ ℔, 3¼@	3½¢
American B. B.	℔ ℔,	4¢@4½¢

Russia, Planished, &c.

Genuine Russia, according to assortment.....℔ ℔, 11¾@12½¢
Patent Planished....℔ ℔, A, 10¢; B, 9¢, 5%
Craig Polished Sheet.....℔ ℔, 8½¢

Galvanized.

	B. B.	R.
Nos. 10 to 16		
Nos. 17 to 22		
Nos. 23 to 24		
Nos. 25 to 26		
No. 27		
No. 28		
Nos. 29 and 30		

70&5%

Filter Joints—

Lee's.....33⅓ %

Lead—

American Pig.....4¢
Bar.....4¼¢

New York Prices.

Pipe.....6¼¢, 20%
Tin Lined Pipe.....15¢, 20%
Block Tin Pipe.....37½¢, 20%
Sheet.....7¢, 20%
Old Lead in exchange, 3¼¢ ℔ ℔.

Pittsburgh Prices.

Lead Pipe in whole coils, ℔ ℔, .05¢, 10&5%
Sheet Lead in whole coils, ℔ ℔, .05½¢, 10&5%

Metal, Expanded—

Manufacturers' list No. 5.

Lathing	10%
Fencing, Painted Sheets	20%
Netting, Painted Sheets	20%
Door Mats, Galvanized	25%
Window Guards, Paneled	15%
Tree Guards, Paneled	15%

Mitres Eave-Trough—See *Eave-Trough Mitres.*

Paints Oils &c.—

Lead, Amn. White, Dry or in oil :	
Kegs, lots less than 500 ℔	7 @7¼¢
Kegs, lots 500 ℔ to 5 tons	6¾ @ 6¾
Kegs, lots 5 tons to 12 tons	6¾ @ 6¾
Kegs, lots 12 tons and over	6¼ @ 6¼
Lead, White, in oil, 25 ℔ tin pails, add to keg price	@ ¾

Lead, White, in oil, 12½ ℔ tin pails, add to keg price..... ...@ 1
Lead, Red, bbls. and ½ bbls... 6 @ 7
Lead, Red, kegs . . . . . 6¼ @ 7¼
Ocher, American ..... ½ @ 1¼
Red, Venetian, American .....
℔ 100 ℔..1.00 @ 1.10
Linseed Oil:
City, raw, ℔ gal..... ..@ .50
City, boiled..... ..@ .53
Western, raw..... ..@ .50
Spirits Turpentine:
In regular bbls.....28½ @ . 29
In machine bbls ..... 29 @ .29½
Putty:
In barrels and ½ bbls..... .01¾ @ .01⅞
In tubs ..... .01⅝ @ .01⅞
In tin cans ..... .01⅝ @ .02⅛
In bladders ..... .01⅞ @ .02¼
Roofing Material, &c.:
Asphaltum, Trinidad Refined, ℔ ton. ....$30.00@$35.00
Asphaltum, Rock, ℔ ton.....$14.00
Coal Tar Felt, 1 Ply, ℔ ℔.....2¢
Coal Tar Felt, 2 Ply, ℔ roll 108 sq. ft. $1.42½
Coal Tar Felt, 3 Ply, ℔ roll 108 sq. ft. $1.8r
Roofing Pitch, ℔ bbl.....$2.24

Pipe, Drain 50%

Pipe and Fittings, Cast Iron Soil—

Cast-Iron Soil Pipe, Tarred, sizes 2 to 6 Inches, inclusive.....60@60&10%
Other sizes.....55@55&10%
Cast-Iron Fittings, Tarred, sizes 2 to 6 inches ... .60@60&10%
Other sizes.....55@55&10%

Pipe, Spiral—

Galvanized.....60%
Tin.....60%

Rock and Slag Wool—

	℔	℔ cub. foot.
Slag Wool, ordinary....	1¼	19¢
Slag Wool, extra.	4½	38½¢
Rock Wool, ordinary...	2¼	27¢
Rock Wool, extra.....	7¼	43½¢

Rosin—

Common and Good—Strained.
Rosin, C. & D.....℔ bbl. $1.05@$1.10
Rosin, E. & F.....℔ bbl. $1.20@$1.40
Rosin, G. & H.....℔ bbl. $1.50@$1.75
Rosin, I. & K.....℔ bbl. $1.95@$2.50
Rosin, M. & N.....℔ bbl $2.75@$3.50

Seamless Brass Tubes..net

Shoes and Elbows—See *Elbows and Shoes.*

Slate Roofing—

According to size, f.o.b. cars, Quarry Station.

Pennsylvania:
Best Bangor, ℔ sqr.....$3.25@$4.50
Pen Argyle, ℔ sqr..... 3.50@ 4.25
Peach Bottom, ℔ sqr..... 5.00@ 6.25
No. 1 Chapman, ℔ sqr..... 4.00@ 4.65
Lehigh Slates, ℔ sqr..... 3.00@ 4.50
Vermont:
Sea Green, ℔ sqr..... 2.70@ 3.20
Purple, ℔ sqr..... 3.50@ 4.50
Unfading Green, ℔ sqr..... 3.50@ 4.00
Red, ℔ sqr..... 9.75@12.00

Solder and Soldering Fluids—

Solder—

½ & ½ (Guaranteed)..... 13½@14½¢
No. 1..... 11¾@12 ¢
Prices of Solder indicated by private brands vary according to composition.

Soldering Fluids—

Concentrated Soldering Flux.
f.o.b. New York.
In barrels, ℔ ℔.....4¢
Smaller quantities, ℔ ℔.....5¢

Gedney's Soldering Fluid.
In carboys or barrels, ℔ ℔.....2¢
$1.50 for carboy or barrel; money refunded when returned.

Perfection Soldering Flux.
No charge for package.
3bls., about 500 ℔, ℔ ℔.....3½¢
½ bbls., about 300 ℔, ℔ ℔.....4¢
Kegs, about 110 ℔, ℔ ℔.....4¢
75¢ extra for keg. 5% dis.
Kegs, about 55 ℔, ℔ ℔.....4¢

Yager's Soldering Salts.
¼-℔ bottles, each.....30¢
Large quantities, per ℔.....40¢

Spelter—

Western Spelter..... .....4¾¢@5¢
Bertha ....8¢

Spiral Pipe—See *Pipe, Spiral.*

Stove-Pipe Elbows—*See Elbows. Stove Pipe.*

Stove Polish—See *Polish, Stove.*

Stove Trucks—See *Trucks, Stove.*

Strainers Conductor—

Galvanized.....60%

Tin, Pigs and Bars—

Banca, pigs, ℔ ℔ ... .21½¢
Straits, pigs, ℔ ℔.....21¢
Straits in bars, ℔ ℔.....22¢

Tin Plates—

American Terne Plates—

Apollo Roofing.

IC, 14 x 20.....$6.25
IC, 20 x 28.....12.50
IX, 14 x 20.....7.25
IX, 20 x 28.....14.50

Buckeye.

IC, 14 x 20.....$7.00
IC, 20 x 28.....14.00
IX, 14 x 20.....8.25
IX, 20 x 28.....16.50
IXX, 14 x 20.....9.50
IXX, 20 x 28.....19.00

Continental Tin Plate Works.

	14 x 20	20 x 28
IC Terne, Pennsyl Old Method, Treble Coated.	$8.50	$16.75
IC Terne, Leominster, Extra coated.....	7.75	15.00
IC Terne, Waldo, Redipped	7.25	14.00
IC Terne, Alderly, Extra quality.....	6.37½	12.50
IC Terne, Phoenix.....	5.80	11.50
IC " Climax.....	5.70	11.25
IC " Venux.....	5.60	11.00
IC " Flag	5.50	10.50

De Mill's.

First New York, IC, 14 x 20.....$5.75
" " " IC, 20 x 28 ..... .11.50
First New Jersey, IC, 14 x 20..... 5.75
" " " IC, 20 x 28.....11.50
Manhattan, IC, 14 x 20 ..... 7.00
" IC, 20 x 28 ....14.50

Dunlap's.

Double Dipped, IC, 14 x 20.....$8.25
" " IC, 20 x 28 .....16.50
" " IX, 14 x 20..... 9.50
" " IX, 20 x 28.....19.00
Domestic, IC, 20 x 28..... .....12.00
" IX, 20 x 28.....15.00

Glendale Tin Plate Co.

Optimus, Best Redipped, IC, 14 x 20.$8.25
" " " IC, 20 x 28.16.50
" " " IX, 14 x 20. 9.75
" " " IX, 20 x 28.19.50
N. F., Old Style, IC, 14 x 20..... 7.50
" " " IC, 20 x 28 .... 15.00
" " " IX, 14 x 20..... 9.00
" " " IX, 20 x 28..... 18.00
Bonus, Extra Coated, IC, 14 x 20... 6.75
" " " IX, 14 x 20... 8.25
" " " IC, 20 x 28...13.50
" " " IX, 20 x 28...16.50

Hamilton's.

Hamilton's Best Redip'd, IC, 14x20 $9.25
" " " IC, 20x28 18.50
" " " IX, 14x20 10.75
" " " IX. 20x28 21.50
Osceola Hand Coated, IC, 14x20 8.25
" " " IC, 20x28 16.50
" " " IX, 14x20 9.75
" " " IX, 20x28 19.50
Lula Best Charcoal, IC, 20x28 12.50
" " " IX, 20x28 16.00

Laufman's.

Apollo, IC (Resquared), 14 x 20.....$8.12
Apollo, IX (Resquared), 14 x 20..... 9.37
Apollo, IC (Resquared), 20 x 28.....16.00
Apollo, IX (Resquared), 20 x 28.....18.50
Apollo, IC (Resquared), 20 x 56.....16.00
Apollo, IX (Resquared), 20 x 56.....18.50
Tip Top, IC (Resquared), 14 x 20.... 6.62
Tip Top, IX (Resquared), 14 x 20.... 7.88
Tip Top, IC (Resquared), 20 x 28....13.00
Tip Top, IX (Resquared), 20 x 28....15.50
Allegheny, IC, 14 x 20..... 6.12
Allegheny, IX, 14 x 20..... 6.38
Allegheny, IC, 20 x 28.....12.00
Allegheny, IX, 20 x 28 .....12.50

McKinley Tin Plate Co.

McKinley:
IC, 20 x 28 ... . $12.00
IX, 20 x 28 . . . . . 15.00
Fort Pitt.
IC, 20 x 28 . . . . . $11 00
Chicago:
IC, 20 x 28 .....11.50
Wilkinsburg Redipped:
IC, 20 x 28.....$16.00
IX, 20 x 28.....19.00

Merchant's.—All Stamped

Crescent, IC, 20 x 28.....$12.00
Crescent, IC, 14 x 20..... 6.00
Hickory, IC, 20 x 28 (Resquared).. 12.75
Hickory, IC, 14 x 20 (Resquared)...6.37½
Empire, IC, 20 x 28..... 12.25
Empire, IC, 14 x 20.....6.12½
Alaska, IC, 20 x 28 (Resquared).... 14.00
Alaska, IC, 14 x 20 (Resquared).... 7.00
Merchant's Roofing, IC, 20 x 28 (Resquared)..... 17.00
Merchant's Roofing, IC, 14 x 20 (Resquared)..... 8.50
Merchant's Old Method, IC, 20 x 28 Resquared)..... 19.00
Merchant's Old Method, IC, 14 x 20 (Resquared) 9.50

Pittsburgh Tin-Plate Works.

Kensington:
IC, 14 x 20 ..... $6.75
IC, 20 x 28..... 13.50
IX, 14 x 20..... 8.00
IX, 20 x 28 ..... 16.00
Westmoreland:
IC, 14 x 20 ..... $6.25
IC, 20 x 28..... 12.50
Juno:
IC, 14 x 20..... $5.75
IC, 20 x 28 ..... 11.50

Scott's.—All Stamped.

Scott's Extra Coated, IC, 14 x 20 (Resquared) $9.25
Scott's Extra Coated, IX, 14 x 20 (Resquared)..... 10.75
Scott's Extra Coated, IC, 20 x 28 (Resquared)..... 18.50
Scott's Extra Coated, IX, 20 x 28 (Resquared)..... 21.50
Neville, IC, 14 x 20 ..... 6.00
" IX, 14 x 20..... 7.25
" IC, 20 x 28..... 12.00
" IX, 20 x 28 .....14.00

N. & G. Taylor Co.'s.

Taylor, Old Style, IC, 14 x 20 (Stamped and Resquared)..... $9.25
Taylor Old Style, IC, 20 x 28 (Stamped and Resquared)..... 18.50
Taylor Roofing, IC, 14 x 20 (Stamped and Resquared)..... 8.00
Taylor Roofing, IC, 20 x 28 (Stamped and Resquared)..... 16.00
Columbia, IC, 14 x 20 (Stamped)... 7.00
Columbia, IC, 20 x 28 (Stamped)... 14.00
Maple, IC, 14 x 20 (Stamped)..... 6.50
Maple, IC, 20 x 28 (Stamped)..... 13.00
Willow, IC, 14 x 20..... 6.25
Willow, IC, 20 x 28..... 12.50
Knoxall, IC, 14 x 20 .. .. 6.00
" IC, 20 x 28..... 12.00
Globe, IC, 14 x 20..... 5.75
Globe, IC, 20 x 28..... 11.50

A. A. Thompson & Co.'s.

Old Colony, IC, 14 x 20.....$8.00
" " IC, 20 x 28..... .....16.00
Thompson's Puritan, IC, 14 x 20.....5.75
" " IC, 20 x 28....11.50
Durham, IC, 14 x 20.....5.75
" IC, 20 x 28.....11.50
Central, IC, 14 x 20..... 5.45
" IC, 20 x 28.....10.75
" WC, 14 x 20..... 5.25
" WC, 20 x 28.....10.25
Tarn, IC, 20 x 28.....10.50

U. S. Brands.—All Stamped.

U. S. Monongahela, IC, 14 x 20.....$6.50
U. S. Redipped, IC, 14 x 20..... 9.25
20 x 28 double the price of 14 x 20

American Bright Plates—

Continental Tin Plate Works.

	"Phoenix" extra.	Climax
IC, 14 x 20, Bright..	$6.50	$6.25
IX, " " ...8.00		7.75

All sizes and thicknesses, etc.

Merchant's.

Merchant's Dipped, IC, 14x20.....$11.00
Palma Xtra, IC, 14x20..... .....7.25
Florence, IC, 14x20.....6.75

N. & G. Taylor Co.'s.

Brilliant, Tissue Packed, IC, 14x20..$9.00
Royal, extra, IC, 14x20.....7.00
Merion, IC, 14x20.....6.75
Linden, IC, 14x20..... .....6.50
Almond, IC, 14x20.....6.25
Mint, IC, 14x20.....6.00

U. S.

IC, 14x20..... .....$7.25
IC, 20x28..... .....14.50

Imported Terne Plates—

Charcoal.

Dean Grade.—IC, 14 x 20.....@$5.50
20 x 28.....@11.00
IX, 14 x 20.....@ 6.75
20 x 28.....@13.50
Abercarne Grade.—IC, 14 x 20.....@ 5.40
20 x 28.....@10.80
IX, 14 x 20...@ 6.62½
20 x 28.....@13.25

Imported Bright Plates—

Charcoal.
Duty: 2.2¢ ℔ ℔.

Melyn and Calland Grade. IC, 10 x 14.....@$6.50
" " IC, 12 x 12.....@ 6.75
" " IC, 14 x 20.....@ 6.50
" " IC, 20 x 28.....@13.00
" " IX, 10 x 14.....@ 8.50
" " IX, 12 x 12.....@ 8.75
" " IX, 14 x 20.....@ 8.50
" " IX, 20 x 28.....@17.00
" " DC, 12½ x 17.....@ 6.00
" " DX, 12½ x 17.....@ 8.00
Allaway Grade. IC, 10 x 14.....@ 6.00
" " IC, 12 x 12.....@ 6.25
" " IC, 14 x 20.....@ 6.00
" " IC, 20 x 28.....@12.00
" " IX, 10 x 14.....@ 7.50
" " IX, 12 x 12.....@ 7.75
" " IX, 14 x 20.....@ 7.50
" " IX, 20 x 28.....@15.00
" " DC, 12½ x 17.....@ 5.50
" " DX, 12½ x 17.....@ 7.00

Coke.

Steel Coke.—IC, 10x14, 14x20.$5.40@$5.50
10x20.....@ 8.50
20x28.11.50@12.00
IX, 10x14, 14x20.....@ 6.75
B. V. Grade.—IC, 10x14, 14x20....@ 5.50

Imported Boiler Plates.—

IXX, 14x26..(112 sheets)..... ..@$13.35
IXX, 14x28..(112 sheets)..... ..@ 14.50
IXX, 14x31..(112 sheets)..... ..@ 16.00

Tinning—

Brass and Copper.....net

Tubing—

Tin.....55%
Galvanized.....55%

Troughs, Eave—See *Eave Troughs*

Trucks Stove—

Improved Lock Frame, per doz....$15.00
Steel Lock Frame, per doz..... 13.00

Brass and Copper.—

Standard List.....30@33⅓%

Zinc—

600 ℔ casks.....6¼¢
Per ℔.....7¢

News and Notes.

In the United States Circuit Court a Pittsburgh last week a bill was filed by P. H. and F. M. Roots of Connersville, Ind., against the Pennsylvania Coal Company and Dunmore Iron & Steel Company of Lackawanna County, Pa. The bill asks for an injunction restraining the defendants from making, using or selling an apparatus for removing slack coal upon which the plaintiffs claim a patent.

The American Wire Glass Mfg. Company, Tacony, Philadelphia, have had their large new factory run ning for nearly a month, and are now putting out some 3000 square feet of wire glass a day. The full capacity of the works will be 5000 square feet a day, which output will shortly be reached. Orders and inquiries for this new material are said to have reached the company from all parts of the world and they have received numerous expressions of approval from customers to whom they have already delivered consignments of wire glass.

One of the biggest street railway negotiations ever made was consummated in New Jersey a few days ago. The New Jersey Traction Company have absorbed or leased the traction lines in almost all the cities of the State, so that the syndicate now enjoys a practical monopoly of the street railway interests throughout New Jersey.

Heavy rains in the British Isles have somewhat relieved the gloom which has enveloped the agricultural industries, and better prospects for the wheat crop are reported, although the harvest will be a bad one in most parts of England. The *Times* says, however, that the condition of agriculture in Great Britain is about as bad as it can be, and prices for cereals, sheep and cattle are lower than they have been for years.

The "Black Country" in England bids fair to make its popular name inapt within a short time. A London journal noted lately the great change which is coming over that district in the growing use of gas and oil engines for motive power in place of the coal-fed furnaces and steam engines which have hitherto contributed to maintain a heavy pall of smoke over the country. This is now in a fair way to be obviated, and a complete transformation of the face of the landscape will in time be presented to travelers, who have always dreaded the railway journey through the "Black Country."

A new feature developed by the present money stringency is the collection by New York banks of drafts on banks in other cities and towns through the medium of the express companies. The cost of this transaction is materially below the rate charged for interior exchange.

On August 1 the new cruiser "New York" went into commission at Cramp's shipyard, and the 8-inch guns were hoisted on board. The barbettes and turrets will require another month to complete.

The New York *World*, in what it claims to be an authentic list compiled from official sources, places the present number of trades-union men now unemployed in this city at 36,177, or 27.6 of the whole.

LABOR EXCHANGE.

Notices under this heading of reasonable length are inserted free of charge. Only those relating to employment are admitted. Write distinctly on one side of paper only, and do not use postal cards.

HELP WANTED.

A reliable, temperate TINSMITH who understands general jobbing, roofing, assortment work, and has some knowledge of plumbing and iron-pipe work; married man preferred; experience and reference must be given; steady work if competent. A. T. Skillman, Hightstown, N. J. Aug. 12

At once, a TIN ROOFER; one with some knowledge of shop work; young man preferred; one not afraid to work. "J. C. S. L." Box 262, Raleigh, N. C. Aug. 12

FOREMAN for foundry; a practical man on stove repair work and water backs; must understand handling of men, be sober, steady and honest; steady work to handy man, reference required; state salary expected. "J. M. W.," office of *The Metal Worker*, 96-102 Reade street, New York City. Aug. 12

At once, a first-class TINSMITH and PLUMBER, who is steady and industrious, having a good experience in each kind of work; steady employment to the right man; state wages. C. Taylor & Co., Sidney, N. Y. Aug. 12

STOVE SALESMEN for the States of Illinois and Iowa to sell a line of new and modern stoves on commission, which has been introduced in this territory; quality strictly first class and prices moderate; only those acquainted with the trade need answer. "Commission," office of *The Metal Worker*, 96-102 Reade street, New York City. Aug 12

A good PLUMBER, who understands hot-water heating; must be strictly temperate. S. Woodhead, 108 Main street, North Adams, Mass. Aug 12

A partner wanted, that is a good, first-class TINSMITH and has some capital to invest in the hardware, tin and stove business. C. H. Goodfellow, Clinton, N. Y. Aug. 5

At once, a TINSMITH and GENERAL JOBBER; state age, experience and wages; a steady job to the right man. A. H. Lyman, Athol, Mass. Aug. 5

At once, a first-class TINSMITH; one used to stove, range and furnace work, general jobbing and tin roofing; steady work to a reliable and temperate man. F. S. Thompson, 43 North Front street, Kingston, N. Y. Aug. 5

A first-class straight PLUMBER for all the year round; $3 a day is the limit to a man who is quick, able and steady; must understand pumps; married man preferred; at once. Wm. H. Worrell, Lansdowne, Pa. Aug. 5

A PLUMBER and TINNER by September 1; one who understands lead and iron piping, tin roofing, pump and bench work, with some knowledge of the hardware business; steady job and good pay to the right man; give full particulars as to ability, habits, age and wages desired. O. H. Tebay, Leechburg, Pa. Aug. 5

At once a good PLUMBER, STEAM and HOT WATER FITTER; state wages expected. W. C. Danser, Weston, W. Va. Aug. 5

SITUATIONS WANTED

Two first-class JOURNEYMEN PLUMBERS would like to work in the South. "H. M.," office of *The Metal Worker*, 96-102 Reade street, New York. Aug. 12

By a practical STEAM and HOT-WATER FITTER, 24 years old and strictly sober and reliable, a steady situation, city or country. "A. L.," P. O. box 247, Webster, Mass. Aug. 12

A situation by a young man, 26, as BOOKKEEPER or TRAVELING SALESMAN; have had four years' experience as bookkeeper and one year as traveling salesman; have had experience in wholesale and retail hardware as clerk, bookkeeper and traveling salesman; best of references. B. D. Higgins, Sidney, Ohio. Aug. 12

A practical CORNICE MAKER, CUTTER and DRAFTSMAN; thoroughly understands the business in all branches; can do all kinds of hammer and raised work by hand and machine; has had experience as foreman; can handle help to best advantage; moderate salary. "Practical," office of *The Metal Worker*, 96-102 Reade street, New York City. Aug 12

As MANAGER or SUPERINTENDENT of stove works; over 20 years' experience; understands the business in all its details from the office down. "S.," Box 812, office of *The Metal Worker*, 96-102 Reade street, New York City. Aug. 12

By a TINSMITH of 12 years' experience, with a good knowledge of plumbing and hot-water and steam fitting; 28 years of age; married; can furnish good reference; city preferred. A. J. Bouchey, 445 Second street, Troy, N. Y. Aug. 12

CORNICE CUTTER desires situation in cornice shop; 20 years' experience. "L. W.," office of *The Metal Worker*, 59 Dearborn street, Chicago, Ill. Aug. 12

By competent man, CORNICE MAKER, CUTTER or FOREMAN; good reference. "R. S. T.," office of *The Metal Worker*, 59 Dearborn street, Chicago. Aug. 12

STOVE MOUNTER wishes a position as inspector, foreman or at the bench or contract, East or West; positively first-class in all branches; late with the Michigan Stove Company; age 31 years. "Modern," office of *The Metal Worker*, 96-102 Reade street, New York City. Aug. 12

HARDWARE CLERK, 24 years old; having disposed of my wholesale and retail hardware business I would like to engage with some firm as manager or clerk. "Hardware Clerk," office of *The Metal Worker*, 96-102 Reade street, New York City. Aug 12

A first-class PLUMBER and GAS FITTER, having city and county experience, would like a steady situation with reliable firm; best of references given. Fred. Bowers, Lock Box 40, Lykens, Dauphin County, Pa. Aug 12

A position by a young man in a hardware, stove and tin shop; four years' experience; best of references. E. L. Carr, 39-41 Main street, Clifton Springs, N. Y. Aug 12

As FOREMAN, by a first-class all-around stove mounter; best and quickest methods. "Western Driller," office of *The Metal Worker*, 96-102 Reade street, New York City. Aug. 12

By a TINSMITH and CORNICE MAKER, who can cut patterns and do hammering work. Charley J. Sander, Bowling Green, Ky. Aug. 12

As TRAVELING SALESMAN, by a practical job tinner of 20 years' experience, with some good jobbing, tin-plate or hardware house, or position as job tinner, or salesman in a hardware store; 43 years of age and temperate; Western New York territory preferred; at liberty now. J. E. Whitbeck, Phelps, N. Y. Aug. 12

One or two good reliable and industrious PLUMBERS would like a job in any part of the country. "Plumber," office of *The Metal Worker*, 96-102 Reade street, New York City. Aug. 12

As TINNER and SKYLIGHT and CORNICE MAKER; can work from drawings and hammering work. John Kylian, 1376 Avenue A, New York City. Aug. 12

By a young man 19 years of age with some good firm to learn plumbing and steam fitting; good habits and steady; can furnish first-class references. Samuel J. Christian, Box 125, Philmont, N. Y. Aug. 12

By a reliable German, 34 years of age, as CORNICE MAKER; good at plans, figures and cutting; New York or vicinity. "A. B.," Box 812, office of *The Metal Worker*, 96-102 Reade street, New York City. Aug. 12

A good TINSMITH, 19 years old, single; five years' experience; city or country. Philip Schapiro, care of Sonenschein, 128 Moore street, Brooklyn, N. Y. Aug. 12

A good TINSMITH, 20 years old, single; six years' experience; city or country. Ch. Friedmann, 154 Varet street, Brooklyn, N. Y. Aug. 12

By a young married man, 31 years old, speaks English and German, a steady job the year round as FOREMAN in tin shop and clerk in hardware store; am a first-class tinner and salesman, have had 18 years' experience as both; state wages when writing; can give gilt edge reference as to honesty, sobriety and capability. H. W. Kuehner, P. O. Box 24, Boonville, Mo. Aug 12

By a TINNER with years of experience in city and country shops and country hardware stores, by September 1; best of references; married. Box 195, Onawa, Monona County, Iowa. Aug 12

By a TIN and SHEET-IRON WORKER at inside and outside work; also general jobbing and roofing. B. Simon, 203 Eldridge street, New York. Aug. 12

As HEATING ENGINEER and SALESMAN in or near Boston; accustomed to handle correspondence and financial affairs. "Engineer," office of *The Metal Worker*, 96-102 Reade street, New York. August 5

TINSMITH, accustomed to do all kinds of work, inside and outside, and general jobbing, wants a steady position. John Petrie, 402 E. 121st street, New York City. August 5

Steady job by a TINNER, with three years' experience working on common tinware and at roofing and spouting, good habits and best of reference. "Jack the Tinner," box 101, Walkerton, Ind. August 5

A young man with two years' experience in a machine shop wants position to finish the trade. H. Zipser, 186 Suffolk street, New York City. Aug. 5

Strong young jobbing PLUMBER desires a place; four years' experience; can do roofing, gas-fitting and stove work; wages no object; has references; city or country. Joseph Manning, 232 West Sixty-fourth street, New York City. Aug 5

By an experienced TINSMITH. Herman Landesbarg, 292 Delancy street, New York. Aug. 5

By a first-class PLUMBER; in city or country. T. Walsh, 324 East Fortieth street, New York. Aug. 5

By practical PATTERN MAKER, with a good firm; can give good references. C. H. Lewis, 211 Genesee street, Utica, N. Y. Aug. 5

Position as FOREMAN in tinware factory; thoroughly understands all dies and manufactured, pieced, pressed and stamped ware; first-class reference as to character, capabilities, &c. "L.," Box 805, office of *The Metal Worker*, 96-102 Reade street, New York City. Aug. 5

As TINNER and SALESMAN in a hardware store; five years' experience in a tin shop and two years' in a hardware store; steady position with some good firm desired; am strictly temperate and can furnish the best of references; position desired by September 1; state wages. G. W. Burroughs, Rocheport, Mo. Aug 5

G. & J. R.

BOLTON HEATERS.

MANUFACTURED BY

The FOSKETT & BISHOP CO.,

NEW HAVEN, CONN.

114 LIBERTY ST., N. Y. CITY.

Wholesale Agents:

Illinois Malleable Iron Co., Chicago.

The Rouse & Hills Co., Cleveland, O.

Send for Catalogues and Price-List.

The trade cannot fail to be benefited by corresponding with us on Hot Water Heating.

THE METAL WORKER.

NEW YORK AND CHICAGO.

Saturday, August 19, 1893.

DAVID WILLIAMS, - PUBLISHER

BUSINESS OFFICES:

NEW YORK.....96-102 Reade Street.
PHILADELPHIA.....220 South Fourth Street.
BOSTON.....146 Franklin Street.
PITTSBURGH..... Room 509 Hamilton Building.
CHICAGO.....59 Dearborn Street, cor. Randolph.
CINCINNATI.....Rooms 22-24 Pickering Building.
ST. LOUIS.....Bank of Commerce Building.
CLEVELAND.....312 The Cuyahoga.

BRITISH AGENCY: The Ironmonger, 42 Cannon street, London, England.

Results of the Fair.

The manufacturer, reading about the increase in artistic taste which will follow the Columbian Fair, and the artistic results which will be obtained, is very likely to ask, What good will this be to me? Very much everywhere. It will mean a refurnishing and furbishing all over the country. It will mean that people everywhere will be dissatisfied with their old works and will wish for new. It will mean that things that have passed muster as handsome enough and good enough will be quietly handed over to the junkman and will be replaced by new at the first opportunity. It means the creation of a wide demand among people in comfortable circumstances in life. It will do more for the West than Philadelphia did for the East, and there will not be an architect, a hardwareman or a stove dealer who will not feel advantageous effects from the artistic side of the fair.

Electrical Plumbing.

Some time ago we called the attention of plumbers to the fact that their trade might be augmented and a very profitable line of work engaged in by the introduction of the electrical wiring of houses into their business. While this is not now a novelty in the plumbing trade, it is, notwithstanding, somewhat unusual to find plumbers in this country who have studied up the matter of electricity and its practical application sufficiently to enter into the work of wiring houses for annunciators and electric bells, &c. We believe that those enterprising master plumbers who have taken up this branch have been more than repaid for the trouble and work it has cost them, and we know that the practice is becoming more general, particularly among the younger members of the craft, who are ambitious and who are not afraid of hard labor. It will be an incentive to those progressive members of the craft to learn that some of their brethren abroad have gone ahead in this matter. It is natural that in the larger European cities where there is much electrical work done that there should be craftsmen equipped for this business, but it is somewhat of a surprise to learn from a recent issue of a local paper published in the island of Malta that the combination calling of electrician and plumber is there practiced by J. T. Paterson. In his announcement Mr. Paterson says that he has just received an extensive assortment of electrical goods and is prepared to fit up electrical appliances and keep them in order by contract for the year.

Keeping Things Square.

The shop or store with things askew bespeaks the character of the one in charge. It seems as though some men were born and bred with order in every act, while with others it is a faculty seemingly never to be acquired. In point of fact, it certainly is just as easy to place a thing squarely with relation to surrounding objects as it is to give it the appearance of having been simply dropped regardless of appearances. Nowhere does the effect of symmetrical arrangement show to better advantage than in the store. A single article misplaced or askew may have but little effect upon the general appearance, but the habit that allows an object to be thus placed will allow a hundred to offend the eye. The impression upon the customer may not be realized either by himself or the storekeeper, but nevertheless if he is a man of any orderly sensibilities he cannot help comparing store and keeper with others, and inevitably inclining toward the orderly arrangement and the man who can maintain it. It is sometimes surprising to see the effect of a few moments devoted to simply setting square a helter-skelter assortment of articles. In the shop, particularly where similar pieces are made in quantity, they can as well be laid in order as they are operated upon as thrown into an eye-offending pile upon the floor. The manager of such a shop may do much toward the education of his men in orderliness by simply compelling them to keep their work symmetrically arranged. It will not be long before general cleanliness and order will follow as a mere matter of habit.

Electricity and Drought.

The connection between telegraph wires and the recent drought in Europe and portions of the United States is not at first apparent. A correspondent of a Belgian paper, however, offers an ingenious theory by which he seeks to prove that the network of telegraph, telephone and street railway wires which now covers the two continents may have caused such a weakening and diversion of the terrestrial magnetism necessary for the due absorption of moisture by the atmosphere as to entail such a drought. He recalls the fact that as the earth is charged with positive and the atmosphere with negative electricity, we live, as Prof. Oliver Lodge has observed, between the armatures of an immense Leyden condenser. Each portion of the upper armature, which, descending in the form of a cloud, diminishes the thickness of the interposed air stratum, induces the danger of a disruptive discharge, which would be very formidable if the earth and clouds were perfect conductors. The Belgian writer accordingly advances a novel rain-making proposal, which has at least some plausible features of recommendation.

To Make Rain.

As the influence of electricity in provoking atmospheric disturbances is acknowledged, he proposes to charge the clouds by means of balloons with a sufficient quantity of high-tension electricity to "tap" their contents. He observes that 1093 yards of iron wire 0.04 inch in diameter weighs over 13 pounds and has a resistance to tensile strain of 10¾ tons per square inch, which is less for copper wire and equal to that of phosphor bronze of the same diameter, the weight of which is also nearly the same. A balloon of slight ascensional power may take up into the air one or more such wires several thousand yards long, which, connected with the earth, would constitute an immense lightning conductor, and draw electricity from the upper regions of the air. The balloon need have no occupants, the increased strain due to paying out the wire being compensated for by the automatic discharge of liquid or powdered ballast. This, the inventor believes, would be a powerful means of provoking a change of weather, and probably bringing about an abundant downpour of rain when desired. The amount of moisture in the air, strange to say, does not appear to enter into the calculations of those who would regulate the celestial watering pot.

Contracts and New Work.

We begin this week publishing items respecting contracts awarded and work under way and proposed, in a separate column, for the benefit of the heating and plumbing trades. For some time we have made a point of furnishing items of this sort, but we believe that compiling them and bringing them together in a single department of the paper will render them of not a little interest and value to many of our

readers who do work of this character. When the contract has been awarded it is a matter of only general interest as telling what firms have entered into competition and who was the successful bidder. The feature of especial value, however, that these items cover is the gossip about new work that is to be undertaken. Sometimes this information relates to alterations or new apparatus and fixtures that may not be installed for many months to come, but it gives the contractor a chance to look over the ground and familiarize himself with it before the bids are actually let. We shall be glad to receive information concerning new work of this sort, so that we may make this column of notes as full and valuable as possible.

Same as Last.

The necessity of explicit directions accompanying orders for goods, to which we referred in our issue of July 15, 1893, both as to the kind and quantity wanted, also as to how they are to be shipped, has called out a communication relating to this subject from a representative Philadelphia wholesale house. They advise us that a great many orders are received reading, so many boxes or so many pounds of material "same as last." This, they explain, involves the waste of a great amount of routine work and time, especially when many orders are received by the same mail, and there is always the possibility of an error should the house fail to unearth the very last order. It is believed customers get into the habit of writing orders in this way because they have the prior invoice before them at the time of making out the order, and do not realize the inconvenience it entails upon the house, nor the possibility of their not receiving the goods and quantities desired. With the rush of business any uncertainty as to just what is wanted adds largely to the liability of errors.

QUICK TRANSPORTATION.

The Philadelphia concern before referred to advise us that the Trades League of Philadelphia are taking up the matter of time made on shipments of goods, the form given herewith being printed on postal cards and used for this purpose :

1. Shipper's Name.....
2. Date of Shipment.....
3. Destination.....
4. Name of Railroad or Freight Line Used.
.....
5. Date of Arrival at Destination.....
6. Signature.....Consignee.

On the reverse side of the cards is the printed address of the general transportation agent of the Trades League. The first four items of these cards are filled out by the house shipping the goods, and the cards are sent by them to the consignee. The date of arrival of the goods and the signature of the firm receiving the goods are filled in by the consignee, and the cards mailed by him to the transportation agent. When the cards are received by him, his name and the date of receipt are stamped upon them, and they are returned to the house which shipped the goods. Using this system is considered a very important step, as the experience of shippers has heretofore been that when they inclosed their own postal cards to customers asking for information the retailers do not seem inclined to furnish it, probably through thoughtlessness on their part, and because they do not realize the necessity of giving the shippers all the information possible to aid in securing good railroad service. It is a common occurrence for shippers to receive requests to trace certain shipments, whereas consignees do not seem inclined to render the proper assistance in this direction when called upon to do so.

A Loud Telephone.

Many attempts have been made for some time past to construct a telephone which will really talk loud enough for a person in any part of a large room to hear and understand, but hitherto they have all failed with the exception of the "talking apparatus" recently devised by Mr. Graham of the Electric Wiring & Fittings Company, 2 Princes street, Westminster, London, and described in the London *Times*. He has succeeded not so much by an improvement on the existing telephones, although some modification of the apparatus has been effected, as by his method of arranging the circuit and bringing its resistance as low as possible. To this end the usual induction coil is discarded, and the two instruments, transmitter and receiver, are directly connected in circuit with the line and the battery. The transmitter of A at one end of the line is connected to the receiver of B at the other end. As this arrangement only permits of A speaking to B, and not of B replying to A without a change of the connection and a substitution of apparatus, two separate lines are employed having a common return wire. On the second line the transmitter of B is directly connected to the receiver of A. The two correspondents can thus talk quite freely with each other, and as the receivers speak out so as to be heard in any part of a room conversation can be carried on by each person simply speaking to his transmitter. This apparatus is attached to flexible conductors and is held in the hand. To open a conversation it is sufficient to pick up the portable transmitter and press a button in its casing so as to establish the circuit, then speak into it. The receiver at the other end acts as its own call-bell by the loudness of its voice, and the response comes equally prompt and loud. The user has, therefore, no need to listen carefully with one or two receivers held up to his head. All he has to do is speak into his transmitter and keep his ears open. The apparatus is therefore highly convenient, and allows the user freedom of action. It is chiefly intended for domestic service from one part to another of a house, office or workshop, and it will be especially useful on board ship, particularly in men-of-war, or in building yards, farms, newspaper offices and other large establishments.

This year's British wheat crop is estimated at 7,000,000 quarters, which leaves about 21,000,000 quarters to be imported. Reducing the stock left over from 1892, there will be needed 19,000,000 quarters. The *Mark Lane Express* of London, in its weekly review of the British grain trade, said a few days ago in respect of this circumstance: "It is not easy to see where this supply is to come from. It will absorb all the good crops of Russia, India and Southeastern Europe to fill the British requirements." Where do the United States and Canada come in? Wheat is said to be grown in both countries.

A New Chicago Cable Line.

The cable was started recently on Blue Island avenue, Chicago. The arrangement of the new Blue Island line is as follows: One cable rope runs from the power house at Twelfth street and Blue Island avenue out Blue Island to Western avenue; another runs from this power house up Blue Island avenue to Halsted and Van Buren streets and thence to the power house at Van Buren and Jefferson streets. There is also what is called a dead cable that runs in conduit or tunnel from the power house at Blue Island avenue and Twelfth street on Twelfth street east to Halsted, south on Halsted to O'Neil, back north on Halsted to Blue Island avenue, back on Halsted to Twelfth street and to the power house through the conduit. All these cables will be run from the power house at Blue Island avenue and Twelfth street. The down-town loop through the Van Buren street tunnel will be run from the power house at Van Buren and Jefferson streets.

The power house at Blue Island avenue and Twelfth street, which will furnish such an enormous power, is equipped with two 1000 horse-power Allis Corliss engines, two batteries of boilers, four in each, in which oil is used for steaming. Walker differential drums are installed, togeter with Walker friction clutches, which will allow any one of the cables to be stopped without interfering with the speed of the engines. There is a spare set of drums, so that in case of accident to any of the three cables the extra one may replace it. The plant is provided with two 25 ton cranes with travelers, so that in case of accident or for repair purposes any piece of the ponderous machinery may be readily lifted out of place.

The South Blue Island avenue cable, which runs from this power house to Western avenue, is 27,000 feet in length; that north on Blue Island avenue 12,000 feet. The basement of the power house, which contains the tension drums for stretching the cables, has also a complete electric light plant, by which the building is lighted. Both power houses were built by the Pennsylvania Iron Works of Philadelphia. The Halsted street lines will soon be in use. For the present, and until the down-town loop is put in, trailers will be detached from the grips at Van Buren and Jefferson streets and will make the down-town trip by horse-power by way of Van Buren, Dearborn, Adams, Franklin and Van Buren streets, back to connect with the cable at Van Buren and Jefferson streets.

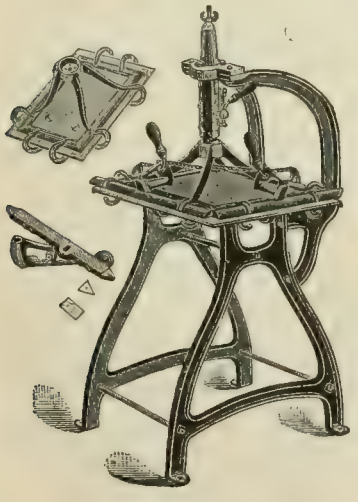
The *Daily Telegraph* of Sheffield, England, reports that during a heavy storm which visited Yorkshire recently large hailstones fell, some of which were weighed and turned the scale at 2½ ounces. The stones perforated the zinc roofing at Sir John Lawson's mansion, Brough Hall, Richmond, "riddling it as if with rifle bullets."

It is proposed that an exposition by the prize winners at the World's Fair be held in the Grand Central Palace, New York, in February and March next. An opportunity will also be given to local merchants who are not represented at the World's Fair to make exhibits of their wares at this exposition. Information can be obtained from the Manhattan Industrial Exposition Company, 122 West Twenty-third Street.

ROOFING AND CORNICE.

Quadruple Roofing Folder.

The illustration shows a machine recently patented by M. E. Hastings, New York Mills, Oneida County, N. Y. It is for edging sheets of tin plate for roofing, whether it is to be put together in rolls or to be used one sheet at a time, as in flat-seam roofing. In either case all of the edges are turned at one time, and as quickly as one edge could be turned in a folder. The action of the machine, it is pointed out, is so simple that a boy or common laborer can edge the sheets accurately and with great speed, 40 boxes being designated as an easy day's work. The machine consists of two side frames, supporting a bed, and an overhanging arm, to which is attached the sheet clamp. On two sides of the bed is a thin steel plate, over which the edges of the sheet are turned down. On the other two sides are adjustable guides



Quadruple Roofing Folder.

to hold the sheet in proper position and regulate the width of the edge. On the sheet clamp is another steel plate, over which the edges of the sheet are turned up when all four edges are required, as for single-sheet flat roofing. The clamp works vertically and perfectly true through the arm, subject to a spring to raise it, and holds the sheet down by means of a compound eccentric. It is operated with ease by a short lever. On each of the four sides of the bed and clamp are two half-circle bearings, making a complete circle when the clamp is down. In these bearings are four brakes, shown in the cut, two of which are connected by a strong chain with the other two, which have handles. To edge a sheet, the machine being open, put a sheet in against the guides, push down on the clamp lever which secures the sheet, then take hold of both brake levers and push them down and all of the edges are folded. A ball weight being a part of the brakes, they drop back out of the way as soon as released, and one hand releases the clamp, when the spring lifts it out of the way, while the other hand withdraws the sheet, with all four of the edges turned. If the sheets are to be edged for making into a roll the two brakes are unnecessary, and can be simply lifted out and the small square plates shown in the cut screwed fast to the ends of the brakes in use, instead of the triangular plates. The cut shows the machine with a bed and clamp for 20 x 28 sheets, and above it the same parts for 14 x 20 sheets, which are interchangeable. A claim made for the folder is that it overcomes the necessity of squaring the sheets before edging. The clamp and the bed plate make a perfectly square sheet after the edges are turned, as they take up any inequality. The quadruple folder, though now just being offered on the market, has been under test for several months by some large roofing firms, who give their testimony of its practical excellence. The saving of time and accuracy of results are specially noted.

The Sykes Steel Roofing Company.

The World's Fair exhibit of the Sykes Steel Roofing Company of Chicago, Ill., and Niles, Ohio, is located in section E on gallery floor in the north end of the Manufactures Building. The exhibit is thus isolated from the exhibits made by other roofing establishments, but it is found in company with quite a number of makers of building specialties. The company have erected an attractive pagoda, which forms a very neat office and headquarters, while at the same time it furnishes a practical illustration of the use of their products. Their patent improved standing-seam roofing, corrugated-edge roofing, V crimped roofing, corrugated roofing, sheet-steel brick, corrugated and beaded ceilings, sheet-metal siding and clapboarding are all shown, either as parts of the building or by samples attractively arranged. The walls are covered with Bostwick steel lath, left unplastered in some places to show how it is applied to partitions. The company have issued a fine Columbian souvenir catalogue, which is a really valuable publication, containing practical information appreciated by sheet-metal workers. It gives an illustrated description of the manufacture of iron and steel, taking the raw material at the blast furnace and following it through its different processes in the rolling mill as it is converted into sheets, then into the roofing works, and finally on the roof. The illustrations are very fine and worthy of the subject. It is an admirable book for a sheet-metal worker who has not been in the rolling mill and does not know how sheets are made. The company have two plants, one at Niles, Ohio, and the other at 611 South Morgan street, Chicago, both well equipped with the most modern machinery for the manufacture of roofing.

FLASHINGS.

SOME HANDSOME THINGS in sheet metal are the ornamental panels for a bank at New Rochelle, being made by Lyles & Mills at 231 William street, New York.

A GOOD AMOUNT of trade is being done in sheet iron in Minneapolis and St. Paul, according to local reports. Building operations are on a fairly large scale and have become so far advanced that a considerable amount of roofing is being done, calling for large quantities of this material.

ENGLISH trade journals speak of a growing demand for galvanized iron sheets in South America and South Africa.

A WRITER in the *Country Gentleman*, taking for his text an advertisement of some cheap roof protector, strongly recommends the use of pure linseed oil for this purpose. He says: "We have about 2580 square feet of iron roof. Once a year I send a lad up with a gallon of oil, which he spreads over it. This seems better than paint, as it will not crack or blister off and allow rust to go on below. It also takes much less to cover. The iron had a coat of red paint when first put on. By this simple and easy treatment I expect to see the iron roof last 50 years."

REARDON & ENNIS, 311 River street, Troy, N. Y., recently placed seven of their 36-inch Electric ventilators with connecting pipes on the Clinton State Prison at Dannemora, N. Y. The contract made with the State provided that the ventilation of the prison must be satisfactory to the authorities before payment should be made. That they have proven entirely satisfactory is shown by an excellent testimonial recently given to the firm by the doctor of the prison. These ventilators are also being used largely by paper mills and dye houses, the claim being made that they carry off all condensed steam and heated air that otherwise accumulates in the skylights and ceilings.

BY A DECISION of the Vermont slate trust the quarries of that section will be worked only four days in the week, beginning from last Monday, and on September 1 a 10 per cent. reduction in wages will be made.

THE CAMBRIDGE CORRUGATING COMPANY, Cambridge, Ohio, after being in business a little over one year, have vacated their leased building and moved into their own new factory, built especially for manufacturing a complete line of corrugated roofing and siding, and a variety of iron and steel products for building purposes. The new building is adjacent to railroad tracks and has excellant shipping facilities. New machinery and modern conveniences are employed. The officers of the company are T. E. Amos, president; C. S. McMahon, secretary; P. C. Patterson, general manager; W. L. Stanley, superintendent.

A patent has been granted to George L. Shorey, Lynn, Mass., for an improvement in heating apparatus, one object being to provide the mechanism that will operate, under thermostatic influences, a damper which requires considerable power to actuate it. In the patent specification a water motor is described for operating the thermostat, the regulation depending upon the supply of water to the motor.

PLUMBING and GAS FITTING.

A Review of Recent Plumbing Practice.*

BY GLENN BROWN, F.A.I.A.

The methods of planning and jointing pipe and setting fixtures in plumbing a house 15 years ago are interesting as a contrast showing the lack of intelligence, both of the designer and the workman, at that period.

Terra cotta pipes were used under buildings. The joints for branches were usually made by pecking a hole into the larger pipe and inserting the small one. No care was taken as to alignment of the whole. The spigot ends of the pipe were inserted into the hubs, carelessly as to contact, level or grade, often without cement. Old house sewers of this date when taken up have been found invariably acting as conduits for and distributing filth through the joints into and contaminating the soil beneath the house. Cast-iron pipe when used was then uncoated. For bends and branches there were few fittings, the ordinary method of branching being similar to that adopted with the terra cotta, pecking a hole and sticking in the end of the small pipe, this forming a projection on which foul matter could collect. The joint was covered with putty. Piping systems were never tested. The only tight joints made during this period were where lead soil pipes were used with wiped joints, the work being done by some old English or Scotch plumber. No system of pipe trap or local ventilation was in use.

The pan closet, with its large concealed receptacle for filth, was used everywhere. All plumbing fixtures were concealed by wood work, with numerous dark and inaccessible places in which the germs for filth diseases had a quiet and uninterrupted opportunity to breed. Fifteen years ago there was no literature on the subject, except a little in books on engineering or water supply, and the only way in which an architect could inform himself was to get instruction from the most intelligent plumber of his acquaintance, or begin the study of the appliances and practice as he found them, and improve on such methods according to his common sense, his mechanical, or scientific ability.

PLUMBING LITERATURE.

One of the first articles to call attention to this lack of knowledge was a series in the *Atlantic Monthly* by George E. Waring. The first article, published in 1875, and continued in 1878, advised reform and advocated an open soil pipe. Following this, in 1878, T. M. Clark wrote quite a practical series for the *American Architect* on "Modern Plumbing." By this it can be seen that the civil engineer and the architect instigated the reform. These articles and articles in the *Sanitary Engineer*, about the same date, were the first to advocate trap ventilation, the *Sanitary Engineer* giving a section of a house with all traps vented. The literature on the subject since that time has increased, but there is still a decided need for a thorough work on this topic.

S. S. Hellyer, prominent dealer in plumbers' supplies, a manufacturer and plumber in London, has written two practical books from the English standpoint, one in 1880, another in 1882, in which the methods and advice given are good, but it is simply an exposition of the English way of doing the thing.

P. J. Davies (1887), who is another English manufacturer and plumber, has put upon the market an elaborate work on plumbing as he thinks it should be done. This book is full of crudities, bad methods and poor advice as to appliances and arrangements, Mr. Davies being a man evidently full of his own wrong ideas and determined to enforce them.

W. P. Buchan (1876-1883), a Scotch plumber, gives in his book a short practical account of the English or Scotch methods in vogue, with little effort to make his book more than an elementary treatise.

The writers on the subject in England (with the exception of Latham and Denton, who devote a portion of their works on sanitary engineering to plumbing) have been tradesmen, not professional men, and the books lose for this reason, not having the breadth, scope or literary qualities that might be expected from a professional or scientific man. Hellyer's books are still the best exposition of the English practice, being confined practically to methods of lead piping and descriptions of English appliances. The only modern French work on the subject is F. Liger's "Fosses d'Aisance Urinoirs et Vidanges." This is a thorough description of the peculiar contrivances used at the time (1872) in France, a large sheet-metal pipe extending from closet to a large barrel or other movable receptacle. This portable cesspool when full is removed. The peculiar apparatus for separating fæcal matter from the urine is described, showing how the urine escapes in sewers and how the barrels (fosses mobile) are removed. The apparatus and disposal appear peculiarly antiquated, while the odors which arise from them must be intensely disagreeable. The arrangements described, I understand, are still largely in use in Paris. Other foreign literature on the subject is of little, if any, practical value except as a means of calling public attention to vital matters, either books or pamphlets by alarmists like Dr. Pridgden Teale ("Dangers to Health"), or by physicians who did not understand the practical side of the question, or by inventors or manufacturers who desire to push their wares.

In America the writers are limited to George E. Waring, E. S. Philbrick, T. M. Clark, J. P. Putnam, W. P. Gerhard, J. C. Bayles and myself. The plumbers in this country have done nothing by way of adding literature to advance the trade, and in many instances they have opposed such advances.

The books published in this country do not give more than an elementary or partial treatment of the subject. The majority of them discuss it only from a sanitary standpoint.

Mr. Clark's articles, already referred to, are simply a short series covering the ground in only a general way.

Philbrick in his book treats the subject only as an incident to American sanitary engineering.

J. C. Bayles writes principally of hydraulics and water supply, ignoring what we would call plumbing proper, although the title of his work would indicate a treatise on plumbing.

Waring's and Putnam's books are largely descriptive of their own inventions, many of which have excellent points, but in a treatise on the subject should probably take less space than has been given them.

W. P. Gerhard has written three small works on house drainage, which constitute the best American treatment.

These books are small and cover the ground only in an elementary way, and principally point out their availability from a sanitary standpoint. He practically avoids in his works the question of trap ventilation.

The book I have published describes simply the one subject in plumbing—water closets, and the pamphlet that of trap syphonage.

We have no book descriptive of American plumbing of the same thoroughness that the work of Hellyer gives to the English practice, and at present there is no book which gives more than a partial, local or very elementary discussion of the trade as practiced in our own and other countries. Among the magazines, the *Engineering Record* of New York, formerly the *Sanitary Engineer*, deserves great credit for its determined and persistent advocacy of all real improvements in plumbing, and of the proper systems of piping and ventilation. The care with which all matters are sifted before they appear in this journal is to be much commended. Great credit should be given also to the *American Architect* of Boston, which has published many articles in this line, and held its columns open for discussion.

Other magazines have used little judgment in the selection of articles; they have been either exaggerated for the purpose of an alarm, have been fulsome puffs of inventions or systems, or show a great lack of knowledge on the subject they have allowed in their columns. This agitation has produced a revolution in plumbing practice during the last ten years. The first and principal gain has been the adoption by the principal cities of plumbing regulations. Although these regulations are not all good, and the best of them are not free from defects, still the worst of them require plumbing which is far in advance in arrangement and execution over the ordinary work in vogue 15 years ago.

PLUMBING REGULATIONS.

Washington claims to be the first city to adopt plumbing regulations. These have been improved from time to time, and last fall they received an extensive revision. Washington now requires all master plumbers, before they can practice their trade, to pass an examination. This I consider a great advance and worthy to be adopted by cities that have not at present put such laws into execution, as it certifies to a plumber having at least a limited knowledge of his trade and a capacity to do his work. The requirement of city inspectors and the testing of pipe systems by water and air are excellent points attained.

A recent improvement in terra-cotta pipes has been increased thickness, depth of hub and ribs in hub and spigot. In all good work in recent years light cast-iron pipe has been discarded, heavy iron being used in its place. Several companies are now testing their cast iron pipe by hydraulic pressure before sending it out. This is a decided gain, as cast-iron pipe of the best make was liable to sand holes and other defects, many of which were covered by the pitch or other coatings. Instead of the old method of cutting holes in pipes of either terra cotta or iron, fittings are now furnished suitable for every contingency that may arise in ordinary practice.

One of the best modern improvements is the introduction of wrought iron and steel pipe with screw fittings, by C. W. Durham, for house sewerage. This gives a rigid piping system in no way depending on floors, which may rupture the joints in ordinary systems by settlement or shrinkage, and at the same time gives an opportunity for absolutely tight joints in pipes and connections with fixtures.

LIFE OF PIPE.

Data as to the life of pipes and effect of coatings in ordinary use have been accumulating slowly. Lead pipe is practically indestructible; many pieces are still in perfect condition that were in use in Rome, Pompeii and other cities 2000 years ago. Iron, which has come into such extensive use during the last few years, is subject to destruction by oxidation. How rapidly and under what conditions this occurs is a matter of importance.

Fresh water oxidizes wrought iron more quickly than it does cast iron, while salt water seems to have an opposite effect.

The rate of wear on wrought-iron supports where subjected to action of air and water alternately is apparently 1 inch in 20 years, as proved by supports on lighthouses. Cast-iron pipe fails from accretions on the inside when used for water supply, peculiar nodules filling the interior of the pipe. This trouble has been encountered in all the cities where cast-iron pipe was first used. This seems to be particularly the case with soft waters. For soil pipe the slime which adheres to the interior seems to protect both cast and wrought iron, and the necessity is to guard the pipe from destruction on the exterior. Where the pipe is

*Prepared for convention American Institute of Architects. Read by courtesy of the institute at World's Congress of Architects in Chicago, August 4, 1893.

subjected to a constant change of conditions—*i. e.*, action of air and water alternately—it deteriorates rapidly. Pipes taken from the streets of Alexandria, Va., laid in gravelly and made ground, buried in 1851 and taken up in 1885, were practically worthless, being soft and easily pulled apart with the hand, while pieces buried in clay soil were perfect.

The city engineer in Philadelphia informs me that he has found the same to be a fact in Philadelphia, and others have noted the same effects. It seems needless to say that paint will protect the exterior if put on before oxidation commences (red lead forming the best first coat), otherwise oxidation will go on beneath the surface of paint. Pitching or asphalting seem to act as a preservative, although there is very little positive data showing how long such coating will protect the pipe. Iron pipe may be obtained dipped in metallic paint; this answers but a short time. Galvanizing is but a trifle more effective. Enameled iron pipe, if the enameled surface can be kept intact (not an easy task), would form an ideal pipe for interior protection. As soon as oxidation commences it chips, and the whole surface is rapidly fluxed off. The Bower-Barff, or rustless iron pipe process (where it is not necessary to cut through the surface, or where it is treated after the pipes have been cut and fitted), seems to have answered its purpose well for both wrought and cast iron during the short time it has been in use, but its effectiveness is weakened by the necessity for cutting and fitting pipes while work is in progress.

THE EFFECT OF PIPES ON HEALTH.

Lead pipe has been traditionally injurious to health from the time of Vitruvius, two thousand years ago, to the present day. In spite of this tradition millions of people have been drinking water through it from that day to the present time, and it seems to be doubtful if one well-authenticated case of lead poisoning by the use of lead pipes has been found.

Lead tanks subjected to the action of air and water alternately are undoubtedly injurious, but the opinion of all experts who have recently examined the question quite thoroughly in France, England and Germany is that lead pipe is not to be feared except in unusual circumstances, to which it is never subjected in actual use.

Paris uses it in 39,500 houses, Berlin in 20,000; yet no case of poisoning could be discovered by a commission appointed to examine into the question. The British Institute of Civil Engineers makes a similar report. Ten million people daily drinking water through leaden pipes would probably be a very low estimate of the fact, and still not a case in a year even attributed to lead poisoning by this means.

(To be continued.)

TRAPS AND VENTS.

E. J. BRADY, plumber, at 58 Warren street, New York, does not confine his sheet practice to metal, but is a yachtsman perfectly at home at the main sheet.

AT BUFFALO, N. Y., there is trouble between the Master Plumbers' Association and the Journeymen Plumbers' and Steam Fitters' Association, the latter having submitted to the former several articles for adoption, which, owing to their unsatisfactory nature, on a vote were returned and the Conference Committee discharged, cutting off further communication.

ROBERT CORNELIUS, who over 40 years ago formed the house of Cornelius & Baker for the manufacture of gas fixtures, died recently at his home in Frankford, near Philadelphia, at the age of 85 years. Several years ago he retired from active business and gained an extended reputation as a grower of fine fruit on his farm.

CORBIN & BEATON are a new firm who are about to start manufacturing plumbers' supplies at Southington, Conn.

THE HEALTH DEPARTMENT at Buffalo, N. Y., is having some trouble with the milk dealers who, from ignorance, fail to comply with an ordinance providing that the drainage pipe from a milk box should run to an open receiver and the receiver connect with the sewer through a trap.

J. H. MCPARTLAND, Houlton, Maine, has sent plumbers to Ashland and Presque Isle to do several jobs of work.

A REDUCTION in the force of plumbers at the Brooklyn Navy Yard brings a charge that points to political complication, but the officers say that this class of labor has by a system of registration been removed from the patronage to be dispensed.

THE JENNISON PLUMBING COMPANY, Leominster, Mass., have closed out their stove business to Webber & Hayward, who continue as agents for the same line of goods in Leominster and Fitchburg.

THE PLUMBERS' UNION of New England, at their convention at Boston, Mass., last week, were found to be in excellent condition, and plans were made for a more thorough organization throughout that section.

A DIFFICULTY between the inspector and master plumbers of Flushing, N. Y., has been amicably adjusted, the inspector resigning and E. G. Roff being appointed to fill the office from September 1.

A MORE RIGID ENFORCING of the plumbing regulations in Pittsburgh, Pa., and the attending experiences, has provided ample excitement for some of the local plumbers and the citizens. Some additional restrictions, it is supposed, will result.

H. M. FIELD, 57 Main street, Fitchburg, Mass., is the address of a new plumbing establishment.

THOMAS P. WATTS, a well-known plumber of Louisville, Ky., is a candidate for alderman.

THE OFFICERS ELECTED by the Master Plumbers' Association of the City of Hartford, Conn., for the ensuing year are: President, James Ahern; first vice-president, Edward Lawler; second vice-president, George Mahl; recording secretary, John S. Craig; corresponding secretary, James F. Duffy; financial secretary, T. Oakes; treasurer, Edward Mahl; sergeant-at-arms, John Smith.

A LITTLE CIRCULAR from the Standard Mfg. Company, Pittsburgh, Pa., shows Young's adjustable boiler stand, which can be readily increased 12 inches in hight and adjusted at each intermediate ½ inch. Many boilers are set lower than the plumber would prefer, owing to the fixed hight of the boiler stands in general use. Better circulation would often be secured if the bottom of the boiler was nearer on a level with the top of the water back. There are many advantages in a boiler stand that can be adjusted in hight to suit the case.

THE PLUMBERS' REGISTRATION BILL, which was presented to the British House of Commons and referred by that body to the Grand Committee on Trade, was returned last week to the House with an unfavorable report on certain points in the proposed measure. It is thought that the bill is killed for the present session of Parliament, and that it will have to be considerably modified in order to get a chance of passing into law.

The largest consignment of gold that ever reached the United States in one vessel was landed from the North German Lloyd Company's steamer "Spree" at New York last week. It amounted to $4,250,000, packed in 126 boxes, the whole weighing some six and a half tons.

HEATING AND PLUMBING.

NEW WORK AND CONTRACTS.

THE old steam heating plant at Yale College, New Haven, will hereafter be used for heating the brick row, Farman, Lawrence and Durfeel dormitories, and a new plant, to cost $50,000, will consist of a new boiler house. Five of the largest boilers ever used in Connecticut for heating alone will be erected for Alumni and Dwight halls and the old and new libraries and the Commons.

IN the next two months a new steam heating plant, at a cost of over $14,000, will be installed in the New York Post Office. The old radiators and pipes that have been in use 17 years are being removed. The steam has been supplied by the New York Steam Heating Company, but after their contract expires it will be discontinued.

THE Westville, Conn., Board of Education has decided to heat the school building with hot water, and appointed L. W. Beecher, M. E. Terrell and Amos Dickerman a committee to select a system and make a contract.

A HEATED discussion and a long session was held by the school board of Eau Claire, Wis., which resulted in the contract being divided, Richardson & Hobbs getting the Alexander School at $1300, the Smead Warming & Ventilating Company getting the Lincoln School at $1000, and Fuller & Warren getting the heating and closets for the Frawley School at $2072.

THE old worn-out heating apparatus in the Jersey City, N. J., High School is to be replaced with a steam heating plant.

THE contract for heating and ventilating the Goodnow Memorial School, at East Princeton, Mass., has been awarded to the Hub Plumbing, Heating & Stove Company of Clinton, Mass., who will use the Smith & Anthony Company's system.

LEARNED & BROWN, plumbers and steam fitters, Waterville, Maine, are installing a hot-water heating plant in that city and another at Oakland.

LE VALLEY & JENKINS of Corning, N. Y., have secured the contract for the heating and plumbing work in a new church and parochial school there.

THE heaters in the Bennington, Vt., graded schools will be replaced by a steam heating plant and the halls will have a similar system.

THE trustees of the academy at Rose Point, Pa., intend improving the heating arrangement of the building before the fall term begins.

WM. MORAN of Titusville, Pa., has the contract for the heating plant for the Oil City Hospital.

A No. 55 VICTOR BOILER, made by the Richmond Stove Company, Norwich, Conn., and 500 feet of radiators will be installed by steam fitter White of Oxford, for heating the almshouse at Manchaug, Conn.

THE new steam heating plant in the Maine Central depot at Augusta was recently completed by W. B. Smiley of Waterville.

Canadian Pacific Railway reports indicate that the crops in the Northwest of Canada will far exceed the yield of last year.

THE LETTER BOX.

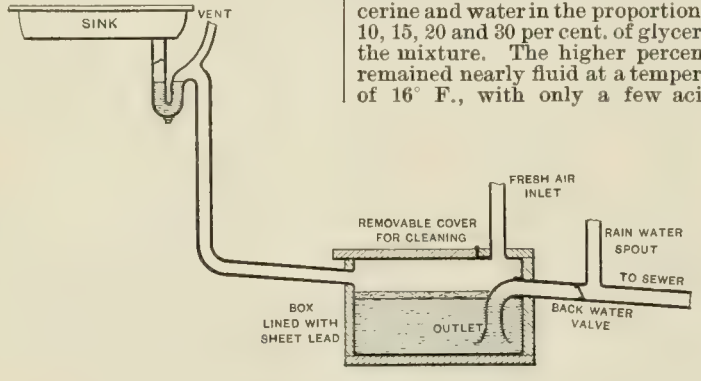
Tool to Re-seat Basin Cocks.

From W. J. H., *Newark, Ohio.*—Can *The Metal Worker* give me the address of the manufacturer of a tool to re-seat bibbs, basin cocks, &c.?

Note.—These goods are usually made on a lathe with ordinary lathe cutting tools, so that it is hardly probable that such a tool as seems to be wanted is made. If any of our readers have devised some quick means for doing such work there are many who would like to know it.

Theory of a Grease Trap.

From YOUNG MECHANIC, *Marshall, Texas.*—Will the plumbers and *The Metal Worker* give me some advice concerning grease traps? I am to fit up a hospital soon and a kitchen sink is desired, but there is a fear that



Theory of a Grease Trap.

grease will stop the sewer. I have tried to explain how this could be avoided by the use of a grease trap, but a doubt exists and more information is wanted concerning the subject than I am able to give. A discussion on this subject would be a benefit to a great many. The sketch shows the simplest trap I know, though in this case cost is less important than a trap that does the work and does not get out of order.

Note.—We give our correspondent's request to the plumbers who have had experience with grease traps. The sketch submitted shows the plan proposed, which corresponds with the principle observed in grease-trap construction. The idea is to provide a trap large enough to receive a considerable discharge of greasy water and hold it till the grease has risen to the surface, where it is held until removed, leaving the water below practically free from grease. The water line in the trap is maintained above the outlet by running the outlet pipe down below the water line and near the bottom of the trap. This allows the clear water at the bottom to pass off without leaving any deposit in the sewer whenever the trap receives a new discharge. The trap tends to cool hot water and harden the greasy accumulation, which floats on the water and is held until the cover is taken off the trap and the grease removed. Frequent cleaning will avoid the possibility of the hardened grease being flushed through the trap or odors arising. The cleaning will be more certain and frequent if care is taken to locate the trap where it can be done with ease. To vent the trap as a precaution is commendable, though not generally done, as the cover is supposed to be air tight.

Glycerine in Traps.

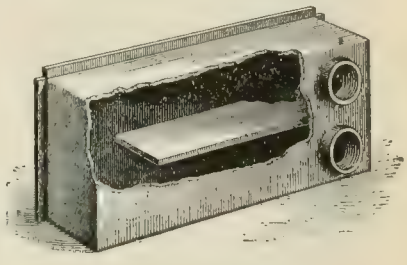
From G. D. HISCOX, *New York.*—Noticing an inquiry in regard to the use of glycerine in traps and air pumps of gas machines in your issue of June 24, a statement of trials may be in order. During the coldest weather of the past winter I tested the freezing condition of various mixtures of glycerine and water in the proportions of 5, 10, 15, 20 and 30 per cent. of glycerine in the mixture. The higher percentages remained nearly fluid at a temperature of 16° F., with only a few acicular crystals of ice, which floated in the mixture. With the lower percentages they were increased in quantity, and with the lowest, or 5 per cent. solution, solid freezing could not be had at 16° F., only a soft, mushy mass, easily stirred, and with no mixture above 3 per cent. could I obtain a solid cake of ice that would endanger the bursting of thin glass bottles. I have recommended a 3 to 5 per cent. mixture for many years in fluids liable to freeze in transportation, wherever its mixture is not objectionable in the use of the articles. I consider it safe and cheap to use in house traps, air pumps for gasoline lighting, and wet gas meters. It does not absolutely prevent the evaporation of the water, but so largely retards it as to make its use desirable. The crude glycerine is not expensive, is odorless, and far preferable in house traps to kerosene, which will saturate a house and furniture with its odor to an offensive degree when closed for a winter season, as our summer residences generally are.

Wants the Plumbers' Opinions.

From M. C. H., *Portland, Maine.*—Will *The Metal Worker* please ask the plumbers to give their opinion on the trapping of water closets? Is it best to use lead or enameled iron for short hoppers?

Trouble With a Water Back.

From J. P. & S. *Haddonfield, N. J.*—In reply to "F. M. B." of Washington, N. J., and others of your correspondents respecting the trouble we had with a water back, as described in *The Metal Worker* of July 17, we take pleasure in saying that we have discovered the cause of the trouble. It was due to a sand hole in the partition of the water back, between the inlet



Trouble with a Water Back.

and outlet pipes, as will be seen by reference to the sketch which we send you.

This prevented the water from circulating as it should. I called at the house this morning, and after a fire was started, in one hour's time the water was very near the boiling point. so that everything is working satisfactorily and the landlady and we are happy. I send this for the information of your correspondents and also in the hope that it will stimulate others to write letters about their difficulties and the way they overcome them.

Size of Outlet for Force Pump.

From W. M., *Point Arena, Cal.*—I have a double-action force pump with 1½-inch suction pipe to connect with a well 20 feet deep, and I wish to elevate the water 75 feet to a tank. What would be the proper size of pipe to use for the outlet?

Answer.—For a pump under the conditions mentioned we think a 1¼-inch pipe would be the proper size to use for the outlet.

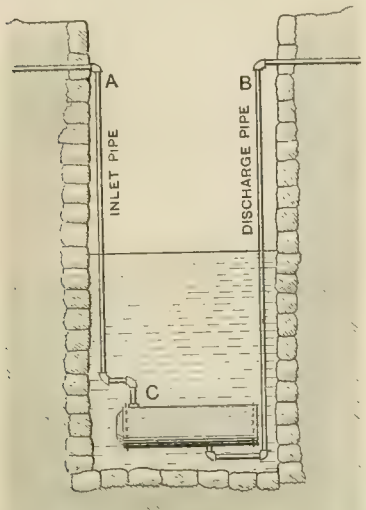
A Question of Discount.

From A. C., *South Manchester, Conn.*—A purchases of B 50 barrels of flour at a given price, less 25 per cent. and 2 per cent. discount for cash. A receives the goods, pays the freight charges, carts the flour to his store, and finding it tallies with the invoice, draws a check to settle the account. The question is, should the freight charges be deducted before or after the discount has been taken off?

Note.—This is a subject which comes up periodically for discussion and concerning which there appears to exist in the trade a difference of opinion. Generally speaking, however, it may be said that the majority incline to the view that the discount should be deducted from the face of the bill and after that has been done take off the charges for freight.

Trouble with a Well Cooler.

From E. D. S., *Atlanta, Ga*.—I notice in *The Metal Worker* of July 1 a communication from "P. R. F.," describing a water cooler with which he had trouble. If he had made his inlet connection at the highest point of



Trouble with a Well Cooler.—Fig. 1.—*Top and Bottom Connections.*

the reservoir he would have overcome all of the difficulty in connection with his cooling apparatus at once. In Fig. 3, which shows the position of his tank, the upper part contains a body of air which cannot escape, and consequently when he draws water at the sink the confined air tries to make its escape, which causes the water to flow or rush at once to the pipe. Let him

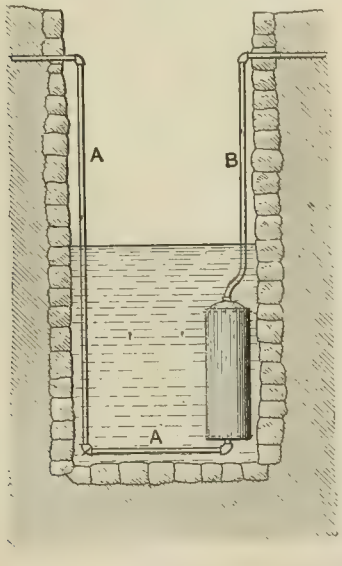


Fig. 2.—*Well Cooler Placed Vertically.*

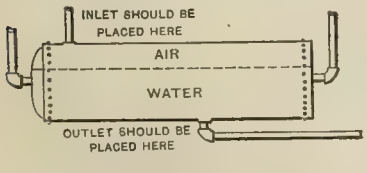


Fig. 3.—*Showing Air-Bound Tank.*

tap the tank at the highest point, as shown, and he will overcome all trouble with his cooler. Or he might adopt the plan shown in Fig. 1, which accomplishes the same result. The best plan, however, is shown in Fig. 2. By placing the tank in a vertical position he gets the full benefit of all the cooling surface.

Capacity of Tanks.

From D. B., *Passaic, N. J.*—Please give a rule for determining the number of gallons square and round tanks will hold.

Answer.—There are 231 cubic inches in a gallon. For a square tank reduce the dimensions of the tank to inches, and multiply the length by the width and the result by the hight, which will give the number of cubic inches in the tank, and by dividing this sum by 231 the result will be the number of gallons the tank will hold. For a round tank reduce the dimensions to inches, then square the diameter, which is to multiply it by itself, then multiply the result by the decimal fraction 0.7854, and the result will be the square inches of area in the circle. Multiply these square inches by the number of inches in the hight of the tank, and the result will be the number of cubic inches in the tank, and by dividing that by 231 the number of gallons will be known. A gallon of water weighs about 8⅓ pounds, and if multiplied by the number of gallons the weight of the contents of the tank is found.

Tapering Furnace Pipe.

From CÆSAR, *Louisville, Ky.*—I notice an article in *The Metal Worker* of August 12 in regard to tapering furnace pipe. Would say that I do not care to enter into any discussion of the question further than to say that the position taken by both parties is untenable, for reasons as follows: First, to taper from 9-inch collar to 12-inch pipe will not give as much benefit as a straight 9-inch pipe, for the reason that you will lose a given amount of heat force through the increased radiating surface of the 12-inch pipe over the 9-inch, and the effect of this loss of heating radiation will most assuredly decrease the velocity of air through pipe. On the other hand, to decrease from a 12-inch collar to a 9-inch pipe, the pipe, under certain circumstances, will choke and the air will refuse to enter pipe at collar at top of furnace, and the pipe will become cold. Now to the original question. If it were obligatory to taper pipe at either end, I would say unhesitatingly to taper from 9-inch collar to the 12-inch pipe, but do not do this abruptly. In a 12-foot pipe I would run a straight 9-inch pipe for 10 feet and then taper the last 2 feet to register. Then I would lose nothing by increased radiating surface, and would keep my velocity of motion, whereas, on the other hand, I would lose by both.

Repairing Stone Laundry Tubs.

From M., *New York.*—Please let me know through *The Metal Worker* if I can get a cement to repair a light brown stone washtub which was chipped on one edge. The stone is 1½ inches thick and the broken place is 1 inch long, 1 inch high and ⅜ inch deep. The piece has been lost.

Note.—The plan usually followed in repairing is to dress out a place so that a piece can be dovetailed in and secured with a cement made of boiled oil and litharge. As the space is so small, if a little fine sand and Portland cement was used with the oil and litharge a quick-setting durable cement would be made and might prove satisfactory.

Contaminated Well Water.

From J. H., *Richmond, Maine.*—Some three years ago I set a pump to which was connected a lead pipe leading to a well 300 feet distant. The water that is drawn through the pipe smells and tastes badly at certain seasons of the year, especially during the spring and early summer, while that drawn from the well with a bucket is all right. What is the difficulty?

Loss of Water from Boiler.

From A. B. K., *Burlington, Vt.*—Replying to letter from "J. & R.," published in *The Metal Worker* of 5th inst., I have the following suggestions to make: If the draw-offs of the heaters referred to are connected with the sewer the probability is that the draw-off cocks leak and the water runs out into the sewer. I have found that the best plan is to disconnect the draw-off from the sewer, leaving it so that the connection can be easily made when required to empty the boiler. Have a tight valve on the sewer side, which should be closed always except when the connection is made and the water is being drawn off. Have another valve or cock on the draw-off pipe near the boiler. If any leak occurs it can be readily seen.

From H. S. & D., *Charlestown, W. Va.*—"J. & R.," New York, complain in *The Metal Worker*, August 5, of loss of water from heating apparatus. They say: "House owners were continually pouring in water. Sometimes the entire plant had to be refilled. Impossible to find leak," &c. In our opinion, based on several years' experience with several different boilers put into scores of jobs, we say that the users of the plant overfired and steamed the boiler and drove the water out. If not, it simply leaked out. The reason they did not find the leak is because they did not search thoroughly enough. There are just two ways to get water out. It cannot vanish like smoke any more than the iron pipes and radiators can.

Warming a Church.

From C. F. S., *Louisville, Ky.*—In regard to the remarks of "W. B. & Co.," Bangor, Maine, about heating a church, noticed in *The Metal Worker* of May 20, would say that I only noted how the plan adopted could be made to heat the church. If I had to place the job originally, I would have made quite a different plan. I write this to set myself straight in the matter.

Paste for Asbestos Paper.

From W. S., *Brooklyn, N. Y.*—If "M. J. H.," who inquired how to secure asbestos paper to furnace pipe in *The Metal Worker* of August 5, will use water in the following manner he will find it satisfactory: Put one end of the paper on top of the pipe and with a sponge wet with clean water, thoroughly soaking it; wrap it around the pipe and rub it with the hand, making a lap of 2 inches, thoroughly soaking the seam. This will be all that is required, and when dry will look as if it was painted.

A correspondent says Day's Diamond Paste, made by the Day Diamond Paste Company, Albany, N. Y., is first rate for fastening asbestos paper to furnace pipes.

THE TIN SHOP.

Pattern for Two-Piece Elbow.

From W. T., *St. Louis, Mo.*—A convenient method of obtaining the pattern for a two-piece elbow is shown in Figs. 1 and 2. The quarter pattern C F G of Fig. 1 is used for marking off the pattern shown in Fig. 2. To obtain the part of pattern shown in Fig. 1 by C F G, proceed as follows: Draw the line A B and erect the perpendicular C D. With C as center, and with one-half the diameter of elbow as radius, strike the arc E F, which divide into any convenient number of equal parts, as indicated by the small figures. From C on C B lay off a stretchout of E F, through the divisions in which draw the usual measuring lines, as indicated by 1′ 1″, 2′ 2″, 3′ 3″, &c. From the points in E F draw lines parallel with A B, cutting lines of similar number drawn from the stretchout line C G, as indicated at 1″, 2″, 3″, &c. A line traced through the points thus obtained, as shown by F G, will form the required part of pattern. To obtain the pattern of elbow, using for the purpose C F G of Fig. 1, proceed as follows: Draw any line, as H J, equal to the circumference of elbow; bisect H J in K, and, using C F G as a pattern, mark off L M N O, as shown, thus obtaining the pattern line P Q R. The part of pattern indicated by S T U V is then to be drawn in the usual manner. Edges for joining are to be allowed on S T and U V. As a matter of convenience the pattern in Fig. 2 is drawn to a reduced scale.

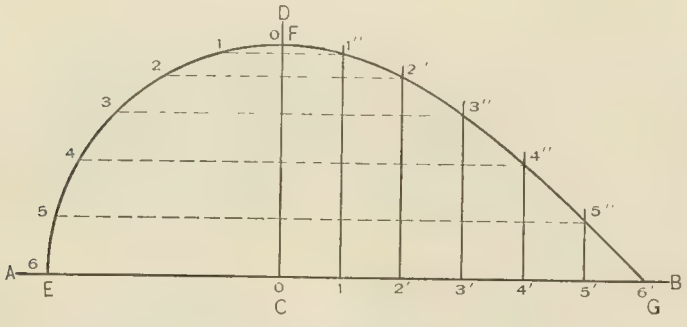


Fig. 1.—Method of Obtaining the Quarter Pattern.

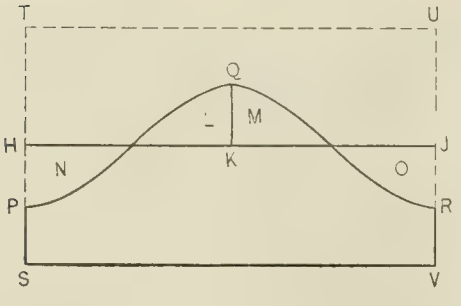


Fig. 2.—Pattern Obtained by the Use of Part Similar to C F G of Fig. 1.

PATTERN FOR A TWO-PIECE ELBOW.

Work Bench Edge Protector.

From L. M. W., *Delaware, Ohio.*—The edge of my work bench having worn out, particularly at the top, I sawed out a strip of it 2 inches wide and fastened in the place a piece of wrought iron 2 inches square. The iron was long enough to rest on two of the bench legs or supports, and I had ⅝-inch holes drilled in it and countersunk very deep, so that I could screw it securely to the bench and not have the heads of the screws project. Before I screwed it in place I cut some holes for some of the stakes in the edge of the bench with a saw, and the iron fitting against them makes the support complete. Since I have had this long, true and strong edge on the bench I have found it of so much value to me that I thought some of the readers of *The Metal Worker* might be glad to know of it.

A decision favorable to the Chicago Power Supply & Smoke Abating Company has been given by the Chicago courts, permitting them to proceed with the work of laying a conduit through the business part of the city for the supply of compressed air at 100 pounds per square inch. The air will be sold at a fixed rate for power purposes and for ventilating theaters, schools, hospitals, &c.

Radiant Heat.

The remarkable results obtained by Professor Dewar from the use of high vacua as a means of preventing the transfer of heat have not yet excited the attention the discovery deserves, says the London *Engineer*, probably because the importance of it has been masked by the brilliant and exciting investigations which have ended in the liquefaction of air and oxygen on a comparatively large scale. There can, however, be little doubt that when men of science have time to sit down and quietly digest the information which Professor Dewar has supplied they will see that the fact that oxygen can be liquefied is as nothing compared to the fact that heat cannot jump over what may be termed an empty space with anything like the facility hitherto supposed. If this be true—and there is really no reason to doubt it—the whole theory of radiant heat requires important modifications, and nearly all the elaborate mathematical investigations that have been based on this theory become worthless.

Radiant heat has long been regarded as the analogue of light. A body surrounded by other bodies of a different temperature either gains or loses heat, tending always to the condition of equilibrium with its surroundings. The text-books tell the student that when a body cools it is parting with its motion, and sending, according to the undulatory theory, waves through the ether. While it was thought that caloric was itself a fluid, it was believed that this fluid streamed away from a cooling body through space. When caloric disappeared from the realms of science, ether waves took its place in discharge of numerous functions, and not the least difficulty or hesitation was experienced in explaining what heat radiation is. The similarity existing between it and light was demonstrated, for example, by the well-known concave mirrors, glowing charcoal and lump of ice experiment. The precise amount of heat radiated from the sun has been calculated in terms of cubic miles of coal burned per minute, and so on. Professor Dewar now comes forward and proves that the ether alone cannot transmit heat at anything like the rate commonly postulated. At one stroke he has robbed the mysterious ether of half its virtue. The sun is, perhaps, not cooling at all, perhaps cooling at an infinitely slow rate. The whole cosmical theory, built up with so much care on a foundation of secular cooling, vanishes into thin air. Lord Kelvin and his co-workers will have to begin all over again and formulate new theories, and all because Professor Dewar has shown that heat cannot pass in the way hitherto supposed the apparently insurmountable barrier offered by a few inches of space in which exists the nearest approach to a vacuum.

It has been known for years, although little has been said on the subject, lest, we suppose, the minds of students should be unsettled, that the undulatory theory of light is very nearly as unsatisfactory as a theory can be. It breaks down completely over double refraction, while it leaves everything to be desired as regards metallic reflection. Lately it has been shown, too, that the idea that undulation can take place in an absolutely continuous fluid is open to question, while the theory that the ether is discrete or molecular involves difficulties not less important, though different in kind. It would seem now that the apparently firm ground on which the phenomena of radiant heat rested has been cut away, and that the ether—useful servant-of-all-work as it has been—can no longer serve our turn to the extent supposed. As it has failed to account for all the peculiarities of light, so now it fails to explain those of heat.

It will, perhaps, be argued that, although the ether cannot transmit dark rays of heat, it can transmit light rays, and that, as a consequence, the sun can send heat to the earth and into space. We do not possess sufficient information as yet to be able to speak positively on this point; nor is it, indeed, necessary. Professor Dewar's far-reaching discovery—we say "discovery," because there was no good reason to assume beforehand that empty space could be much superior to a gas at rest as a non-conductor—supplies sufficient food for speculation as it stands. Let us take it for granted that only dark heat is preserved in a planet, and we see that even with this limitation the geological and astronomical phenomena involved are of stupendous influence. If there is no gas in space, nothing but the mysterious ether, then this earth, for example, cannot have cooled in the way hitherto supposed, by the radiation of heat into space. It may be answered, of course, that we know that the sun radiates heat because the world is warmed by his rays. That he transmits energy to us in some way across space is certain, but is it at all certain that it has any existence at all as heat in space? To illustrate what we mean, let us suppose that a stream of shot was suffered to fall from a lofty tower on a metal plate. The plate would be heated, but it would be very incorrect to say that the heat had been sent as heat from the top of the tower. Clerk-Maxwell, writing on radiant heat, says: "Substances which admit of radiation taking place through them are called diathermanous. Those which do not allow heat to pass through them without becoming themselves hot are called athermanous. That which passes through the medium during this process is generally called radiant heat, though as long as it is radiant it possesses none of the properties which distinguish heat from other forms of energy, since the temperature of the body through which it passes, and the other physical properties of the body, are in no way affected by the passage of the radiation, provided the body be perfectly diathermanous." It is quite possible to conceive, not only that the sun's energy has been transmitted to us in a form bearing no resemblance to heat, but, again, that the amount of energy thus lost by the sun is limited by the planets or other bodies on which it is expended. That, in other words, if the planets were annihilated, the sun would no longer lose energy. These and various other speculations suggest themselves as a matter of course. To answer them finally, yes or no, is not yet possible. It is to be hoped, however, that Professor Dewar will extend his investigations on the relations obtaining between high vacua and heat transmission. In every-day life the engineer is perplexed with problems which have never yet been solved. For example, why is it that the radiant heat in a fire box is of such great value as a steam maker, and yet that, whether we use it or not, so little effect appears to be produced on the temperature in the smoke box? The whole subject of radiant heat has been in a most unsatisfactory condition from the first. Professor Dewar has found confusion and left chaos. Let us hope that out of the ruins will be built up a really satisfactory and substantial structure; but this cannot be done until the true import of the Royal Institution experiments has been realized by our scientific world.

It must be supposed, however, that Professor Dewar goes so far as to assert that heat cannot be radiated at all across a vacuum. He holds that the expression, "radiant energy," must be confined strictly to vibratory energy transmitted by the ether, as distinguished from the transference brought about by gaseous matter. The true bearing of his discovery seems to be this: Hitherto it has been held that the radiation of heat, as in a fire box, was effected almost, if not altogether, by the ether, and that the clear, transparent gas, such as carbonic acid, rather tended to check radiation than to promote it. Professor Dewar's experiments go to show, however, that this view is mistaken, and that if there was a perfect vacuum in the fire box above the glowing fuel, only very little heat indeed would pass to the plates, although real radiation would not be stopped. The rate of cooling of suns and planets surrounded by a gaseous atmosphere held to them by gravity, while space is absolutely empty of matter, must be an enormously complicated question, the solution of which is, at present at all events, quite beyond the powers of the mathematician.

The Weehawken tunnel of the West Shore Railroad (in New Jersey), which is 4200 feet in length, has been fitted with a novel block-signal system, described in the *Engineering Magazine*, consisting of a line of incandescent electric lamps about 300 feet apart and placed on a level with the eye of the engine driver. When the lamps are all alight it is an indication of safety; each train passing through extinguishes the lamps for a distance of 1100 feet in its rear, a result which is automatically effected by an electrically connected track circuit, whereby the lamps are kept under the continuous control of the train. The operators in the signal towers at each end of the tunnel can also extinguish the lights in any section of the tunnel if occasion requires. This system appears to embody a number of exceedingly valuable features, and, if successful in practice, cannot but increase the traffic capacity of a long tunnel largely beyond that which is possible by the methods of signaling heretofore in use.

One of the largest steamboats in the world was launched on Thursday, August 10, at the shipyard of the Delaware River Iron Ship Building & Engine Company, formerly the John Roach shipyard, at Chester, Pa. The vessel has been built for the Fall River Line and is named the "Priscilla." The boat, which is larger than the well-known "Puritan," is 424 feet on the water-line and 440 feet over all. Her width is 52 feet 6 inches, draft 12 feet 6 inches, and total displacement about 4550 tons, with cargo capacity of 800 tons and passenger capacity of 1400. The hull of the vessel is built of steel, with 52 water-tight compartments, and she will be furnished with double inclined compound engines, with 8500 indicated horse-power. The design of the "Priscilla" is due to George Pierce, supervisor of the Fall River Line, and the engines were designed by Andrew Fletcher of the North River Iron Works, Hoboken. The vessel will receive her engines and be finished in New York.

According to a recent statistician the United States produces 2220 pounds of grain to each inhabitant; Denmark, 2205; Canada, 1500; Russia, 1200; Roumania, 1150; Spain, 1100; France, 990; Sweden, 980; Argentine Republic, 750; Australia, 760; Germany, 700; Belgium, 600; Portugal, 550; Ireland, 500; Scotland, 490; England, 360.

The following table gives the total value of exports of leading domestic products from the United States for two years to June 30:

	1892.	1893.
Cotton, raw	$258,461,241	$188,766,274
Breadstuffs	249,363,117	199,034,203
Meat and dairy products	140,362,159	137,031,669
Cattle, sheep and hogs	35,624,281	26,541,801
Mineral oils	44,805,992	42,077,770
All other articles	237,115,221	237,339,013
Total	$1,015,732,011	$830,790,730

Cargoes of all descriptions are unusually scarce on the lakes and there is general mention of vessels laying up till better times.

Impending war in the wall-paper trade is rumored on account of the alleged efforts of the National Wall Paper Company to boycott the manufacturers who do not work with that combination. The company are said to control 80 per cent. of the entire output of the United States, and it is claimed that they have secured almost the whole trade of the country by offering premiums to such jobbers and retailers as purchase their supplies exclusively. The 20 per cent. of outsiders are now combining to fight the consolidated corporation.

Rice cultivation is strongly recommended by the Agricultural Department in certain sections of the South, particularly in Southwest Louisiana, where there are hundreds of thousands of acres lying idle which are admirably adapted for raising this cereal. As rice forms the staple food of more than two-thirds of the human race a market for all that can be grown will never be wanting.

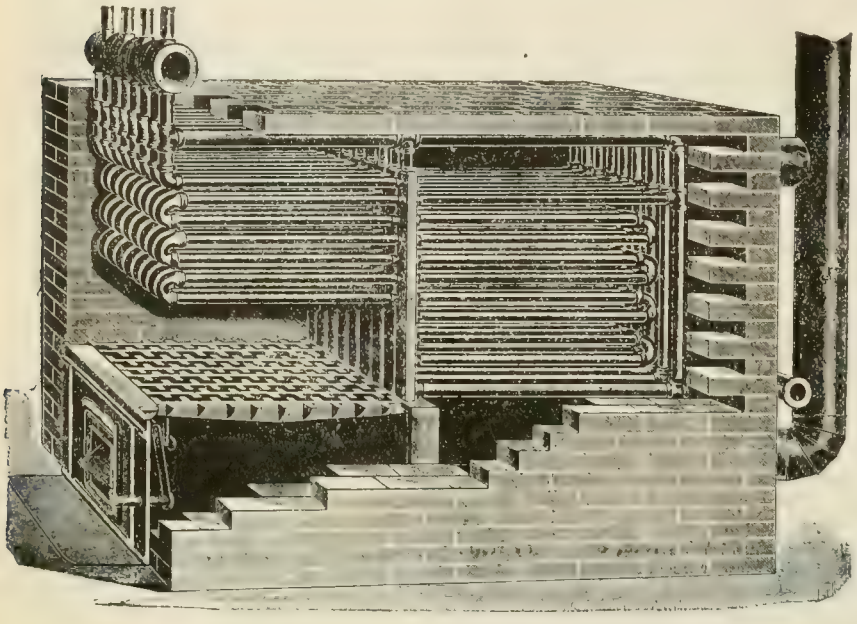
The August Government crop report for the United States shows a decline in the condition of nearly all agricultural productions except hay, due mainly to the drought which has prevailed in most parts of the country.

Western farmers are anxious to ship their hay for export to Europe, but as they want fancy prices for it, shippers will not take hold. No domestic hay has consequently been exported yet, although Canada is sending her's abroad in great quantities through the New York bonded warehouses.

STEAM AND HOT WATER.

The Electric Heating Boiler.

We print herewith illustrations of the Electric heating boiler manufactured by the Electric Boiler Company of Rochester, N. Y. The boiler is made for both steam and hot-water heating, the annexed illustrations showing the boiler as adapted to steam, the construction, however, being closely similar to the form they employ for hot water. Fig. 1 is a view of the boiler with the brick setting broken away at the side, showing the arrangement of the sections and their position in relation to the fire. This boiler is finished with cast-iron front and the usual trimmings of steam gauge, water glass, damper regulator, &c. Fig. 2 is a side view of a single section with the waterways broken, showing the relation of the steam and water spaces, and also by means of the arrows indicating the course of the products of combustion. Referring to Fig. 2, it will be seen that the sections consist, first, of a heavy iron stand pipe, N, into which wrought-steel tubes are screwed with right and left hand threads, and with return bends, *b*, at the opposite ends. The bends are so arranged that they bring the top pipe of one pair opposite the bottom pipe of the opposite pair in such a manner, it is explained, as to secure to some extent a continuous circulation of water. Each stand pipe with its complement of tubes forms a section. From the bottom of the rear side of the stand pipe a tube, *cc*, extends to without the brick setting, where it connects with a flanged tee or cross, the tees and crosses being bolted together, forming a header, R, to which the return pipes are connected. The top tubes front and rear are carried up and connected with an eduction pipe, B B, as is likewise a tube from the top end of the stand pipe. These eduction pipes, as they are called, form the top of the combustion chamber. They extend out through the top of the boiler covering near the front end, where they are connected with the flanged tees that are bolted together, forming a flow header, *s*, from which the flow pipes are run. By this arrangement of sections it is pointed out that each section is practically a separate boiler with its own circulation. By varying the lengths of the tubes and the number of sections boilers of various sizes can be furnished. It is pointed out, furthermore, that this system of connecting renders it easy to repair the boiler. The tubes are arranged in a partially staggered form so as to present the greatest surface to the action of the heat and at the same time to produce as little friction as possible in the smoke passages. The products of combustion rise through the vertical rows of staggered tubes on the front of the stand pipes, as shown in Fig. 2, pass over between the top ends of the stand pipes and the eduction pipes and between the short tubes connecting the two; then into the rear combustion chamber and down through the tubes to the smoke pipe, leaving the boiler where the water is coolest. The smallest boiler consists of four sections, has a grate surface 12 x 12 inches, a heating surface of 28 square feet and a capacity with hot water of 200 square feet, and with steam of 160 square feet. In these boilers there are ¾-inch tubes 12 inches long at the front and rear of stand pipes. A similar set is made with tubes of the same size 15 inches long, 18 inches long, 21 inches long and 24 inches long. They are likewise made of 1 inch tubes 30 inches long, front and rear of stand pipes, 36 inches and 42 inches; 1¼-inch tubes 36 inches long, front and rear of stand pipes, 42 inches, 60 inches and 70 inches; 1½-inch tubes 48 inches long, front and rear of stand pipes, 60 inches, 72 inches, 84 inches and 96 inches. From the above particulars it will appear that a very extensive variety of sizes is furnished of the Electric boiler.



The Electric Boiler.—Fig. 1.—View of the Boiler with Setting Partly Removed.

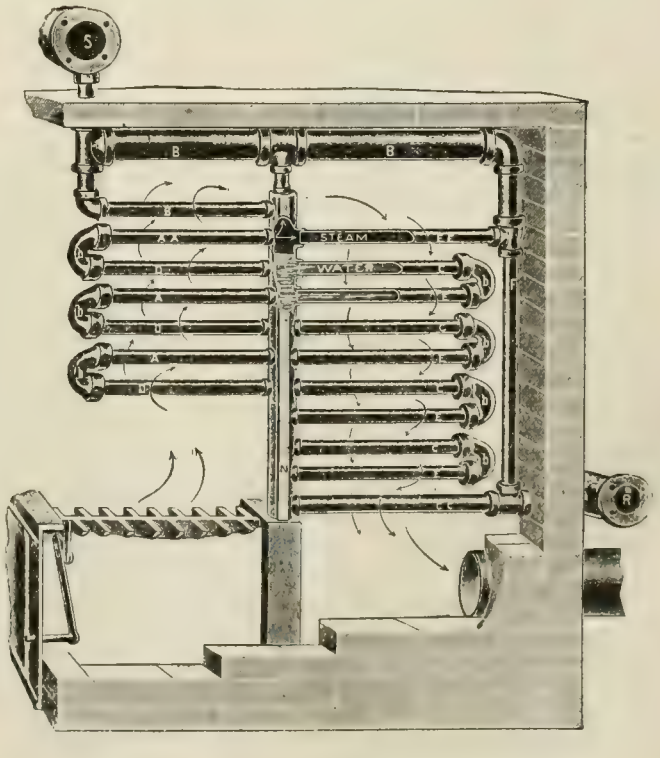
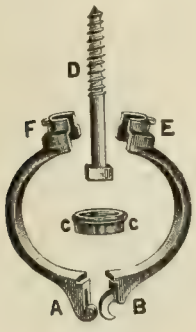


Fig. 2.—Side View of Single Section of Boiler.

O. K. Pipe Hanger.

Patents are being secured by T. B. Cryer & Co., Newark, N. J., for the O. K. pipe hanger, which is shown open for use in Fig. 1 and closed as in use in Fig. 2. It consists of a gimlet-pointed square-headed lag screw, two pipe clamps and a yoke for the clamps. It



O. K. Pipe Hanger.—Fig. 1.—Hanger Open.

permits of all the lag screws necessary for a line of pipe being screwed in position and the pipe being propped under them; then the clamps can be placed around the pipe and over the head of the lag screw, to be secured by the yoke. Then a pipe wrench can be used on the lag screw, turning it to raise or

Fig. 2.—Hanger Closed.

lower the pipe till it is in proper line. The hanger is made in sizes for pipe from ¾ to 10 inch, and the lag screws are furnished 4, 6, 9 and 12 inches long.

HEATING NOTES.

At a meeting for discussing the rebuilding of the Tremont Temple, at Boston, this fall, it was announced that arrangements would be made for ventilation on an improved plan, furnishing 50 cubic feet of air per minute for each person.

A neat circular, with the trademark of the Royal heating apparatus at the top, comes from Hart & Crouse, Utica, N. Y., announcing that they have retained W. M. Mackay, who will have entire charge of their steam and hot-water department, with headquarters at 236 Water street, New York.

The March-Brownback Stove Company, Pittston, Pa., issue an attractive illustrated circular respecting the Crown steam heater. The publication is of oblong size and is neatly bound in paper, with title and other information on the front cover in black and red inks. There are but eight pages in the circular, which, however, are sufficient by means of text and illustration to explain the chief features of this steam-heating apparatus. A general view of the boiler is shown, likewise a view of the grate. Then come sectional and other views, together with which are full descriptive particulars. One page is given up to a table of dimensions and prices, the boiler being made in five sizes with diameter of fire pot from 18 to 30 inches and adapted to heat from 275 to 1200 square feet of radiating surface. In addition to the description furnished some other serviceable information is presented. Along with the pamphlet is an estimate blank that will be useful to those who wish estimates furnished on heating houses.

The Holland Radiator Company, 89 Lake street, Chicago, are to double the capacity of their works at Bremen, Ind. Among the improvements is a new addition, 68 x 58 feet, to be used as a molding room, in which will be placed a large cupola having a capacity of 6 tons of iron per hour. This, in connection with the cupola in use, will give a total capacity of 12 tons per hour. A fire-proof building 40 x 26 feet is to be erected that will be used entirely for core making. The present capacity of the works is 300 radiator loops per day, and as soon as the improvements are made additional men will be put to work, and 600 loops will be the daily product. The company state that large contracts for radiators have been taken in New York, Boston, Chicago and Sweden.

Frank B. Dyche has been appointed receiver for the Rice & Whitacre Mfg. Company, manufacturers of engines, boilers and steam and hot-water appliances at 47 South Canal street, Chicago. The application was made by Emma L. S. Rice, one of several in whose favor the company confessed judgments on the 8th inst., for amounts aggregating $14,275. The company were organized with a capital stock of $60,000 and claim present assets approximating this amount. No estimate is made of the liabilities beyond the general admissions of the concern's inability to meet their obligations.

Burmese Tin Mines.

In the *China Review* E. H. Parker gives an interesting account of the tin mines of the Maliwun Peninsula, in the extreme south of Burmah. Victoria Point, he says, is the southernmost extremity of the Indian Empire in this direction. The Pakchan River is for 50 miles or so the boundry between the British possessions and Siam. The population of the peninsular tract is entirely Siamese, Malay and Chinese, and Burmese is as little spoken as Burmese faces are rarely seen. A pathway has recently been made from Victoria Point up to Maliwun, which is the chief center of the tin-producing industry, and this pathway also runs north of Maliwun to the highest point of sea-going steaming navigation; but, with the exception of this path, the country is one dense mass of mangrove swamp and impenetrable jungle, the haunt of rhinoceros, elephants, bison, wild cattle, sambur, tapirs, tigers, leopards, and other wild animals. On the opposite side of the river is Renong, a Siamese province under the rule of a Chinese rajah, whose intelligent government has changed the country from a mangrove swamp into a nutmeg garden and a tin-manufacturing center. The Pakchan River is very pretty; densely-wooded hills in the distance on all sides from a very agreeable background to the tangled masses of virgin mangroves. The steamer enters a tributary called the Maligun River to the left, but 17 miles from the mouth, and anchors a mile or two below Maliwun creek, the haunt of alligators. Maliwun is a thriving village of perhaps 50 houses, mostly Chinese. There are two tin-smelting houses, where during the smelting season 7 hundredweight of tin can be smelted in a day by each furnace with four or five men. The total annual production of clean tin at present is about 50 tons a year. The smelting apparatus is extremely simple, and is like that used by the miners of Perak. A mud furnace, just like a wine barrel, bound round and crossed with iron hoops, with a bellows consisting of a hollow tree fitted with a piston and connected with the furnace by a short bamboo tube let into a mud tunnel, is all. The whole only costs about $25 when new. One man drags the piston to and fro, but as this is hard work he has to be relieved every hour or two. Another man does the stoking, putting in the charcoal, tin, and slag for resmelting at the top. Out of a small hole in the bottom, on the side opposite the hole connected with the bellows, runs the tin, which is allowed to collect in a hole in the ground, and is then shoveled into two molded holes in the sand, made by working a wooden mold, like a huge brick rounded on one side, into the sandy soil. Nothing could exceed the extreme simplicity and economy of the whole arrangements, and hitherto no foreign machinery has ever been able to cope with them for a moment in an economical sense. The chief smelter is a Malay-Burmese widow, who, after refusing several eligible suitors, including one or two Europeans, has at last bestowed her hand upon an industrious Chinese. Another enterprising Siamese widow owns the spirit license, and after long reflection is about to bestow her hand upon a second respectable Chinese. In Burmah the women do nearly all the trade, and Burmese influence has thus affected these Siamese and Malay born ladies. There is a stream of beautifully clear, fresh water running through the town. The Chinese population of Maliwun, including the mining villages up country, is about 120. All seem to live together in a very friendly way; there is very little crime, and not much trouble in connection with the opium and gambling laws. At Maliwun there is a police station with eight Goorkhas, and a tumble down courthouse. A walk of 2 miles through a very pretty country brings one to the first tin washing. It is alluvial, and the Chinese simply dig away the superficial soil, and throw the under part laden with tin into a series of wooden sluice boxes, sometimes with a ledge at the bottom; the tin sinks, while the lighter portions are carried away. Very little tin is lost, as rakers or scrapers are employed to keep the tin up, and those fragments which escape the first are certain to sink before they reach the last sluice box. The path from this mine to the second and third is rough. Parts of it are always under water, much of it lies over jungly hills, and all of it is slippery in wet weather. The leeches, too, are very persistent and have to be picked off at every stoppage. After a leech bite the blood does not stop flowing, but forms a huge clot on one's clothes, and it is said to be better not to stop the bleeding so as to "let the poison run out." At the second mine there is an old Chinese patriarch. He is 75 years of age, and has been 40 years in the country, smoking opium steadily all the time. He keeps a drug shop, and seems to be very much respected in the neighborhood.

WORLD'S FAIR NOTES.

The Ferracute Machine Company,

of Bridgeton, N. J., have a large exhibit of their presses, spinning lathes, and other sheet-metal machinery, as well as a number of dies, at the Columbian Exposition. They are located in the center of Machinery Hall Annex, columns I, J, 42. Their space is about 30 feet square, and they have a small auxiliary space on the center aisle also. They show two large drawing presses, a large double-crank press, three of their new style of C presses, two punching presses and a number of foot, screw and drop presses, two spinning lathes, beaders, threaders, crimpers, &c., in operation daily. They are manufacturing a number of small goods in aluminum, brass and tin, thus illustrating the working of the presses to the best advantage. All of these presses are from their latest designs and with a number of improvements in the way of new clutches and adjustments, convenient clamping arrangement for setting dies, &c. Their exhibit is driven from a line of shafting of their own, and an independent upright engine gives them their motive power.

There are a number of dies in operation which are of special interest to the sheet-metal trade, in the manufacture of cups, plates, pans and small fancy goods. They also show one of their embossing presses and one of their coining presses, which are adapted for medals, badges and fancy work of various kinds. They also show on their wall space a great variety of articles in sheet metals which have been manufactured in their presses and dies. Among these may be specially noted sheet-metal shingles in numerous patterns and shapes, a variety of vessels showing deep drawing and stamping, cans of many sizes, fancy metal boxes, sheet-metal ornaments, &c. Towering above the exhibit is a revolving vertical shaft, on which are two great signs at a right angle with each other, bearing the name of the company and attracting attention to the display.

They have a neat office fitted up in connection with their space, and will be glad to welcome any one in the metal-working trades at any time. Mr. Hoffman, foreman of the press department, is in charge of their exhibit, and Mr. Stevenson is in charge of the dies, running presses and manufacturing the sheet-metal goods. Their whole exhibit is a very interesting one. They are about to issue a new catalogue describing their new lines of presses.

The Peck, Stow & Wilcox Company,

27 Chambers street, New York, whose factories are at Southington, Plantsville and East Berlin, Conn., and at Cleveland, Ohio, make a fine exhibit of tinners' machines and tools in Machinery Hall, column A 51. The machinery shown comprises an 8-foot square shear for foot power, a 31-inch square shear for foot power with automatic clamp and double-edge blades, a machine for cutting and folding tin or sheet metal for map binding, a 3-inch roll former with slip roll and duplex compensating gearing, a 2 inch slip roll former with compensating gearing and quick roll adjustment, a beader, 30-inch groover, rim machine, stake holder with stakes, incased machines, Columbian machines, 20-inch folder with quick-moving gauge, 30-inch folder with square box attachment, bench scroll or slitting shear, right and left hand ratchet drill, and flat and round nose and side cutting pliers. They also show the Little Giant and Triumph meat cutters. The small tools are shown attached to benches of hard wood, in position for operating. A large showcase contains fine specimens of small tools of the company's manufacture, comprising ratchet bit braces, pipe pliers in a variety of sizes, an assortment of pincers, auger bits, draw knives, bevel-sided chisels, wire pliers, compasses in great variety, hatchets, tinners' and other hammers, and Robinson's wrenches in all sizes.

Ellwood Ivins Tube Works,

528 North Tenth street, Philadelphia. These are seamless tubes, made of various kinds of metal, such as steel, brass, copper, German silver, aluminum, aluminum bronze, &c. The sizes shown run from 2 inches down to almost the diameter of a hair; but the statement is made that larger sizes can be furnished as desired, and of any commercial metals. All are made without solder, seam or weld. A peculiarity of the process is that the walls of the tube can be made of any thickness desired, so that the tubes will be heavy with small calibers or very light with merely walls of shell. They are guaranteed true and accurate, even the smallest sizes being made accurate to the thousandth of an inch. The exhibit is a remarkable one and worthy of a more conspicuous position. No description of the process employed is given in connection with the samples shown.

The Kilbourne & Jacobs Mfg. Company

of Columbus, Ohio, have two exhibits, one being composed of trucks, wheelbarrows, &c., in Transportation Building, section A–12, and the other being devoted to wrought-steel sinks, in the Manufactures Building, section N, block 4. The exhibit in the Transportation Building consists of a large variety of warehouse and store trucks, barrel trucks, cotton trucks, and baggage trucks, to meet any requirement, the warehouse and store trucks being of different patterns to conform to the peculiarities of the trade in different cities; box trucks, consisting of a heavy frame on casters, for moving boxes and other bulky freight; the Little Giant truck, for handling light packages; stove carriers, which can either be used as trucks or for carrying stoves from one location to another; book and paper house trucks, wire-nail wagons, bar-iron trucks, sheet-metal trucks, machine-shop wagons, and a great number of special trucks for a variety of purposes. There are also hand carts, with and without springs, in numerous styles. The Boss solid steel drag scraper and the Columbus steel ditching scraper are among other products displayed, as well as wheel scrapers. Very heavy contractors' plows are shown, while the line of wheelbarrows exhibited comprises an unusual variety of these useful articles, adapted to about every form of work to which a wheelbarrow can be put, including charging barrows for blast furnaces. The exhibit in the Manufactures Building shows the Columbus wrought-steel sink, enameled in different colors. It is also furnished galvanized or painted. These sinks are each made from one plate of steel, pressed into the proper shape, and are thus not only seamless but are very light, strong and durable, as they will not break in shipping or handling, nor from exposure to sudden heat or cold. The bowl and projecting thimble are stamped in one piece from the same plate, enabling the strainer and pipe to be satisfactorily attached. The company have their own coupling to connect the pipe to the sink, which is not only simple but is stated to be thoroughly reliable, avoiding all leakage.

Randolph & Clowes

of Waterbury, Conn., having branch offices in New York, Philadelphia, Boston, Cincinnati and Chicago, have two exhibits. One in Manufactures Building, section N–62, is devoted to Brown & Bros. patent seamless drawn copper range boilers, of which this firm are sole manufacturers. These boilers are shown mounted on boiler stands, and are beautifully finished, being polished until they look like gold. One of the boilers has been cut in two, vertically, to show the interior construction as well as the uniformity in thickness of the shell. A spiral rib runs round the interior of these boilers their entire length, stiffening the shells and supporting them so that the firm guarantee that they will not collapse. Some of the boilers are nickel plated. The exhibit is a fine one, rendered more attractive by the well-finished hard wood floor and the elegant brass railing inclosing the space. The exhibit in the Mines and Mining Building is in the east central section, and is one of the most unique and conspicuous exhibits in the building. They have built a pavilion some 25 feet square and 16 feet high with walls composed wholly of seamless tubing of different diameters running from large tubes on the corners to small ones in the centers. These tubes are of copper, bronze and brass, arranged regularly in that order, making an alternation of colors. On the top of each corner is a dynamite shell, such as were made for the "Vesuvius," dynamite cruiser. Ornamental panels of brazed tubing are arranged in various places about the upper part of the pavilion, also highly polished specimens of copper bottoms, sections of distillers' coils for worms, &c., attached to sheets of planished copper. Inside the pavilion is a rack composed of R. & C.'s patent beer-cooling tubes, which supports a number of spun brass and copper kettles of different sizes. On a large table extending along one side of the inclosure are shown a great variety of the firm's products in sheet brass, German silver, sheet copper, &c. Among the goods shown are brass moldings of new design, and specimens of the new R. & C. brass plumbers' ferrules, made by an entirely new process, to take the place of the old cast ferrule and thus save plumbers much time and labor. They are made perfectly smooth, exact to size, and are carefully tested by hydraulic pressure to 500 pounds to the square inch. Some are plain and others have the ends tinned ready for instant use. The space about the pavilion is inclosed by brass chains attached to posts composed of dynamite shells set on end. The brass signs used on these exhibits are unusually wide specimens of sign brass, being 42 inches wide.

Negotiations are going on between the governments of Great Britain and the United States for the establishment of an international system of removing the floating wrecks which are a menace to transatlantic navigation. It is proposed that the two governments should each detach two vessels for the purpose of clearing the ocean track of such derelicts.

THE RETAIL STORE.

The Security Dust Pan.

The National Handy Article Company, Louis and Campan streets, Grand Rapids, Mich., are manufacturing a new dust pan, which is herewith illustrated, Fig. 1 showing it ready for use. It has a long handle, enabling the user to sweep up all dust while standing. It is so constructed that a slight pressure on the handle will make a close contact on the floor, and the bail is so attached that when raising the handle the pan tips up in front, the sweepings

Fig. 1.—Security Dust Pan.

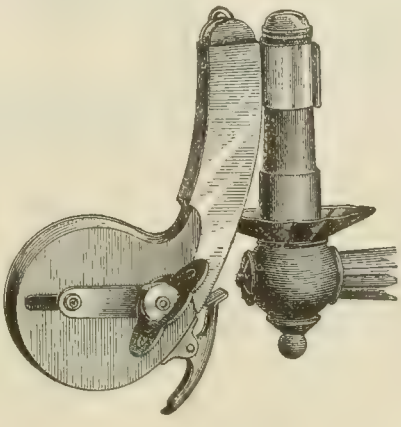
dropping down into the inclosed back, securing the dust from spilling or blowing away. It is described as obviating the necessity of stooping or kneeling and exerting heavy pressure to keep

Fig. 2.—In Position to Carry.

the pan tight to the floor, while trying to use the broom with the other hand, in an awkward and ineffectual manner. The point is made that the pan not only saves stooping, but provides for carrying the sweepings away without spilling them.

Magic Gas Lighter.

Magic Introduction Company, 321 Broadway, New York, are introducing the Magic gas lighter, illustrated herewith. As shown, the gas lighter is



The Magic Gas Lighter.

attached to a burner by means of clamps, which are sprung around the burner near the top. A roll of tape having a series of igniting pellets at intervals along its surface is contained in the bottom of the lighter. One end of the tape runs up and over a roller at the top of the lighter, then down, and is attached to the axle of a turn key. When the key is turned the tape is moved, bringing a pellet in contact with a steel point at the top of the burner, producing a flash of light. The light thus produced ignites the gas, it having been turned on before the key was turned. When the pellets on the tape are exhausted another tape may be introduced into the lighter.

The point is made by the manufacturers that the lighting is done without the use of matches or electricity, and with no danger of burning carpets with match ends; also, that the gas may be turned off when leaving the room and instantly lighted when returning. The lighter is recommended particularly for bedrooms, dark halls and bathrooms. The entire length of the lighter is less than 3 inches, and the goods are neatly finished in nickel plate.

The Perfect Scraper or Cleaner.

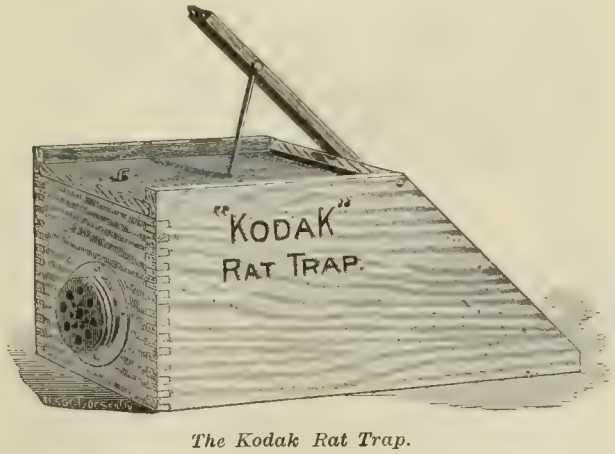
The accompanying cut represents the above article, put upon the market by Corbin & Co., Owego, N. Y. The scraper or cleaner consists of a piece of sheet steel of different angles and curves, conforming to the shapes of the articles to be scraped or cleaned. This revolves in a metal handle; thus the edge desirable to use can be instantly applied. The scraper is fastened to the handle by an open rivet, by which it can be hung up. The scraper is designed to remove burnt, incrusted food or other substances from cooking utensils of iron,

The Perfect Scraper or Cleaner.

tin, porcelain, earthenware or wood, and is also recommended for removing dough from bread boards, paint from window glass, old varnish from wood, &c. The point is made that its use avoids the danger of cutting arms, hands or wrists, as often occurs when using knives.

The Kodak Rat Trap.

The accompanying cut illustrates a rat trap put on the market by Waddel Wooden Ware Works, Greenfield, Ohio. The trap is described as being made of sugar tree wood, without any springs,



The Kodak Rat Trap.

about 10 inches long, 5 inches high, weighing 1½ pounds. The perforated screw cap is designed to serve several purposes. It may be removed to bait the trap; it gives the rat an opportunity of smelling the bait through the cap; the rat being lured into the trap attempts to get out where daylight is seen through the perforations. To set the trap the upright attached to the gate is pressed down and the trigger engaged with a

staple in the end of the upright. It is remarked that by a simple device the gate when thrown is automatically locked. The points of excellence claimed for the trap by the manufacturers are its simplicity of construction, ease in setting, lightness on the trigger, light weight and compact size.

The Self-Heating Washer.

The Self-Heating Washing Machine Company, Evansville, Ind., are introducing the above article, as herewith shown. The washer is described as having the working parts made of oak, the box of hard maple and galvanized iron. The water is put into the washer,

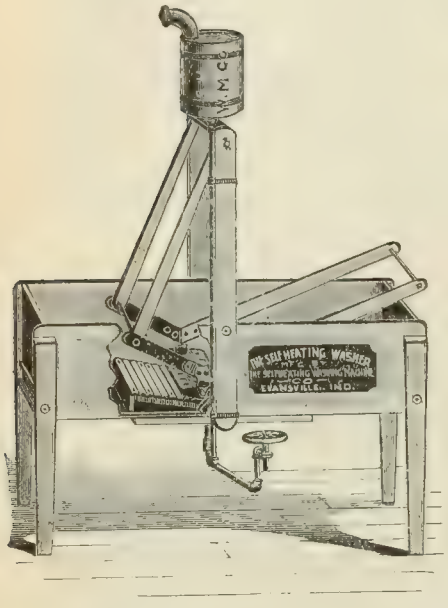


Fig. 1.—The Self-Heating Washer.

where the gasoline burner heats it, and keeps it hot as long as desired. The interior construction is shown in Fig. 1, which, it is remarked, is on the washboard principle, and rubs the dirt out. In operation the clothes are moved over the rollers in the roller bed by the rub board, the latter having holes in it, to

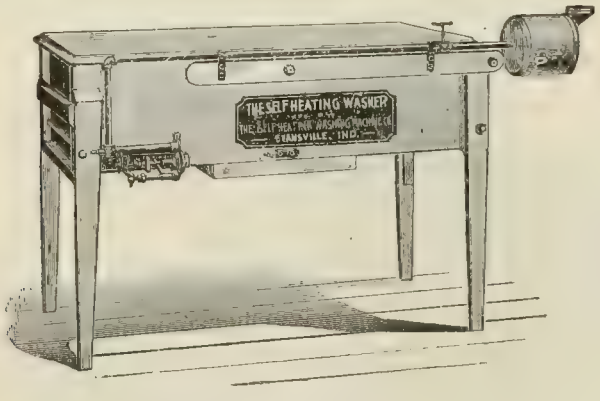
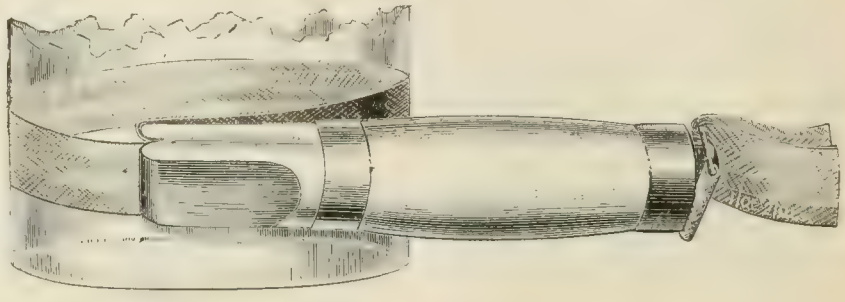


Fig. 2.—The Washer Closed.

cause the suction to force the hot suds through the garments; this, together with the rubbing, to remove all dirt and streaks. It is pointed out by the manufacturers that the operator can stand erect while using the washer; that a child ten years old can operate it; that it saves lifting clothes on and off a hot stove to boil them; that it obviates the necessity of boiler, tubs, and washboards; that the machine has no geared wheels to be oiled; that the bottom will not shrink and leak in dry weather, and that the washer can be used to rinse clothes in. The burner can be swung to one side and used for making starch, heating irons, &c.

Preserve-Jar Holder.

Francis H. Loss, Jr., 33 Murray street, New York, is introducing the above device, as herewith illustrated.



Preserve-Jar Holder.

A band of strong web material passes through the center of the wooden handle, with an adjustable tongueless buckle at the end of the handle to hold the band, when adjusted to fit various sized jars. The band is marked to indicate where to place the center of the buckle to hold either pint, quart or 2-quart jars. The manufacturers claim that by using the holder all danger is avoided of injury to the hand by jars breaking or of burning the hand when putting up preserves; also that jars can be easily opened, however long a time they may have been closed.

FREDERICK HARDWARE COMPANY, 320 and 322 State street, Beloit, Wis, successors to Frederick & Beach, have until recently been enjoying a very active business, which has followed the remodeling of their store which they bought this spring. Their present quarters are an old hardware stand in the center of the city and were built for the business. The building is some 200 by 30 feet, of stone and brick, with brick division walls and sheet iron doors connecting them. The first 75 feet is used for salesroom, with hardware, tools, &c., on one side, and tinware, forks and farming tools on the other, with stoves, refrigerators and all large bulky goods on the floor in rows, or arranged so as to be most convenient. In the next 30 feet are kept oils, rope, barn-door track, anvils, whiffletrees and goods of that class. The next 40 feet is used for tin shop, and the remainder of the store for the stock of nails, barb wire, washing machines and heavy goods and goods of large bulk. The second floor is for surplus stock of stoves out of season, &c.

Six Months' Bank Failures.—*Bradstreet's* has made a compilation covering the first six months of the current year concerning bank failures. The record given shows that 43 national banks suspended payments permanently or temporarily during the first half of this year, owing, as nearly as has been ascertained, about $23,106,000, and reporting $23,429,000 in assets. The number of State banks similarly situated was 72, with $15,865,000 liabilities and $14,599,000 assets; savings banks 20, with $6,170,000 liabilities and $6,462,000 assets; loan and trust companies 4, with $12,765,000 debts and $5,850,000 assets, and 80 private banks and bankers, with liabilities amounting to $9,383,000 and assets to $8,038,000. There were also 5 mortgage loan and investment companies reported embarrassed, with $1,090,000 of debts and $420,000 assets, while 8 brokers in securities were forced to suspend, owing $1,603,000 and having assets of $692,000. The 43 embarrassed national banks, owing $23,106,000 and having assets of $23,429,000, may be contrasted with 176 State, savings and private banks and trust company banking institutions suspended, owing in the aggregate $40,741,000 and having $30,958,000 to pay with. Aggregates of debts of embarrassed State and private banks and trust companies showed excesses as compared with assets reported.

The outlook for tin mining in Tasmania is said to be very promising. An expert has been recently prospecting, who states that tin deposits exist in West Tasmania of a very rich character. One lode at West Cumberland is from 2 to 15 feet wide, and has been proved to a depth of 50 feet, extending a distance of over ½ mile. With the crudest appliances over 20 tons of metal have been obtained from this mine. In Victoria, Australia, too, the exploitation of tin deposits is being actively carried on with promising results.

The question of accepting part payments of their wages and allowing the remainder to stand to their credit on the books of their employers until the financial stringency is ended will probably be decided among the members of the American Flint Glass Workers' Union affirmatively, and it is probable that by the influence which they will be able to exert the national officers of the union will facilitate the early starting of a number of factories and the employment of thousands of men.

STOVE TRADE NOTES.

The Future of the Hot-Air Furnace.

By A. W. Glessner,

President of the Excelsior Steel Furnace Company.

THE ARCHITECT AND HIS INFLUENCE.

Some one once asked when the training of a child should begin, and the reply of the sage was: "One hundred years before the child is born." Possibly the training of an architect should begin at the remote period indicated if he is to properly fill his important position, but as that is impossible it is pleasing to note that at the present time in some of our modern universities there are classes in architecture who are giving attention not only to the construction of buildings, but also to the heating of the same by the modern systems. The interest in this branch of their work was recently shown by the class in architecture of the University of Illinois, at Champaign, by inviting one of Chicago's leading architects to address them on the subject. The lecture, an illustrated one, was received by the class with marked attention, and has been recently published and excited no little interest. While treating of all kinds of modern heating in an intelligent manner, that portion devoted to the consideration of furnace heat deserves much praise, as it is rarely that hot-air heating is so ably discussed.

Much has been written and said on hot-water and steam heating, and it is not difficult to place one's hands upon valuable data on these modes of heating, but until very recently it was next to impossible to find anything definite or practical on hot-air heating. There was much theory but few facts to be found in print, and this has had an important bearing on "The Future of the Hot-Air Furnace," for the architect, not finding anything printed in defense of the much-maligned hot-air furnace, has joined hands with the steam and water men in abusing it, and in consequence many clients who looked with favor upon furnace heat were induced to use other systems.

The influence of the architect is usually sufficient to compel the use of such appliances as he may specify, and it is but natural that the client who has placed himself in an architect's hands should follow his advice, for does not the architect know everything about building? He certainly should, according to the ideas of many clients. He should be posted upon the merits of all the different materials that enter into the construction of a building, and should be able to tell at a glance the size, weight and brand of tin plate in a furnace pipe whenever he sees it.

Contractors who do business with architects know the limitations of the knowledge of the latter, and know that with the different things on an architect's mind he cannot be an absolute master of the details of all branches of the building trades, but knowing his influence they should persistently bring the merits of hot air heating to his attention, and work for his co-operation in advancing the future of the hot-air furnace. He can do not a little to increase the sales of furnaces, and would advocate hot-air heating did he know its advantages in many cases over any other system in use.

(*To be continued.*)

Pennsylvania Pie.

BY L. M. W.

This is the time of year when the stove salesman is eager to visit his Pennsylvania trade in the country districts. It is possible that the reason may be found in the statement by an official of a large foundry that he once sat down to the table at a hostelry where nine kinds of pie were arranged invitingly at the guest's disposal. A very popular custom prevails of passing the pie so that each one cuts to his own measure, and the quality permits of no fears regarding digestion. The supply seems unlimited and the variety is maintained to the end. "Pie-us" jokes about "pie-eat-he" are very heavy compared with those pies and are only perpetrated by newcomers who never before reveled in unlimited pie. Disturbance of any character is never created by these pies unless some New York or Chicago salesman happens to remark in the hearing of a Pennsylvania stove distributing tourist that those pies were baked in one of their make of stoves; then "im-pie eat-he" is apt to melt the sugar on the crust.

Brand Stove Company.

We are indebted to the Brand Stove Company of Milwaukee, Wis., for a copy of a very neatly arranged and attractively bound illustrated catalogue and price-list of their leading specialties. In its general make up it conforms to the style which has become popular with the trade, and is a credit not only to the company issuing it, but also to those who are responsible for its mechanical execution. The edges of the pages are finished in a light shade of red, while the covers are stiff board, embellished with a side title in old gold. In their announcement to the trade the company state that as the steadily increasing volume of sales renders necessary the greatest possible simplicity in the designation of their enlarged assortment of manufactures, they have determined to eliminate the term "Brilliant," formerly employed as a collective name for their heaters in distinction from the name "Famous," as signifying their line of cook stoves and ranges. From this time forward their entire product, embracing cook stoves, ranges, heaters, furnaces, gas and oil cooking ranges, &c., will be known under the single term "Famous," and this general designation will be prefixed to the individual name of each stove. The goods shown cover a wide range, and embrace constructions well known to the trade and embodying features which render them satisfactory in operation. The opening pages are given up to ranges, which are known under such names as Famous Edison, Famous Goldbrand, Famous Model, Famous Crescent, Famous Chief and Famous Gold Dust, the latter being intended for burning wood only. The cook stoves include the Famous Crescent, the Famous Chief, the Famous Puck, the Famous Brand, the Famous Gold Dust, the Famous Columbian and the Famous Pickwick. A line of hotel cook stoves is offered under the name Famous Grand, this being a new construction intended for burning wood as a fuel. The heaters occupy the closing pages of the catalogue, and are creditably represented by the Famous Aurora in the place of honor. This is a first-class heater, of rich ornamentation, and is intended for burning hard coal only. It is shown in the catalogue with and without oven attachment. The Famous Art for 1893, another square parlor heater; the Famous Brand Brilliant, a first-class medium-priced heater which has been improved for this season's trade; the Famous Star, a three flue surface burner remodeled for 1893; the Famous Oak, a new heater for soft coal or wood, made in several sizes; the Famous Jewel, a low-priced all cast cottage parlor stove, for wood or coal; and the Famous Sun, a medium-priced construction of the same class, together with a varied selection of cylinder, box and laundry stoves, make up the assortment. Attention is also invited to the line of Famous gas stoves, which have been improved for 1893. A list of hollow ware and a comprehensive index are features of the closing pages of the catalogue.

Furnace Heating and Electric Fans.

The furnaceman will be interested in the following letter from Oscar Weiderhold, with L. J. Wing & Co., 126 Liberty street, New York, giving experience with the use of disk fans and electric motors in connection with hot-air furnaces:

The past winter, which was a very severe one, proved that the heating apparatus was deficient in many buildings, such as schools, churches, apartment houses and large residences. As in most of such buildings the heat passes through flues to the different rooms, a disk fan can be placed at or near the furnace or source of heat supply and the heating capacity doubled. It is a well known fact that when the wind pressure is opposite to that side of the room where the furnace flue is situated, the current of warm air is actually prevented from entering the room. By the use of the fan this is obviated, as the fan forces the air through the flues to the different apartments or rooms to be heated. The cold air is taken from the outside of buildings and passed over the furnace or among steam pipes, as the case may be, thus ventilating as well as heating the rooms.

In the summer when the heat is not required this system can be used to great advantage for ventilating, without any alteration whatever, public schools and churches, by forced currents. It is a noticeable fact that people are often seen in public assemblies yawning and giving other evidences of being tired and sleepy, which is mostly due to improper ventilation. As electricity is in such wide use, electric motors can be and are employed as the medium of power to drive fans. They require very little power. An 18-inch fan moving 3000 cubic feet of air per minute will take only ⅛ horse-power. As these fans need only to be set in motion when the rooms are occupied, such as churches and public schools, it will be a very economical system to what it would cost to double the heating apparatus, and considering the many advantages this system has, it will soon be appreciated for the healthful air which it provides. When more information makes heating and ventilating by this system better known, its advantages will be appreciated and its use increase.

Cribben, Sexton & Co.

"Universal Stoves and Ranges" is the title of a volume of nearly 160 pages which reaches us from Cribben, Sexton & Co. of Chicago, Ill. It is in the nature of a descriptive catalogue and price-list of the goods named, and presents in connection therewith a great deal of information which is interesting and valuable to dealers handling high-grade stoves. The opening pages are devoted to a bird's-eye view of the company's works, the front elevation of their office and salesroom in Chicago, and general views of their agencies in San Francisco, Cal., and Portland, Ore. The company state that they have made arrangements with the Harper & Reynolds Company, in Los Angeles, Cal., to supply the trade in that section, and for the accommodation of the trade tributary to Salt Lake City a large stock of Universal stoves and ranges will be carried by Charles Wanless & Co., Salt Lake City, Utah. Nearly 60 pages of the catalogue are given up to ranges of attractive dress and modern construction made under such names as Regal Universal, Peerless Universal, Welcome Universal, Superb Universal, Novel Universal, Famous Universal, Apollo Universal and Prize, all being intended for burning coal or wood, and the Pacific Universal, Mystic Universal and the Victor Universal for burning wood only. The cook stoves occupy something over 30 pages of the catalogue, and are offered in sufficient variety to meet all reasonable requirements of the trade. These are also made under the generic name Universal, with such prefixes as Sterling, Family, Prize, Majestic, Premium and Elegant. The heaters occupy the latter half of the volume and are represented by the Radiant Universal in the place of honor. This is a new high-grade heater for hard coal, and embodies among other features extra heavy fire pot, large bailed ash pan, patent automatic swing covers, permanent hot-water attachment, reflector top section, double heating attachment and nickel trimmings. The manufacturers refer to this stove as "the most elaborate production of the age and an embodiment of all details known to modern stove manufacturing science." The Jewel Universal is a richly treated surface burner and is said to include in its construction many specialties not found in other stoves of its class. A varied assortment of cottage parlor, sheet-iron cylinder, globe, cannon, laundry, oak, Todd and box stoves are presented, together with price-lists of hollow ware and miscellaneous goods. Sectional cuts of stoves, with the various parts numbered, are shown in connection with explanatory tables for the purpose of facilitating ordering repairs. The catalogue closes with a general and alphabetical index.

R. Robinson & Sons

of Chicago have brought out a neat catalogue of the leading goods which they handle. The 114 pages of the volume are printed in red and black, upon good paper, and are bound in colored paper covers, with side and back titles in red and old gold. The goods shown cover an extensive assortment, prominent among which are those made under the name Red Cross and turned out by the Co-operative Foundry Company of Rochester, N. Y. In addition to these, we find the Model steel range, made by the Portsmouth Stove & Range Company; the Superior Process vapor stoves, which have been improved for the season of 1893, and which are offered by Messrs. Robinson & Sons in several styles and sizes. The Novelty oil heater, with brass tank and roller base, and the Splendid, another oil heater of attractive proportions; the Bermuda hot-water heater, made in three sizes; the Hornet hot-air furnace, together with a general and alphabetical index, constitute features of the closing pages of the catalogue.

Scanlan & Co.

of Louisville, Ky., favor us with a very neat catalogue of the stoves, ranges and hollow ware they manufacture. The printing is in two colors, the edges of the pages are finished in bright red, while the binding is in flexible covers of black cloth carrying a side title in old gold. The make up is very neat and the volume is likely to be appreciated by the trade. The company state that the designs and patents illustrated and described in the catalogue are properly protected by law and that they will prosecute to the fullest extent any infringement of their rights. After a special notice to the trade relative to the company's assortment of hard wood mantels and cabinets, slate and iron mantels, &c., directions are given for operating stoves, following which the Faultless line of ranges is illustrated and described. This construction is intended for burning coal or wood and is made in four sizes. Under the same name the company offer a line of cook stoves of pleasing design and made in three sizes. The Faultless Nellie Bly, a four-hole cook stove constructed on the most improved principles; the Faultless New Woodlawn, a four-hole range for burning wood only; the Faultless New Daisy, four-hole wood cook; the Faultless Glendale, another member of this general class, and the Faultless South, a six-hole step stove for burning wood, are also considered. The heaters are represented by the Faultless Star, a very neat oak stove which the company have added to their assortment this season. This heater has double feed doors, draft slide, swing top and heavy cold-rolled steel body. The Faultless Relief, a sheet-iron cylinder stove, made in several sizes; the Faultless Spray, a cheap cannon stove; the Faultless Florence, an attractive Franklin; the Faultless Magpie, a neat box stove, and the Faultless Laundry, are some of the other goods to which the attention of the dealer is directed. The closing pages are given up to the presentation of hollow ware, stove boards, grates, iron mantels, &c.

Rock Island Stove Company.

We are indebted to the Rock Island Stove Company, Rock Island, Ill., for a copy of the catalogue which they have issued for the season of 1893, covering their leading specialties. The goods are made under the generic name Riverside, and are offered in a variety of styles and sizes. The opening pages are given up to the Riverside range, a six hole stove intended for burning hard coal or wood. The ornamentation is neat and effective, the castings strong and durable and the improvements of the latest type. Following this we find the Home Riverside, especially adapted to using the fuels of the Northwest and to meet the requirements of small families. The Ideal Riverside is another member of this general class, and is offered in three sizes. The Rock Riverside is a new medium-priced four hole range of tasteful decoration, and has rounding front and grate, patent take-out damper, sectional linings and fire box, automatic oven-door catch, corrugated oven bottom and cut top. The Home Riverside is a neat four-hole cook stove for burning soft coal or wood and is offered with all the latest features. Other cook stoves include the Ideal Riverside and the Rock Riverside, the latter being an entirely new four-hole stove for soft coal or wood. Under the name Wood Riverside the company offer a line of four and five hole ranges, which are new this season. Among the heaters we notice the Maple Riverside, a new cottage parlor stove for burning wood; the Riverside Oak, shown with and without ventiduct; and the Island City, a heavy cannon stove made in three sizes. A feature of the closing pages of the catalogue is a repair list, giving the prices of pieces usually called for. There is also given a list of pieces fitting more than one stove and a list of interchangeable wood linings, together with directions for setting up and operating stoves.

Bloomington Stove Company

of Bloomington, Ill., have just issued from the press an illustrated catalogue and price-list, in which the trade is likely to be interested, from which the company have omitted nearly all of the older patterns, although they can be furnished, together with repairs, when so desired. During the past year extensive improvements have been made in the company's line of goods, special attention being invited to the Grand Central and Central stoves and ranges. These goods are of exceedingly attractive design, and are made with those features which are essential to satisfactory operation. The Grand Central range has a large fire box, durable linings, automatic drop grate, large ash pan, draw hearth, polished steel finished edges and nickel trimmings. It is made in a variety of styles and sizes, several of which are shown in the catalogue. The Central range is a four-hole construction, moderate in price and satisfactory in operation. Under the names given above the company offer extra heavy first-class cook stoves, which have the modern improvements. Among the heaters we find the Royal Crown, hard coal base burner, made in three

sizes; the Perfect Carbon, a soft coal base burner of attractive ornamentation; the Perfect Oak, adapted for burning soft coal or wood; the Carbon, a heavy cannon stove; the Modoc, a neat Todd, and a tailor and laundry heater made in one size only. A price-list of sundries completes the catalogue.

The Leaf Stove Company.

Amid the cupids and flowers embossed on the dark-green covers of a catalogue sewed with red-silk cord appears, in silver-bronze lettering, the inscription, "The Leaf Stove Company, Phillipsburg, N. J., Manufacturers of Stoves and Ranges," while the trade-mark, consisting of a maple leaf, adorns the back cover. The announcement states: "Since we have assumed control of the Phillipsburg Stove Works, we have thoroughly reorganized and rehabilitated the plant and shall in future direct our energies toward the production of first-class goods only." This is followed by a brief statement of their intentions for the future and the terms. The Maple Leaf is a handsome range, shown by a half-tone engraving, having as prominent characteristics large sheet flues, correctly proportioned fire-box, a perfect-working duplex grate, large ash pit and a four-piece top with braced cross pieces, cut reversible long center and ribbed covers, as enumerated in the text, which states that every range is supplied with an effective device for heating an upper room without additional cost. The Holly Leaf, a new five-hole range of modern design, and the Friendship and Miner's Rescue are substantial low-hearth cooks. The Ivy Leaf leads the square parlor heaters, followed by the Paxinosa and Milo, which present the embellishment and essentials that are required by the live dealer. The J. I. C. is a globe stove, made as a single and double heater, while the Gossip is one of the smaller and popular cast-iron egg heating stoves.

ODD PLATES.

From W. B. Wilkinson, manager of the New York office of the Howard Furnace Company, Syracuse, N. Y., we receive copies of the new catalogue and other pamphlets recently issued by the company and noticed in our columns.

From Wood, Bishop & Co., Bangor, Maine, comes a pamphlet of the Monitor and Climax wood furnaces, with a letter referring to testimonials from churches that are satisfactorily heated. The letter explains that their system of placing an air grate directly over the furnace has been used in each case. The quantity of fuel consumed is an interesting feature of these testimonials to prospective buyers.

Moorwood, Sons & Co., iron founders, of Sheffield, England, have just supplied a wrought iron cooking apparatus for one of the new Atlantic liners, which is said to be a very clever piece of workmanship. The flues are all self-contained in the range, which is capable of cooking dinners for between 600 and 700 persons at one time. This firm supplied the cooking ranges for the unfortunate war vessel "Victoria."

James Campbell, formerly with the Chicago house of the Simonds Mfg. Company of New York, is at the present time disengaged and enjoying a well-earned vacation. He makes his headquarters with his brother, Robert Campbell, at 305 Pearl street, which is the New York agency of the Abram Cox Stove Company, Philadelphia.

Mehaffie & Smith, Logansport, Ind., are preparing for the fall trade by issuing a circular of the Smith patent heater and fuel economizer. The latter is a drum for attaching to a stove, and is arranged to take the air from the floor, heat it and then discharge it either into the same room or one on the floor above by means of a pipe and register.

A. Froelich, 289 Pearl street, New York, is distributing among the stove repair trade a valuable memorandum book with leaves of prepared slate and a pencil. Silver bronze on the covers show resting on an easel a sign with the words "Stove Repair Notes," and on the back is the address and a notice that he manufactures repairs for stoves, ranges and furnaces and does job casting and nickel plating.

In a recent issue of the *State*, published at Richmond, Va., a brief review is presented of the leading concerns engaged in commercial and industrial pursuits in that city. Among the number is the Richmond Stove Company, who are referred to as being the largest and oldest stove foundry in the South. They were organized over 20 years ago and possess a well-equipped plant, covering more than half a block. Nearly 100 hands are employed and several salesmen are kept constantly on the road in the interests of the company. The business of the concern has grown to such proportions that they have recently been compelled to add to their already extensive plant a three-story brick building, 46 x 80 feet in size. This is intended for office and warehouse purposes and will be fitted up in keeping with the rest of their plant. The business of the company is under the direct supervision of W. J. Anderson, the president, and R. G. Reynolds, the secretary and treasurer.

Charles E. Clark, of 231–247 Newberry avenue, Chicago, has issued his annual catalogue covering the line of goods handled. It is a volume of something over 100 pages, bound in colored paper covers, and the goods shown include leading specialties of many of the principal stove manufacturers of the country, more particularly those of Eastern foundries. Prominent among the stoves we notice the Radiant Home range and parlor heater, the Wren, New Jacket and Palos, 5-hole ranges; the Niagara, Model Garnet, Crown Bay State and Art Bay State ranges; Born's steel plate French range; the Royal steel range; the India, round base burner; the Hub, oval parlor heater; the Crown Hub, square hard coal base heater; the True American; the Magic Columbia; the Garnet parlor, and many others. The fourth page of the cover is devoted to a general view of the office and warehouse of Mr. Clark.

We are indebted to the Kernan Furnace Company of Utica, N. Y., and Chicago, Ill., for copies of pamphlets of pocket size relating to their leading lines of furnaces. The printing is neatly executed in two colors, while the binding in paper is tasteful and appropriate. Attention is invited to the Kernan, made in four sizes, portable form and for brick work; the Kernan Union in five sizes, and the Cauldron Furnace. These goods are carefully illustrated and described, while more than half of one of the pamphlets is taken up with the names of some of those who have used the heaters made by the company. A second pamphlet tells all about the merits of the Kernan smoke consumer, which is made in four sizes and intended for soft coal, while a third volume contains among other things a telegraphic code and numbers designating all parts used in the construction of the Kernan furnaces.

Fuller & Warren Warming & Ventilating Company, 43 Milk street, Boston, Mass., issue a circular addressed to the users of the Fuller & Warren cremating closets and the other customers of the company, in which they recite the particulars concerning the suits between themselves and the Smead Warming & Ventilating Company. The statement of the Fuller & Warren Warming & Ventilating Company respecting the protection of their customers will be read with interest.

The March-Brownback Stove Company of Pottstown, Pa., are distributing circulars calling attention to some of their leading goods. Among these we notice the Golden Crown, a new revertible flue parlor stove which may be used as a single or double heater; the Welcome Globe range, a new six-hole construction for burning hard coal, soft coal or wood, and the Crown furnace, which is made in four sizes, with fire pots measuring respectively 18, 20, 22 and 24 inches in diameter.

The Perry Stove Company of Albany, N. Y., have issued some illustrated circulars relating to the World's Argand ranges and heaters. The range is illustrated in general view and sectional cut, the latter showing in detail the features incorporated in the stove, and indicating the manner in which the grate may be easily removed. The merits of the stove are set forth at considerable length, and in a way to interest the dealer. The circular relating to the World's Argand base burner shows the construction, in general and sectional views, while setting forth the reasons why the heater is a success. The improvements which have been incorporated in the stove for this year are principally in the nickel section above the combustion chamber, which is enlarged and changed in form and ornamentation.

We have received from the Warren Hardware Company of Warren, Ohio, an interesting pamphlet relating to the Warren steel range, which is constructed of cold-rolled steel and offered at a low price. The oven plates of the range are of wrought steel, held in place by surrounding wrought-steel construction, thus reducing the liability to warp or fracture from unequal expansion to a minimum. The oven bottom is well braced and bolted, and the oven is ventilated in a way to produce desirable results in operation. The flues are asbestos lined, which prevents the heat from radiating into the room and retaining it where it is most needed. The top warming closet is made with sliding doors, which may be partially or wholly opened, thus preventing the escape of more heat from the warming closet than necessary while placing food within. The Warren range is illustrated in several of its varieties, while tables show the size of ovens, top cooking surface, the prices of the range complete, and also of water fronts and high closets.

The Channon Emery Stove Company of Quincy, Ill., are distributing a four-page folder illustrating and describing their Cheerful Oak heater, which has been brought out this season. The stove is carefully mounted,

has large feed doors, spark arrester, low ash pit, draw center grate for coal and half solid grate for wood, and is ornamented with nickel trimmings and spun-brass urn with jewel. The stove is made either round or square base and is intended for burning coal or wood.

THE TROY NICKEL WORKS of Troy, N. Y., have been mailing postal cards to their friends in the trade bearing the following inscription: "It is really tiresome to hear this one and that one saying 'How hard are the times.' We do not feel the effect. The banks in Troy will let us have all the money we want, and it would be well for you to remember that the Alaska is always cold. Yours with Cleveland's object lesson, Troy Nickel Works."

THE FOLLOWING have recently been passengers on the Jewel Tally-ho coach, which, as our readers will remember, is run by the Detroit Stove Works between their Chicago office and the World's Fair grounds: Mr. and Mrs. A. Ehrlich, M. Kaufmann, J. La Fevre and lady, Mrs. F. H. Fogarty and party, R. Freytag and wife, Mr. and Mrs. Chas. Daloke and Mrs. Dunkelberg, Chicago; Mrs. L. Senger, New York, N. Y.; O. L. Frazier, Davis City, Iowa; W. H. Klauer, F. Heer, Jr., and F. G. Becker, Dubuque, Iowa; J. Kramer and Miss Lizzie Etyler, Dayton, Ohio; Mr. and Mrs. Kuist, children and friends, Highland Park, Ill; Mr. and Mrs. C. N. Stevens and Miss Blanche Gibbons, Gainsville, Texas; Mrs. J. F. Schall, Batavia, Ill.; E. Bouquet, St. Paul, Minn.; Miss Helen A. Swartout and Miss Caroline H. Swartout, Owego, N. Y.; Miss Mary D Spaulding, Brooklyn, N. Y.; Mrs. W. J. Prisch, Aurelia, Iowa; H. F. Taylor, Miss Louise F. Dodge and Miss Florence H. Pomeroy, Adrian, Mich.; Mr. and Mrs. L. Rosenberg and son, Mrs. A. Felsenthal, South Chicago; Mr. and Mrs. W. F. Lane, Shumway, Ill.; Mrs. H. C. Ambler, Mrs. Page, Mr. Munson, Martin Hemingway and lady, Mrs. John Cohn and Max Wolff, all of Chicago; Mr. and Mrs. J. M. McFarlane, Detroit; B. E. Stoddard and Chris. Rensch, Madison, So. Dak.; Mr. and Mrs. M. J. Williams, Baton Rouge, La.; Mr. and Mrs. E. P. Hainski, Newark, N. J.; Miss Mollie Kornblum, Pittsburgh, Pa.; Miss Jane Morrow, Miss Alice Morrow, Miss Rose Ucker, and Miss Ida Peedles, all of Circleville, Ohio; J. McMullen and son, Circleville, Ohio; John R. Fenn, Hartford, Conn.

THE THATCHER FURNACE COMPANY, 33 Peck slip, New York City, have met with such a demand for their furnaces and single-oven ranges that they have concluded to put on the market a new double-oven range of attractive design, and embodying the latest improvements. The company are enjoying a good trade, the demand emanating from all sections.

IT IS A CURIOUS THING, looking remarkably like a "ginger snap," so popular among children, even those of a larger growth. Turning it over, however, it is seen to be made of paper and bears on it the printed legend, "With lots of 'snap' and plenty of 'ginger' in our methods we make the very best goods of the kind that money and ingenuity can produce." Then follows the Garland trade-mark. It is a very neat advertising device now being distributed by the Michigan Stove Company.

A. G. MOORE & CO., 47 Court street, Boston, Mass., will shortly put on the market a new and improved petty ledger, especially adapted for stove dealers, which will include all the points of their Boston ledger together with some new ideas, which, the manufacturers claim, will make it indispensable for small accounts.

SCRAP.

A RICH FIND of tin is reported from the Wheal Bassett district in Cornwall, England. The lode is valued at over $250 per fathom, and promises to yield valuable returns. A Plymouth, England, paper appeals to London brokers to interest their clients in Cornish mines, asserting that large tracts of unexplored mineral ground still exist in Cornwall, in which further rich deposits are likely to be discovered.

PRESS REPORTS state that the sheet steel works and tin-plate department of Wallace, Banfield & Co., Irondale, Ohio (near Wellsburg), have closed down for an indefinite period. Later reports state that the temporary closing of the works is only a precautionary measure. Nothing definite is stated concerning the future action of the company. Trade developments are awaited before operations will be pushed with the vigor of the past. In the meantime operations may be partially continued.

THE RETURNS of domestic tin-plate production for the present year are still held by the Treasury Department. The Washington correspondent of the New York *Journal of Commerce and Commercial Bulletin* says that the subject has been one to which Assistant-Secretary Hamlin has given a great deal of study, and it is hoped that something decisive in the question as to what constitutes American tin plates may be announced before long. The writer adds that the probability is that the decision will exclude from the class of American tin-plate production black plates imported into the country and dipped here. Colonel Ayer has, it is said, submitted his returns in a revised form, based upon a possible ruling excluding imported black plates.

IT IS A HEALTHY SIGN that in the present condition of financial storm and stress the American tin-plate manufacturers are holding their own so satisfactorily. While mills and factories are closing and industrial concerns have been failing right and left, we hear of but one tin-plate works which has as yet gone to the wall. This speaks volumes for the stability of the industry and the soundness of the men who have embarked in it.

MERRY & CLARK, successors to John Merry & Co., report that they are prepared to offer to the trade two brands of American-made roofing plates, manufactured specially for their house, namely, Lion, a high grade terne claimed as equal to Worcester, and Phœnix, a terne which they sell in competition with Alloway grade. These plates are made IC, 14 x 20 and 20 x 28.

A NUMBER of Welsh tin-plate works have closed down owing to the difficulty of obtaining coal, following on the strike of the miners.

The New England vessel owners are reported to be contemplating the laying up of coal vessels aggregating from 200,000 to 250,000 tons of coal-carrying capacity, in order to regulate coastwise freight rates on coal, so that a dividend may be earned, which, from the low rates ruling for the past four weeks, has been an impossibility. This action will materially reduce the amount of tonnage from which Baltimore, Philadelphia and Newport News shippers have been accustomed to draw.

The Sellers Gun Furnace.—A Washington despatch of August 10 reports that the parts of the new furnace for assembling heavy ordnance have reached the Washington gun shops from Philadelphia, and will soon be placed in position. The furnace is the invention of William Sellers, the machinery builder, and is intended to prevent the sticking of tube and jacket of great guns while in process of assembling. The naval ordnance officers are awaiting the results of the proposed system with great interest, as it is destined to change the method of assembling. Instead of the jacket being expanded in a pit and then placed over the tube, the tube is inserted in the furnace in a horizontal position, and while the intense heat is applied the tube is forced to its seat. A device is affixed to the tube so that a stream of cold water is applied to the tube as it is being shoved into the jacket. By this system the jacket is not free from the heat of expansion until the tube has been correctly inserted and the possibility of the jacket contracting upon the tube is therefore lessened. The first gun to be assembled by the Sellers furnace will be the nickel-steel gun, the parts of which are ready at the Washingon ordnance shops. This is the first nickel-steel weapon, and is intended as an experimental gun to be used at the Indian Head proving ground in testing powder. The gun is of 8-inch calibre. It will be assembled as soon as the pyrometers, used for measuring the temperature in the furnace, are received.

A new naphtha launch, the "Queen Anne," excites some interest in engineering circles in Chicago. The explosion in the naphtha vapor which furnishes the power is caused by introducing an electric spark. The "Queen Anne" and her engine were designed and built by Thomas Kane of Racine, Wis., and brought to Chicago for trial. The naphtha is changed into vapor in the front part of the boat, and is conducted to the cylinders of the engine. The electricity is furnished by a six-cell battery under the floor, and the wires lead to the two cylinders. The chief merit of this engine over steam for a small boat is that it does away with heat, the boiler and fire box of the ordinary launch being done away with. The engine is easy to handle, and the boat does not require a licensed engineer and pilot. The machinery develops about 10 net horse-power, and will run the launch about 10 miles an hour. The propeller wheel is 32 inches in diameter. The boat itself is 33 feet long and 8 feet beam, and draws 32 inches. During the run from Racine to Chicago the engine behaved well, and Mr. Kane is confident that it will revolutionize the motive power of small boats.

The Mississippi Valley Lumber Association meeting last week in Minneapolis in semi annual session agreed to reduce the cut for the rest of the season one-half. The sawmills will be closed on September 20.

TRADE REPORT.

The Iron Market.

Eager watchers of the Iron markets note in some instances the first symptoms of a better feeling. It is probably natural that even the slightest evidence of a turn is given attention beyond its real significance. But affairs have been in so wretched a condition and bad news has been so overwhelming that any offset against them is hailed with delight.

Chicago is beginning to cultivate a hopeful view, largely based on the promise of a greater attendance at the fair. There has been some local buying of Pig Iron, and the expected purchases of Bars by those who follow the leadership of the largest consumers are beginning to be noticed.

It is reasonable to look to the markets east of the Allegheny Mountains for the first signs, because it is in that territory that relatively there is the greatest production among the rolling mills and steels works. In the West so many are still idle, undergoing repairs or awaiting settlement of wages questions, that what work originates in neutral territory goes to the Eastern mills. The first step in the direction of an improvement must come in the shape of a larger volume of business. Since occasional transactions of magnitude are cropping up, the inference is drawn that the very worst is over. There will, however, have to be quite a prolonged period of activity, involving heavy sales of materials, before there is any prospect whatever of better prices.

Pig Iron.—The volume of current business in the New York market is very light, and the market continues weak. We quote Northern brands $14 @ $15 for No. 1; $13.25 @ $14.50 for No. 2, at tidewater. Southern Iron, same delivery, $13.75 @ $14.50 for No. 1; $12.25 @ $13.25 for No. 2; $12 @ $12.25 for No. 3; $12 @ $12.25 for No. 2 Soft, and $12.50 @ $13 for No. 1 Soft.

Our Philadelphia correspondent reports the movement of Pig Iron in that district as unusually light, although, in view of the general surroundings, it is perhaps as large as could be expected. Furnaces are not accumulating stock to any extent, neither are they making many new sales, deliveries being chiefly to fill former engagements. Inquiries are being made for additional quantities, but they have not resulted in much business, as neither side is particularly anxious to enter into new engagements. Ultimately, it is believed that prices will make a sharp advance, as the curtailment in supply is bound to result in scarcity sooner or later. Meanwhile sales continue to be made at about last week's figures, which are usually as follows for Philadelphia and equivalent points, with spot cash transactions at 25¢ @ 50¢ less, according to circumstances :

American Scotch, No. 1X...	$16.00	@	...
American Scotch, No. 2X...	15.00	@	....
Standard Penna. (Lake Ore), No. 1x.....	14.75	@	$15.25
Standard Penna. (Lake Ore), No. 2x.....	14.00	@	14.50

There is practically no market for Pig Iron in Pittsburgh, except for a few small sales occasionally to meet immediate requirements of buyers. Not since the long Coke strike of two years ago or more has the production of Pig Iron in that district been so low as it is at the present time. Foundry Irons are dull and neglected, due to the curtailment of operations among the foundries. Quotations are given as follows :

No. 1 Foundry	13 00	@	13.25	cash.
No. 2 Foundry	12.00	@	12.25	"
Charcoal Foundry No. 1	15.00	@	16 00	"
Charcoal Foundry No. 2	14.00	@	15.00	"

Agricultural implement makers are the only consumers now buying Pig Iron to any extent in the Chicago market. General foundrymen are buying sparingly, but inquiries are being made which may lead to business soon. The usual carload trade has been interfered with by sales at very low prices of stocks held by bankrupt foundries. These stocks were not large and are now well out of the way. The Malleable Iron Work Syndicate are understood to be feeling the market on Lake Superior Charcoal and are likely to purchase heavily when they decide to close. Quotations are as follows, subject to concessions for prompt cash and immediate shipment :

Lake Superior Charcoal.....	$16.00	@	$16.25
Local Coke Foundry, No. 1...	13.50	@	14.00
Local Coke Foundry, No. 2...	12.75	@	13.00
Local Coke Foundry, No. 3...	12.50	@	12.75
Local Scotch.....	14.00	@	15.00
Ohio Strong Softeners.....	15.75	@	16.25
Southern Silvery, No. 1. ...		@	14.50
Southern Silvery, No. 2.....		@	14.00
Southern Coke, No. 2.....	12.60	@	12.85
Southern Coke, No. 3	12.10	@	12.25
Southern, No. 1, Soft.....	12.60	@	12.85
Southern, No. 2, Soft.....	12.00	@	12.25
Tennessee Charcoal, No. 1...	16.00	@	16.50
Alabama Car Wheel.....		@	18.85
Hocking Valley, No. 1	15 25	@	15.50
Jackson County Silvery.....	16.50	@	17.00

The Southern Pig Iron market grows worse, if possible. There have, however, been some sales of No. 2 Foundry for delivery monthly during the remainder of this year at $8.50 ℔ ton, f.o.b. Birmingham, but not to any large extent, and while furnaces are indifferent about selling at this price, there are few buyers. This Iron has been sold for spot cash at 25¢ ℔ ton less, but while any price might be accepted by a needy furnace for cash in hand, there appears to be less urgency to sell, probably because there is less Iron being made, but there is an ample supply for the greatly reduced demand. Quotations are generally as follows :

Foundry.

Southern Coke, No. 1.	$12.75	@	$13.00
Southern Coke, No. 2.....	11.25	@	11.50
Southern Coke No. 3.....	10.75	@	11.00
Ohio Soft Stone Coal, No. 1....	15.50	@	16.00
Ohio Soft Stone Coal, No. 2....	14.50	@	14.75
Lake Superior Coke No. 1.....	15.00	@	15.25
Lake Superior Coke No. 2.....	14.00	@	14.25
Hanging Rock Charcoal, No. 1..	18.50	@	19.00
Hanging Rock Charcoal, No. 2..	17.50	@	18.00
Tennessee and Alabama Charcoal, No. 1.....	14.00	@	14.25
Tennessee and Alabama Charcoal, No. 2.....	13.00	@	13.25

Car Wheel and Malleable Irons.

Standard Southern Car Wheel	17.75	@	18.00
Lake Superior Car Wheel and Malleable.....	17.00	@	17.25

Metal Market.

Pig Tin.—Prices for Pig Tin have dropped about ¼¢ ℔ pound under the weight of combination of unfavorable circumstances, not the least among which is pressure by the "bear" interest, which, apparently, misses no opportunity to take advantage of every circumstance that may be turned to its account. New speculative deals have been few in number and invariably on a small scale. Purchases for trade and consumptive account seem also to have been below the average, although sufficient to make quite an impression upon spot supplies. On late dealings the price for spot stock dropped to 18.20¢. August delivery went quite as low and September was offered at 18.35¢. Cables to the Metal Exchange noted that Straits shipments during the first half of August were 1000 tons to Great Britain and 800 tons to the Continent, against a total of 2025 tons during the corresponding period last year.

Copper.—The demand from consumers drags slowly, and is considerably below the average for this season. Such demand as exists is almost altogether for small quantities. Contraction of work at various large brass manufacturing establishments and in other lines of industry in which Copper is more or less extensively consumed (the outcome of general trade depression) has effectually offset the best efforts of producers to maintain prices by restricting the output. In other words, the demand has fallen off quite as much or more than the supply. Hence, any effort to expedite business leads to weakness in prices, and, while not numerous, such efforts have been sufficient to keep the

market weak and unsettled. Lake Superior Ingot is, at present, freely offered at 9¾¢. Other varieties are relatively as low, say about 9½¢ for Electrolytic and 9¼¢ for common casting stock.

Sheet Copper.—No change has taken place in the market for this material. The demand continues limited, comparing unfavorably with the usual business done at this season. Prices are unchanged.

Pig Lead.—There has been only a very moderate business during the past week. The demand continues sluggish, the result of restricted consumption and a general disinclination to lay in any stock. Such business as was effected went at about 3.30¢, indicating a fair undertone of steadiness, despite the trying conditions of unusually dull trade.

Spelter.—There has been a drop in price to 3.80¢ @ 3.85¢ for standard Western brands, delivered here or at common point. Comparatively little business is being done in this metal. Narrow consumption and monetary conditions are the guides of price, which depends entirely upon magnitude of orders, prompt payment, &c.: For small lots 4¾¢ @ 5¢ for Western is quoted, but these prices might be shaded on desirable orders.

Tin Plates.—Dullness is still the conspicuous feature of the market. There are hardly any inquiries for futures and spot stock, except in small quantities, is not wanted. Prices are unsettled and irregular, with a decided bearing in buyers' favor, particularly in case of ordinary Cokes. Concessions of 2½¢ @ 5¢ from the popular figures are not infrequent for spot cash. The packing business, except among some of the stronger concerns, is almost at a standstill for lack of accommodations wherewith to pay for material, consequently the usual demand for Coke Plates at this season is much curtailed. In all lines, however, stocks are believed to be very light throughout the country, and a reviving demand of a large character is by many anticipated in the fall. A moderate demand exists for domestic Roofing Plates, but stocks of these are being piled up at some of the works to a greater extent than heretofore, indicating some falling off in the consumption, as the importation of Terne Plates has dwindled considerably at the same time. British advices of August 16 report somewhat better inquiry from America for Tin Plates, chiefly oil sizes, on which very close prices can be obtained.

Sheet Iron.—No improvement is to be recorded in the demand for Black Sheets. With cash in hand buyers could probably name their own prices. Large consumers, who usually buy ahead are this year purchasing from time to time to fill their immediate requirements. Galvanized Iron makes a rather brighter showing. A moderate demand exists for this material, of a "little and often" character, keeping the trade going in a satisfactory manner. Makers are, it is said, talking of advancing the price on Galvanized Sheets, stocks being low and an augmented demand looked for in the coming months.

Chicago Report.

Scrap.—Buying prices are now as follows:

	Per net ton.	Per lb
No. 1 Wrought Scrap	$8.00	....
Machinery Cast	6.00	....
Malleable Cast	6.00	....
Stove Plate (free of burnt)	5.00	....
Burnt Iron and Grate Bars	4.00	....
Sheet Iron and Hoops	3.00	....
Plow Steel and Breaking Stock	6.00	....
No. 2, such as Shovels, Hoes, &c.	4.50	....
Old Boilers—whole (Iron)	6.00	....
" (Iron)—cut in single Sheets and Rings	9.00	....
Old Gas-Pipe and Boiler Tubes	5.00	....
Cast Borings	3.50	....
Turnings	5.00	....
Horseshoes	9.00	....
Copper Bottoms	....	5½¢
Copper Clips and Heavy	....	6½¢
Heavy Brass	....	6 ¢
Light Brass	....	4 ¢
Pipe Lead	....	2½¢
Tea Lead	....	2 ¢
Zinc	....	2¼¢
Rubber	....	2 ¢

Anthracite.—Dealers continue to quote carload lots of 12 net tons as follows:

	Grate.	Egg, Sto. and Ch.
Chicago, Ill	$5.85	$6.10
Milwaukee, Wis	5.85	6.10
Kansas City, Mo	9.05	9.30
Council Bluffs, Iowa	9.05	9.30
Lincoln, Neb	9.20	9.45
Sioux City, Iowa	9.05	9.30
Aberdeen, S. Dak	9.10	9.35
Dubuque, Iowa	7.15	7.40
Madison, Wis	7.35	7.60
St. Paul, Minn	8.35	8.60
Burlington, Iowa	7.35	7.60
Des Moines, Iowa	8.80	9.05
Davenport, Iowa	7.15	7.40
St. Joseph, Mo	9.05	9.30
Leavenworth, Kan	9.05	9.30
Omaha, Neb	9.05	9.30

Colorado Anthracite.

COLORADO FUEL & IRON COMPANY.

Denver	$8.00
Pueblo	8.00
Colorado Springs	8.00
Leadville	8.00
Cheyenne, Wyo	10.00
All points between Denver and Missouri River	9.35

THE ELMIRA STAMPING & PAPER MFG. COMPANY, Elmira, N. Y., make a specialty of Jute, Rag, Rope and Manila Papers, which they sell direct to the manufacturers of Tinware, Wire Goods, Hardware, Enameled Ware, &c. The company refer to the quality of these papers. They are also putting on the market the Ithaca Red Rosin-Sized Sheathing Paper. The company's paper mills are located at Ithaca, N. Y.

CAVANAGH & THOMPSON, jobbers of Wooden Ware, Brushes and House-Furnishing Goods, 130 Reade street and 13 Hudson street, New York, who were burned out recently, have decided to go ahead at the same stand, and hope to be in condition to execute orders by September 1. Their loss on stock amounted to about $4000, fully insured. They have settled with the underwriters and have about closed out such stock as the fire left. A force of carpenters will be put in as soon as practicable, the interior renewed and a stock of merchandise installed, with which to resume business.

CONDITION OF THE

Hardware Trade.

THERE is little in the condition of affairs in the Hardware trade to indicate the approach of the activity which in ordinary times would be expected to begin about this season. Travelers are to a large extent at home, and manufacturers and jobbers are making slight efforts to secure trade. Prices on manufactured goods are generally low and already based on cheap raw materials. Stocks are generally small, or at least moderate, and there is but little inducement to force goods on the market at lower prices, even if this course would result in a large increase of business, while manufacturers are continuing the conservative policy which they have pursued for many months, in reducing production to conform to the conditions of the times.

Advices from Chicago.—Hardware jobbers talk more cheerfully, although they do not claim that business is much better, but there is a slight improvement which makes them feel that the worst is over. Every day also brings the time nearer at hand when preparations must be made for cold weather, and this will certainly add to the volume of business. The news from agricultural districts is encouraging and farmers are expected to be in good condition shortly from the heavy demand for food products. This will at once be reflected from the retail Hardware trade. There is some apprehension that a revival in trade may be so sudden that it will catch dealers generally very short of stock. The Heavy Hardware trade is in better shape than a short time since owing to the improved demand for iron and steel from consumers who usually buy of manufacturers direct. Collections are by no means poor.

Notes on Prices.

Cut Nails.—The demand continues small, transactions are few and the quotation of $1.05 for carload lots at mill remains unchanged, but this figure is more firmly maintained than it has been, this market feeling the influence of the improvement in Wire Nails. Small lots from store in New York are held at $1.30.

Advices from Chicago.—An improvement is noted in the demand for Cut Steel Nails. Good specifications have been received by manufacturers within the past week. It is too early yet to found much hope on the movement, which may or may not be the forerunner of a better condition of things. Prices are unchanged at $1.20 to $1.25, Chicago, for factory lots, and $1.25 to $1.30 for small lots from stock.

Wire Nails.—The makers of Wire Nails appear to have succeeded in establishing an understanding among themselves, and the quotation has been

advanced to $1.50 for carload lots at mill by all the makers. The mills remain generally closed and stocks there are very much reduced and assortments broken.

Advices from Chicago.—Buyers seem to have suddenly found that they need Wire Nails; even those who did not expect to be in the market for several weeks. Inquiries are numerous and sales have been made at advanced figures. The price for factory lots is now $1.50, Chicago, and makers say that there will soon be another rise. Factories are still shut down and stocks are badly broken. Some manufacturers have not made deliveries for two weeks on old contracts, although importuned by their customers, alleging that they have no stock to ship from. Jobbers' prices are maintained at $1.55 to $1.60, according to quantity.

Barb Wire.—Business in this line continues confined to small lots, and we continue $2.45 to $2.50 as the nominal quotation for carload lots of Four-Point Galvanized at mill, small lots from store being held at the usual advance.

Advices from Chicago.—The Ellwood Mfg. Company have issued a circular quoting Glidden Wire at $2.10, Junior Wire $2.05, Ellwood Four-Point $2.05, for carload lots of Painted, with 5 cents advance for less than carloads, and 40 cents advance for Galvanized, at their factory at DeKalb. Terms are 60 days, or 2 per cent. off for cash in ten days. These prices only hold good for stock on hand. The company further state that they will hereafter refuse to give long credits, usually known as spring terms. This is an important announcement, and introduces a reform in the Barb-Wire trade which will be appreciated by other manufacturers. The practice is to be stopped of dating bills ahead and carrying accounts for an indefinite time on the payment of interest. Manufacturers report a decided quickening in the demand, although sales thus far have been mainly in small quantities. Transactions are exclusively for cash. Carload lots of Standard Barb Wire are quoted $2.10 and $2.50 respectively for Painted and Galvanized. Small lots from stock are held at $2.20 and $2.60.

Meat Tenderer.—The Frasse Company, 19 Warren street, New York, as agents for the Lavigne & Scott Mfg. Company, New Haven, Conn., are offering the Lavigne Peerless Meat Tenderer. This article is sold to the trade at a discount of 20 per cent. from the following list:

	Each.
Japanned and bright	$1.00
Full nickeled	1.25

Spery Combination Grater and Slicer.—This article was recently described in our columns. It is put on the market by the Chicago Hardware Specialty Company, 147 and 149 Lake street, Chicago, and is sold to the trade at $2.50 per dozen and $22.50 per gross.

Preserve-Jar Holder.—This article, which is being introduced by Francis H. Loss, Jr., 33 Murray street, New York, is sold to the trade at $3 per dozen list, subject to a discount of 10 per cent.

Cordage.—Affairs in the Cordage world, which were very mixed up to last week, are now assuming a more tangible form. The National Cordage Company have a manufacturing capacity equal to about 60 per cent. of the entire output. The balance is controlled by independent operators. The receivers of the National Company recently made an agreement with John Good to restore prices to a basis that would give a difference of 4 cents per pound between the finished product and the raw material. At the time it was suggested that a meeting of the independent manufacturers be called for the purpose of ratifying this price. The meeting was held on Wednesday and Thursday of last week, but the National Cordage Company were not represented.

It was decided to form a Protective Association for the purpose of deriving a greater net revenue from the business. In the absence of a representative from the National Cordage Company, it was considered a little premature to take any action on prices. The lines were laid for a working agreement which will maintain prices and facilitate the purchase of raw material.

A decision reached at the meeting—namely, to replace machinery now in use by that manufactured by John Good—was a most important step in its bearings on the future of the industry. It was demonstrated that the new spindles will manufacture Cordage 1 cent per pound cheaper than the old. This is partially due to the fact that one new spindle will do the work of two old ones. The number of spindles to be replaced under the agreement is 2000.

The National Cordage Company have in use spindles similar to those which are to be replaced by the independent mills.

From this it will be seen that the minority interest, which is perfectly solvent, has taken steps which will give it 1 cent per pound advantage over the majority interest, which is as yet insolvent. It is current opinion that the leverage which is thus secured by independent manufacturers will be used to force the National Cordage Company into some sort of a relation which will be beneficial to all makers.

Glass.—The situation of the Window-Glass market is about the same as reported last week. Eastern prices of domestic and imported Glass conflict in some cases, resulting in lower figures being named than the National official prices. Glass for immediate consumption is selling in small quantities, and it is understood that stocks in dealers' hands are generally low. Nothing definite was done regarding wages at the meeting of the National Window Glass Company, held at Chicago last week, further than to instruct the Wage Committee to arrange for a lower scale than that of the last fire. Various manufacturers and jobbers name October 1 to December 1 as the probable dates between which factories will start up. There is nothing new in the Plate-Glass market, and quotations on all kinds of Glass remain unchanged.

Old Rubber.—The market for this material is weak. Little or no purchasing is being done, and prices can only be quoted as approximate. The following quotations represent the prices for Old Rubber delivered in New York:

Car Springs, ton lots, ℔ lb.	....	@	$0.03¼
Rubber Shoes, carloads, delivered at factory, ℔ lb..	....	@	.03
Rubber shoes, less than carloads	2¼	@	.03⅛
Large Hose, ℔ ton	....	@	9.00
White Wringer Rolls, ℔ lb.	....	@	.04¼
White Syringes, ℔ lb.	....	@	.05

Old Rags, Paper, &c.—Buying is being done only in a few special lines. The market for Paper Stock is weak and dull, owing to the suspension of operations by many Paper mills. The following nominal quotations represent the outside prices, delivered in New York:

No. 1 White Rags	℔ lb	3¼ @	3½¢
No. 2 White Rags	℔ lb	..	1¾¢
Mixed Rags	℔ lb		1 ¢
Blues and 3ds	℔ lb		1 ¢
Hard Sized White Shavings	℔ lb		2½¢
No. 1 White Book Shavings	℔ lb	2 @	2½¢
No. 2 White Book Shavings	℔ lb	@	1¼¢
Light Book Shavings	℔ lb		¾¢
No. 1 Mixed Shavings	℔ lb		1¢
No. 2 Mixed Shavings	℔ lb		½¢
No. 1 Printed Books	℔ lb	1 @	1¼¢
Ordinary Mixed Books	℔ lb	½ @	¾¢
Newspapers	℔ lb		½¢
No. 1 Manila Paper	℔ lb	1 @	1⅛¢
No. 2 Manila Paper	℔ lb	¾ @	⅞¢
Bogus Paper	℔ lb	⅝ @	¾¢
Common Paper	℔ lb	¾ @	½¢
Straw Chips	℔ lb	½ @	⅝¢
Binders' Clippings	℔ lb	½ @	⅝¢
Jute Butts	℔ lb	1	1/10¢
No. 1 Jute Bagging	℔ lb		1¼¢
Mixed Bagging	℔ lb	¾ @	1 ¢
No. 2 Bagging	℔ lb	½ @	¾¢
Hemp Twine	℔ lb		2¼¢
Manila Rope	℔ lb		2½¢
Jute Rope	℔ lb	1½ @	1¾¢
Mixed Rope	℔ lb	¾ @	⅞¢

Old Metals.—The market for Old Metals continues dull. Nothing is being done in futures, and spot business is only to the extent of immediate requirements. Prices are weak, the following quotations showing those now ruling in New York:

Heavy Copper	℔ lb	8¾¢
Light and Tinned Copper	℔ lb	7¼¢
Heavy Brass	℔ lb	6¢
Light Brass	℔ lb	5¢
Lead	℔ lb	3¢
Tea Lead	℔ lb	2¾¢
Zinc	℔ lb	2¾¢
No. 1 Pewter	℔ lb	14¢
No. 2 Pewter	℔ lb	7¢
Wrought Scrap Iron	℔ gross ton,	$13.00
Heavy Cast Scrap	℔ gross ton,	9.00
Stove Plate Scrap	℔ gross ton,	6.00
Burnt Iron	℔ gross ton,	4.00

IT IS CLAIMED that the only Tube works now in full operation in the United States is that of the Syracuse Tube Company of Syracuse, N. Y.

Trade Notes.

THE NEW ERA RADIATOR is a seasonable article which is illustrated and referred to in the advertisement elsewhere of Wilmot Castle & Co., Rochester, N. Y. Any one wishing full information of this or other goods manufactured by the above firm can obtain it on application.

THE ÆTNA STANDARD IRON & STEEL COMPANY, large manufacturers of iron and steel sheets and bars, at Bridgeport, Ohio, have been compelled to make a general reduction in wages, which affects officials of the concern as well as employees. For the purpose of meeting any urgent demands on the part of their customers, and also to assort up their stocks, the Ætna-Standard Iron & Steel Company have started up three of their light sheet mills, and will, therefore, through their period of idleness be able to meet any ordinary call for supplies of stock material. The firm have not fixed any date for a general resumption of work.

REPORTS from Cincinnati, Ohio, indicate that a movement is well under way for a resumption of operations in the rolling mills of that district. During the summer shut down the Newport Iron & Steel Company have put a new foundation under their large engine. It is expected that work in their mills will be commenced very soon. This concern make a specialty of light sheets for roofing and corrugating purposes. The jobbing mill of the Licking Rolling Mill has been changed to a light sheet mill and other improvements have been made. This mill resumed work on Wednesday, July 9, and the outlook is good for steady work. The Cincinnati Rolling Mill Company, who are now proprietors of the Riverside Mill, have also changed their jobbing mill for the purpose of making light sheets exclusively, the product being used largely for galvanizing purposes. This plant is now in full operation. At Mitchell, Tranter & Co.'s mills no changes were made this summer. Operations have commenced and a steady run is anticipated. The Anchor Iron Works, formerly owned by the late Colonel Dayton, which were sold recently for the extraordinarily low sum of $38,000, are still idle and nothing can be learned concerning the future of this plant. Machine shops, boiler works and other industries allied to the Iron and Steel trade are doing a fair business.

THE NOVA SCOTIA STEEL & FORGE COMPANY, New Glasgow, Nova Scotia, are making extensive additions to their works. A Boiler-Plate mill is contemplated, and it is probable that a Sheet mill will follow. The Dominion of Canada consumes large quantities of iron and steel each year, but none are manufactured in that country. Statistics show that nearly all that is used is imported from Great Britain.

IN ALL PROBABILITY an arrangement will be consummated at an early date by which the large plant of the National Tube Works Company, at McKeesport, Pa., now idle in all departments, will be put in partial operation. W. C. Converse, general manager of the concern, was in McKeesport last week, and it is believed that, as a result of his visit, the workmen will agree to accept a temporary reduction in wages, with the understanding that with improved trade conditions the reduction will be restored. It is stated that a full appreciation of the condition of affairs exists among the workmen, and that they are ready and willing to agree to any arrangement by which operations can be resumed.

ON TUESDAY, the 8th inst., two lap-weld furnaces and two butt-weld furnaces in the plant of the American Tube & Iron Company, at Middletown, Pa., were put in operation. Future operations of the plant depend largely on the number of orders received and the general condition of trade. The present resumption is more of a cleaning up process, in order to get the stock on hand into a merchantable shape, than anything else It is probable that the works of this concern at Youngstown, Ohio, will also be put in partial operation during this week. Wages of employees at both plants have been reduced 10 per cent.

MERRY & CLARK, successors to John Merry & Co., whose new card is placed in our advertising columns, are pushing the sale of their well-known brand of imported Roofing Plates, Merry's Old Method, a heavily coated terne which they guarantee 120 pounds to the box. As was noted in a late issue, George E. Merry, son of the late founder of the firm and his associate up to the time of his death, has bought out all other interests, and in conjunction with Edw. Clark is continuing the busines of John Merry & Co. under the new title. Mr. Merry has conducted the business in the interest of the estate since his father's death.

CLINTON WIRE CLOTH COMPANY, Clinton, Mass., announce that William H. Howard has assumed charge of their New York store, having been succeeded in Chicago by Edwin F. Schmidt, for many years in the company's employ at factory and Chicago. The company also take occasion to thank their customers for their kind consideration since the destructive fire at their factory April 19 last, and state that in rebuilding they have largely increased the capacity of their plant and fitted it with the latest and most approved machinery, which will enable them to meet all demands and maintain the high quality of their goods.

CORDLEY & HAYES, 172 Duane street, New York, sole agents for the United Indurated Fiber Company of New Jersey, whose factory at Lockport, N. Y., was destroyed by fire on July 29, desire us to state that while this fire will seriously cripple them in filling orders for Pails, Tubs, Spittoons, Wash Basins, Butter Bowls and Slop Jar Mats, they are still in position to supply all orders for many of their lines, having the product of their other factories to fall back on. They are rebuilding their Lockport factory on a much larger scale than formerly, and are confident that in three months they will be again turning out goods from that point.

AT A JOINT MEETING of the stockholders and creditors of the Youngstown Stamping Company, held at Youngstown, Ohio, last week, it was decided not to take any steps looking to the taking of the business of the concern out of the hands of the receiver so long as the general depression in trade continues. For some months past the works of this concern have been operated under the management of W. C. Hine as receiver.

JAMES ECKELS has been appointed receiver of the Vienna Stamping & Enameling Company of Chicago, whose works are at Porter, Ind. The failure was precipitated by an attachment filed by the Roessler & Hosslander Chemical Company. It is reported that the liabilites are $80,000, and the assets $60,000.

LOUIS WAEFELAER, manufacturer of sanitary appliances, 54 Beekman street, New York, is distributing illustrated catalogue and price list D, which has been compiled largely for the use of architects. It calls attention to improved lavatories, noiseless syphon, washout and short-hopper closets and a line of sanitary specialties covering 46 pages $9\frac{1}{4}$ x $11\frac{1}{2}$ inches. Every illustration is accompanied by a plate number, which architects are urged to specify in ordering goods of this make. This house has been designated the sole agent for New Jersey for the sale of porcelain enameled bathtubs, made by the Standard Mfg. Company, Pittsburgh, Pa. These well-known goods are enameled by the natural-gas process, which we are informed insures a better and smoother finish, while the quality of the porcelain enamel is guaranteed to be the same regardless of the price of the tub, which may be more or less expensive in proportion to trimming or exterior finish.

THE TRADE are informed by a circular letter issued by the Steel Bath Mfg. Company, Detroit, Mich., that on account of the success of the Steel-Clad bath they have found it necessary to provide additional manufacturing facilities to supply the increasing demand. A company, therefore, has been formed for its manufacture in New York City, under the style of the Steel-Clad Bath Company of New York, 447 to 453 West Twenty-sixth street, New York, who will supply these goods for the Eastern trade, comprising the territory included in the following-named States, viz.: Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Pennsylvania, Maryland and District of Columbia. Arrangements have been completed whereby the old-established company, the John Trageser Steam Copper Works, will manufacture these baths for the Steel-Clad Bath Company. The latter firm likewise address a circular to architects, builders, plumbers and jobbers of plumbing material calling attention to the excellent features of this bath and describing its construction. The selling agent of the Steel-Clad Bath Company of New York is S. Davison, 447 West Twenty-sixth street, New York.

Excelsior Paste.

In response to repeated calls for a paste suitable for attaching asbestos paper to furnace pipes and stacks, the Excelsior Steel Furnace Company, Chicago, Ill., announce that they are prepared to supply a good article for that purpose. It is furnished in solid form and is prepared for use by adding two parts water to one of paste. They claim that it will keep indefinitely and secures the paper permanently to the pipes without wire, and is not molested by mice or rats. The paste has been produced specially for this purpose, and the steady increase in demand that has followed its introduction is referred to as one of its best recommendations.

The United States protected cruiser "Minneapolis" was successfully launched at Cramps' shipyard, Philadelphia, on the afternoon of Saturday, August 12, in the presence of the Vice-President of the United States, Secretaries Herbert and Morton, and a large number of Senators and Representatives from Washington. The christening ceremony was performed by a daughter of Senator Washburn of Minneapolis.

Industrial Growth Checked.

The manner in which the dearth of money has checked all industrial progress and the rehabilitation of insolvent enterprises is being very forcibly illustrated just now in a few notable instances in Wall street. The long period of depression and attendant bankruptcy which followed the May panic left a number of properties on the shoals. Of the dozen or more mention might be made of National Cordage, Reading, Erie and Northern Pacific. Efforts have been made in a number of cases toward reorganization with only partial success.

The Reading plan was the most favorable one to shareholders, but it fell through because of the opposition of certain general mortgage bondholders. It is generally conceded as fortunate that it did, for had the underwriting syndicate been called upon to hold up the company during the period of tight money through which the country is passing, the strain would have been seriously felt in other directions. The failure of the plan to go through further weakened public confidence, and, without doubt, contributed to the period of distrust which followed.

The Richmond Terminal plan, a most drastic one in its nature, was assented to by nearly all of the multitude of security holders who came under its jurisdiction, simply because it was the only action of a saving nature which they could take. The assessments were regarded as a hardship at the time it was launched, which was during a period when money was much easier than at present. Since the scarcity became aggravated many holders have been forced to sell out; as a result one of the stocks included in the plan, and a fair criterion of the others, sold at ⅞ of $1 per share, after two cash assessments aggregating $3⅛ had been paid thereon. This demonstrates that it is next to impossible to pay the assessments.

Cordage is another concern whose rehabilitation is being delayed on account of tight money. The plan provides for an assessment of 10 per cent. on the common stock and 20 per cent. on the preferred. The first assessment on each, amounting to $5 and $10 per share, respectively, was paid on July 10. The second assessment of $5 per share on each class, due August 10, was extended until August 26, with the understanding that it should bear interest at the rate of 6 per cent. Before the first assessment was paid the common stock was selling at about $10 per share; with the assessment paid the current price is about the same figure, it having lost 5 per cent. since July 10. This affords little encouragement to shareholders, who will soon be forced to pay the second assessment. No one questions the ability of the bankers' syndicate which has the reorganization in charge to bring it to a successful conclusion. The time required, however, will, unless conditions change materially, be longer than September 10, the date on which the last assessment on the preferred stock is due.

General Electric has a floating debt of about $4,000,000. It has been making heroic efforts to fund this, and without tangible results until lately. The stock, in consequence, sold down from 115 to 31, and is now about 40. We understand that a plan will be put out in a few days to care for this floating debt. From the little known of the plan the opinion formed is that drastic measures have been resorted to to raise the money. A security company will be formed with a preferred capital of from $4,000,000 to $4,500,000, entitled to 6 per cent. interest, and a common capital stock of from $4,000,000 to $4,500,000 to be given as a bonus to the subscribers of the preferred. This issue of from $8,000,000 to $9,000,000 stock is to be made to raise $4,000,000 cash. The assets against which the stock is to be issued are the security assets in the company's treasury, which, on January 1, represented a par value of $16,220,391, and an 8 per cent. value of $9,173,251. Of these stocks some 15,000 shares of New York Edison Electric Illuminating and 5000 of Boston Edison Electric Illuminating were sold early in the spring to relieve the more pressing needs of the company. The amount of these stocks which will be used to offset the stock to be issued is not known.

Another example of the damper which is being placed on industrial enterprises is the action taken by the Manhattan directors Tuesday regarding rapid transit in New York. This company went so far, late in the spring, in their negotiations as to offer the city $100,000 per annum in addition to their regular tax for franchises, reserving the right to build to Yonkers at their discretion. The city's proposition was not greatly different, and the belief prevailed that an agreement would be reached. The communication which will be read before the Rapid Transit Commission to-day will say that in view of the financial depression the Manhattan Elevated Railway Company deem it unwise to undertake extensions such as are proposed, thus giving up the project unless the Rapid Transit Commission deem it wise to wait until times change for the better.

Other examples might be cited, but the foregoing is sufficient to show that it is next to impossible, even where the strongest backing exists, to place enterprises on their feet, much less extend those which are in existence. In the same degree it is impossible to float new concerns, and it can be said that not one of any prominence has appeared in Wall street for four months.

The Chicago, Rock Island & Pacific Railway Company announce that they have extended the "Rock Island route" to Fort Worth, Texas, and are now in a position to transport freight of all kinds to and from all points in Texas. Arrangements have been perfected for first class freight service.

Considerable activity is developing in the oil districts of Peru. English companies in the trade are reported to have acquired tank steamers for transporting the oil to China. It is believed that the whole of the western slope of the Andes, from Colombia down to the southern extremity of Chili, is rich in petroleum.

Implement manufacturers and dealers in Minneapolis and St. Paul have had a desperately dull season, except in the line of harvesting machinery. In South Dakota, on the contrary, a very large trade has been done in all lines of agricultural machinery, owing to the great influx of immigrants to that State during the present season.

Comptroller Eckels predicts that nine out of ten of the banks which have closed during the present stress will open for business again.

Grain exports from Montreal this season have far surpassed in volume the shipments of any previous year.

The Treasury Department has issued a detailed statement of receipts from internal revenue for the fiscal year ending June 30, 1893, which shows an increase in nearly every department, even greater in proportion than the growth of the country in population. The net increase of receipts from all sources was $7,145,093, or from $153,857,544 in 1892 to $161,002,637 for the past fiscal year.

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Metal and Miscellaneous Prices.

CHICAGO, AUGUST 17, 1893.

Tin—

Straits pigs.....22¢

Imported Tin Plates—

Charcoal Plates.—Bright.

Guaranteed Plates command special prices, according to quality.

		Per box.
Calland and Melyn Grade	IC, 10 x 14	@ $6.75
	IC, 12 x 12	@ 6.75
	IC, 14 x 20	@ 6.75
	IC, 20 x 28	@ 13.50
	IX, 10 x 14	@ 8.75
	IX, 12 x 12	@ 8.75
	IX, 14 x 20	@ 8.75
	IX, 20 x 28	@ 17.50
	DC, 12½ x 17	@ 6.50
	DX, 12½ x 17	@ 8.50
Allaway Grade,	IC, 10 x 14	@ 6.50
"	IC, 12 x 12	@ 6.50
"	IC, 14 x 20	@ 6.50
"	IC, 20 x 28	@ 13.00
"	IX, 14 x 20	@ 8.00
"	IX, 20 x 28	@ 16.00

Coke Plates—Bright.

	Per box.
Steel Coke—IC, 10x14.14x20.85.85	@$6.00
IC, 14x20.90 ℔	5.60 @ 5.75
IC, 14x20, 100℔	@ 5.85
10 x 20	8.75 @ 9.00
20 x 28	11.70 @12.00
X, 10x14, 14 x 20	@ 7.50
B.V. Grade. IC,10x14. 14x20.5.85	@ 6.00

Charcoal Plates.—Terne.

Guaranteed Plates command special prices, according to quality.

Mansel and Dean Grades.—	
IC, 14 x 20	@ $5.62½
20 x 28	@ 11.25
IX. 20 x 28	@ 14.25
Worcester Brand and equal.—	
IC, 14 x 20	6.12½@
IC, 20 x 28	12.25 @
IX, 14 x 20	7.62½@
20 x 28	15.25 @

American Tin Plates.

Charcoal Plates.—Bright.

Irondale, A. A.—IC, 14 x 20	$7.00
" " IX, 14 x 20	9.00
" " IXX, 14 x 20	11.00
" " IC, 20 x 28	14.00
" " IX, 20 x 28	18.00
" " IXX, 20 x 28	22 00
Florence.—	
IC, 10 x 14, 12 x 12, 14 x 20	$6.75
IX, 10 x 14, 12 x 12, 14 x 20	8.75
Palma.—	
IC, 10 x 14, 12 x 12, 14 x 20	$7.50
IX, 10 x 14, 12 x 12, 14 x 20	9.50

Each extra cross $2.00 and 20 x 28 double these prices.

Brilliant, Tissue Packed, IC, 14 x 20	$9.25
Royal, extra, IC, 14 x 20	7.25
Merlon, IC, 14 x 20	7.00
Almond, IC, 14 x 20	6.50
Mint, IC, 14 x 20	6.25

Coke Plates.—Bright.

Elwood.—IC, 14 x 20	$6.00
" IC, 20 x 28	12.50

Roofing Plates.

Arch (205 ℔), 20 x 28	@$11.75
Palm (205 ℔), 20 x 28	@ 12.25
Crescent, IC, 20 x 28	@ 12.50
Crescent, IX, 20 x 28	@ 15.75
Empire, IC, 20 x 28	@12 75
Empire, IX, 20 x 28	@16.00
Hickory, IC, 20 x 28	@ 13.00
" IX, 20 x 28	@ 16.10
Alaska (heavily coated), IC, 20x28	@$14.50
Alaska IX, 20 x 28	@ 17.75
Special, IC, 20 x 28	@ 15.00
" IX, 20 x 28	@ 18.25
Merchant's Roofing (extra coated), IC, 20 x 28	@$17.75
Merchant's Roofing (extra coated), IX, 20 x 28	@$21.50
Merchant's Old Method, (extra heavily coated), IC, 20 x 28	@$19.75
Merchant's Old Method (extra heavily coated), IX, 20 x 28	$23.60
Irondale A:	
IC, 14 x 20	$6.25
IX, 14 x 20	7.75
IC, 20 x 28	12.50
IX, 20 x 28	15.50
Westmoreland:	
IC, 14 x 20	$6.25
IC, 20 x 28	12.50
Elwood:	
IC, 20 x 28	$12.00
Juno:	
IC, 14 x 20	$5.75
IC, 20 x 28	11.50
Illinois, Old Method:	
IC, 20 x 28	$17.00
E. L.:	
IC, 20 x 28	$12.50
Jessie:	
IC, 20 x 28	$12 00
Scott's Extra Coated, Stamped and Resquared, IC, 14 x 20	$9.50
Scott's Extra Coated, Stamped and Resquared, IX, 14 x 20	11.00
Scott's Extra Coated, Stamped and Resquared, IC, 20 x 28	19.00
Scott's Extra Coated, Stamped and Resquared, IX, 20 x 28	22.00
Neville, Stamped, IC, 14 x 20	6.25
" " IX, 14 x 20	7.50
" " IC, 20 x 28	12.50
" " IX, 20 x 28	15.00
Taylor's Old Style, IC, 14 x 20 (Stamped and Resquared)	$9.50
Taylor's Old Style, IC, 20 x 28 (Stamped and Resquared)	19.00
Taylor's Roofing, IC, 14 x 20 (Stamped and Resquared)	8.25
Taylor's Roofing, IC, 20 x 28 (Stamped and Resquared)	16.50
Columbia, IC, 14 x 20 (Stamped)	7.25
" IC, 20 x 28 (Stamped)	14.50
Maple, IC, 14 x 20 (Stamped)	6.75
" IC, 20 x 28 (Stamped)	13.50
Willow, IC, 14 x 20	6.50
" IC, 20 x 28	13.00
Knoxall, IC, 14 x 20	6.25
" IC, 20 x 28	12.50
Globe, IC, 14 x 20	6.00
" IC, 20 x 28	12.00
Miami, IC, 14 x 20	6.00
" IC, 20 x 28	12.00
" IX, 20 x 28	15.00
" (Redipped), IC, 20 x 28	17.00

Tin Boiler Plates.

	Per box of 100 sheets.	Per box of 112 sheets.
X, 14 x 28	$13.00	$13.00
XX, 14 x 28	14.50	14.50
X, 14 x 31	14.50	15.80
XX, 14 x 31	16.50	17.50
X, 14 x 56	29.50	16.50
XX, 14 x 56	32.50	18.20
X, 14 x 60	31.50	17.65
XX, 14 x 60	35.50	20.90

Sheet Iron—

Black.

	Common American	Refined.
Nos. 10 to 16	℔ 2 7-10¢	3 3-10¢
17 to 20	℔ 2 8-10¢	3 4-10¢
21 to 24	℔ 2 9-10¢	3½¢
25 and 26	℔ 3¢	3 6-10¢
27	℔ 3 1-10¢	3 7-10¢

Russia, Planished, &c.

Genuine Russia, all numbers....13¢ net.
Patent Planished....℔ D A, 10¼¢; B, 9½¢
dis. 5%

Galvanized.

Juniata or first quality.....dis. 70&5%

Copper—

Ingot.

Lake.....11⅞¢ @ 12¼¢
Casting Brands.....11¢ @ 11½¢

Sheet and Bolt.

Discount, 25%.

Copper Bottoms.

Discount, 25%.

Seamless Brass and Copper Tubes.

Base price, 17½¢, Chicago, with extras according to size.

Copper, Bronze and Gilding Tube, 3¢ ℔ ℔ additional.

Brazed Brass Tubing.

(To No. 20 inclusive.)

Add freight from New York to Chicago to these prices, or 50¢ ℔ 100 ℔.

Above 5-16 inch to 3 inch inclu	35¢
Plain, above 3 inch	45¢
Plain, 5-16 inch	45¢
Plain, ¼ inch	60¢
Plain, 3-16 inch	$1.00
Plain, ⅛ inch	$1.50
Fancy Tubing, Brass, to No. 20 incl	43¢ ℔
Bronze Tubing, 3¢ ℔ ℔ more than Brass	

35 @ 40%

Roll and Sheet Brass.

Discount, 35 @ 40%.

Slab Spelter—

Western Spelter.....5

Sheet Zinc—

600 ℔ casks.....6¼¢
Less than Casks, ℔ ℔.....6½¢

Lead—

Soft Pig Lead.....4½¢
Bar.....4.60¢@5¢
Pipe.....5½¢, dis. 10¢
Block Tin Pipe.....35¢
Sheet.....6¢, dis. 10%

Solder—

½&½.....13¼¢@13⅞¢
Extra Wiping.....12¢

The prices of the many other qualities of Solder in the market indicated by private brands vary according to composition.

Antimony—

Cookson.....12½¢@13¼¢
Hallett's.....11½¢@12¼¢

Wrought-Iron Pipe—

List on following page.

1¼ and under, Plain	57½&10%
1¼ and under, Galv	52½&10%
1½ and over, Plain	67½&10%
1½ and over, Galv	60&10%
Boiler Tubes, list Oct. 24, 1892	65@67½%
Casing, list Nov. 16, 1892	52½%
Inserted Joints Casing, list Nov. 16, 1892	47½%
Steel Boiler Tubes	27½%
Cold Drawn Seamless Steel Tubing	50%

Cast-Iron Soil Pipe—

Cast-Iron Soil-Pipe, Tarred; sizes 2 to 6 inches, inclusive.....dis 70&2½%
Other sizes.....dis 60%

Leader Pipes—

Abendroth's Galv'd Spiral Riveted	60%
Austin's Corrugated	60%
Gordon & Gilbert's Corrugated	60%
Ritchie's (Galv. Iron only) Cor'd	60%
Ritchie's Spiral Lock Seam, Galv'd	60%
Austin's Spiral Ribbed Pipe	60%
Plain Adjustable Elbows	60%
James A. Miller Bros. (Galv'd Iron only) Corrugated	60%

Furnace Fittings—

Discount from Excelsior Steel Furnace Co.'s list.....50%

Steel Roofing—

Perfection	$3.75 square
Climax	$3.50 square
The Lloyd Spanish Tiling	$4.50 square

Metallic Shingles—

Cushman's	$1.25 square
Merchant & Co.'s Spanish Tiles:	
Copper, 14 oz	$36.00 square
Steel, painted	$9.00 square

Drain Pipe—

Discount from list.....50%

Paints, Oils, &c.—

Deodorized Benzine	7½@8 ¢
Iron Paint, Bright Red	℔ D, 2 ¢
" " Brown	℔ D, 1½¢
" " Purple	℔ D, 2½¢
" Ground in oil, B. Red	℔ D, 6½¢
" Ground in oil, Red	℔ D, 6½¢
" Ground in oil, Brown	℔ D, 5½¢
" Ground in oil, Purple	℔ D, 6 ¢
Linseed Oil, Boiled, in bbls	53¢
Linseed Oil, Raw, in bbls	50¢
Mineral Paints	2@4¢
Orange Mineral	10¾¢
Pure White Lead in Oil	6¾@7¼¢
Dry White Lead in bbls	6½@6¾¢
Red Lead, American	7@7½¢
Red Venetian, English, dry	$1.65@$1.70
Red Venetian in oil; asst'd cans, 8¼¢; kegs	7¼¢
Sipe's Japan Oil, in bbls, ℔ gal	34¢
Spirits Turpentine, in bbls., ℔ gal	32½¢
Asphaltum, Trinidad Refined, ℔ ton	$45
Tarred Felt, 1 Ply, ℔ 100 ℔	$1.65
Tarred Felt, 2 Ply, ℔ roll 108 sq. feet	$1.50
Tarred Felt, 3 Ply, ℔ roll of 108 sq. feet	$2.00
Roofing Pitch, ℔ bbl. of 300 ℔	$3.20

NEW YORK, AUGUST 18, 1893.

Aluminum—

No. 2 Grade Metal, in ton lots..℔ ℔, $0.75
No 1 (guaranteed to be 98 % pure and over), in ton lots .....℔ ℔ .90
Lots less than 1 ton, 10¢ ℔ ℔ additional.

Antimony—

Cookson .....℔ ℔, 11¢
Hallett's.... .....℔ ℔, 10½¢

Brass—

Planished.....net
Roll and Sheet.....35@40%

Brass and Copper Tubes

Brazed Brass Tubing—

List May 20, 1889.

	Per ℔.
Plain, to No. 20 inclusive, above 5-16 inch to 3 inch inclusive	$0.35
Plain, to No. 20, above 3 inch	45
Plain, 5-16 inch to No. 20	45
Plain, ¼ inch	60
Plain, 3-16 inch	1.00
Plain, ⅛ inch	1.50
Fancy Tubing to No. 20, inclu	43

35@40%

Copper and Bronze Tubing—

3¢ ℔ ℔ more than brass.

Bronze, Tobin—

Drawn Rods for Bolts, Forgings, &c

Over ¼ to 3½ inches inclusive....17¢ ℔ ℔
Over 3½ to 5 inches inclusive.....18¢ ℔ ℔

Piston Rods, Finished True, Smooth and Straight.

Over ¼ to 3½ inches inclusive....18¢ ℔ ℔
Over 3½ to 5 inches inclusive.....19¢ ℔ ℔

Clips—

Buffalo Damper: Nos. 1, $1.25; 2, $2.50 per doz.....40&10%

onductors—

rugated. *Round or Square—*

Gal	nized.....60%
Gal	nized, Locked Joints.....60%
Tin	.....60%

Spiral Riveted—

alvanized 50%

See also *Elbows and Shoes; Eave-Trough Miters; Strainers, Conductor.*

Conductor Strainers—See *Strainers, Conductor.*

Copper—

Bottoms, Pits and Flats....25&25&5%

Ingot.

Lake.....11¢
Ansonia Grade Arizona.....10½¢
Ansonia Grade Casting.....10¢
Planished. .....net
Sheet and Bolt. .....25&25&5%

Tubes — See *Seamless Brass Tubes.*

Coppers, Soldering—

See *Irons, Soldering*, in Current Hardware Prices.

Damper Clips Buffalo—

See Clips, Buffalo Damper.

Eave Troughs—

Lap or Slip Joint, Galvanized.....60&10%
Lap or Slip Joint, Terne.....60%

Eave-Trough Mitres—

Lap or Slip Joint.....list, net

Elbows—

Plain Adjustable—

Tin.....70%
Galvanized.....70%

Crimped Tubing—

Re-Tinned or Galvanized.....35%

Stove-Pipe—

Buffalo Four-Piece.

4½	5	5½	6	7 inch,
$0.78	.87	.90	.99	1.20 per doz.

..20 %

Elbows and Shoes—

Flat Crimp.

Tin.....35%
Galvanized 35%

Corrugated.
Flat Crimp.

Galvanized.....60%

Round or Square.

Tin.....60%
Galvanized.....60%

Iron, Sheet—

Black.

	Common American.	B. G. Cleaned American.
Nos. 10 to 16	℔ D, 2½	3 10¢
Nos. 17 to 20	℔ D, 2.85	3.10¢
Nos. 21 to 24	℔ D, 2.94	3.20¢
Nos. 25 and 26	℔ D, 3.05	3.30¢
No. 27	℔ D, 3.15	3.40¢
No. 28	℔ D, 3¼	3½¢
American B. B.	℔ D, 4¢@4½¢	

Russia, Planished, &c.

Genuine Russia, according to assortment.....℔ D, 11¾@12½¢
Patent Planished....℔ D, A, 10¢; B, 9¢, 5%
Craig Polished Sheet.....℔ D, 8½¢

Galvanized.

	B. B.
Nos. 10 to 16	70&5%
Nos. 17 to 22	
Nos. 23 to 24	
Nos. 25 to 26	
No. 27	
No. 28	
Nos. 29 and 30	

Filter Joints—

Lee's.....33⅓ %

Lead—

American Pig.....4¢
Bar.....4½¢

New York Prices.

Pipe.....6¼¢, 20%
Tin Lined Pipe.....15¢, 20%
Block Tin Pipe.....37½¢, 20%
Sheet.....7¢, 20%
Old Lead in exchange, 3¼¢ ℔ D.

Pittsburgh Prices.

Lead Pipe in whole coils. ℔ D, .05¢, 10&5%
Sheet Lead in whole coils. ℔ D, .05½¢, 10&5%

Metal, Expanded—

Manufacturers' list No. 5.

Lathing	10%
Fencing, Painted Sheets	20%
Netting, Painted Sheets	20%
Door Mats, Galvanized	25%
Window Guards, Paneled	15%
Tree Guards, Paneled	15%

Mitres Eave-Trough—See *Eave-Trough Mitres.*

Paints Oils &c.—

Lead, Amn. White, Dry or in oil:	
Kegs, lots less than 500 ℔	7 @ 7¼
Kegs, lots 500 ℔ to 5 tons	6¾ @ 6¾
Kegs, lots 5 tons to 12 tons	6⅝ @ 6⅝
Kegs, lots 12 tons and over	6¼ @ 6¼
Lead, White, in oil, 25 ℔ tin pails, add to keg price.	

Lead, White, in oil, 12½ ℔ tin pails, add to keg price..... ... @ 1
Lead, Red, bbls. and ½ bbls... 6 @ 7
Lead, Red, kegs ... . 6¼ @ 7¾
Ocher, American ..... ⅛ @ 1¼
Red, Venetian, American ... ℔ 100 ℔..1.00 @ 1.1(

Linseed Oil:
City, raw, ℔ gal .... @ .50
City, boiled..... .. @ .53
Western, raw..... .. @ .50

Spirits Turpentine:
In regular bbls.....28½ @ . 29
In machine bbls .... 29 @ .29⅛

Putty:
In barrels and ½ bbls.....01⅜ @ .01¾
In tubs ..... .01⅝ @ .01¾
In tin cans ..... .01⅝ @ .02¼
In bladders ..... .01⅞ @ .02¼

Roofing Material, &c.:
Asphaltum, Trinidad Refined, ℔ ton. ....$30.00@$35.0(
Asphaltum, Rock, ℔ ton.....$14.0(
Coal Tar Felt, 1 Ply, ℔ ℔..... .....2¢
Coal Tar Felt, 2 Ply, ℔ roll 108 sq. ft. $1.42½
Coal Tar Felt, 3 Ply, ℔ roll 108 sq. ft. $1.8(
Roofing Pitch, ℔ bbl.....$2.2½

Pipe, Drain 50%

Pipe and Fittings, Cast Iron Soil—

Cast-Iron Soil Pipe, Tarred, sizes 2 to 6 Inches, inclusive.....60@60&10%
Other sizes.....55@55&10%
Cast-Iron Fittings, Tarred, sizes 2 to 6 inches.... .....60@60&10%
Other sizes.....55@55&10%

Pipe, Spiral—

Galvanized.....60%
Tin.....60%

Rock and Slag Wool—

	℔ ℔	℔ cub. foot.
Slag Wool, ordinary	1¼	19¢
Slag Wool, extra.	4¼	38½¢
Rock Wool, ordinary	2¾	27¢
Rock Wool, extra	7¼	43½¢

Rosin—

Common and Good—Strained,
Rosin, C. & D.....℔ bbl. $1.02@$1.05
Rosin, E. & F.....℔ bbl. $1.20@$1.30
Rosin, G. & H.....℔ bbl. $1.50@$1.75
Rosin, I. & K.....℔ bbl. $2.00@$2.40
Rosin, M. & N.....℔ bbl $2.60@$3.50

Seamless Brass Tubes..net

Shoes and Elbows—See *Elbows and Shoes.*

Slate Roofing—

According to size, f.o.b. cars, Quarry Station.

Pennsylvania:
Best Bangor, ℔ sqr.....$3.25@$4.50
Pen Argyle, ℔ sqr..... 3.50@ 4.25
Peach Bottom, ℔ sqr..... 5.00@ 6.25
No. 1 Chapman, ℔ sqr..... 4.00@ 4.65
Lehigh Slates, ℔ sqr .... 3.00@ 4.50
Vermont:
Sea Green, ℔ sqr..... 2.70@ 3.20
Purple, ℔ sqr..... 3.50@ 4.50
Unfading Green, ℔ sqr..... 3.50@ 4.00
Red, ℔ sqr..... 9.75@12.00

Solder and Soldering Fluids—

Solder—

½ & ½ (Guaranteed)..... 13½@14½¢
No. 1..... 11¾@12 ¢
Prices of Solder indicated by private brands vary according to composition.

Soldering Fluids—

Concentrated Soldering Flux.
f.o.b. New York.
In barrels, ℔ ℔.....4¢
Smaller quantities, ℔ ℔.....5¢

Gedney's Soldering Fluid.
In carboys or barrels, ℔ ℔.....2¢
$1.50 for carboy or barrel; money refunded when returned.

Perfection Soldering Flux.
No charge for package.
5 & 10 lb. tins, about 500 ℔, ℔ ℔.....3½¢
5 gal. cans, about 300 ℔, ℔ ℔.....4¢
Kegs, about 110 ℔, ℔ ℔.....4¢
75¢ extra for keg.

Yager's Soldering Salts.
2-℔ bottles, each.....30¢
Large quantities, per ℔.....40¢

Spelter—

Western Spelter..... .....4¾¢@5¢
Bertha ....

Spiral Pipe—See *Pipe, Spiral.*

Stove-Pipe Elbows—*See Elbows, Stove Pipe.*

Stove Polish—See *Polish, Stove.*

Stove Trucks—See *Trucks, Stove.*

Strainers Conductor—

Galvanized.....60%

Tin, Pigs and Bars—

Banca, pigs, ℔ ℔ ....21½¢
Straits, pigs, ℔ ℔..... .....21¢
Straits in bars, ℔ ℔..... .....22¢

Tin Plates—

American Terne Plates—

Apollo Roofing.
IC, 14 x 20.....$6.25
IC, 20 x 28..... .....12.50
IX, 14 x 20..... .....7.25
IX, 20 x 28..... .....14.50

Buckeye.
IC, 14 x 20.....$7.00
IC, 20 x 28..... .....14.00
IX, 14 x 20..... .....8.25
IX, 20 x 28 ... .16.50
IXX, 14 x 20..... .....9.50
IXX, 20 x 28.....19.00

De Mill's.
First New York, IC, 14 x 20.....$5.75
" " " IC, 20 x 28 .....11.50
First New Jersey, IC, 14 x 20..... 5.75
" " " IC, 20 x 28.....11.50
Manhattan, IC, 14 x 20 ..... 7.00
" IC, 20 x 28 ....14.50

Dunlap's.
Double Dipped, IC, 14 x 20.....$8.25
" " IC, 20 x 28 .....16.50
" " IX, 14 x 20 ..... 9.50
" " IX, 20 x 28 .....19.00
Domestic, IC, 20 x 28 ....12.00
" IX, 20 x 28.....15.00

Glendale Tin Plate Co.
Optimus, Best Redipped, IC, 14 x 20..$8.25
" " " IC, 20 x 28.16.50
" " " IX, 14 x 20. 9.75
" " " IX, 20 x 28.19.50
N. F., Old Style, IC, 14 x 20 ..... 7.50
" " " IC, 20 x 28 .... 15.00
" " " IX, 14 x 20 ..... 9.00
" " " IX, 20 x 28..... 18.00
Bonus, Extra Coated, IC, 14 x 20... 6.75
" " " IC, 14 x 20... 8.25
" " " IC, 20 x 28...13.50
" " " IX, 20 x 28...16.50

Gummey, Spering & Co.

	14 x 20	20 x 28
IC Terne, Pennsyl Old Method, Treble Coated	$8.50	$16.75
IC Terne, Leominster, Extra coated	7.75	15.00
IC Terne, Waldo, Redipped	7.25	14.00
IC Terne, Alderly, Extra quality	6.37½	12.50
IC Terne, Phoenix	5.80	11.50
IC " Climax	5.70	11.25
IC " Venux	5.60	11.00
IC " Flag	5.50	10.50

Hamilton's.
Hamilton's Best Redip'd, IC, 14x20 $9.25
" " " IC, 20x28 18.50
" " " IX, 14x20 10.75
" " " IX. 20x28 21.50
Osceola Hand Coated, IC, 14x20 8.25
" " " IC, 20x28 16.50
" " " IX, 14x20 9.75
" " " IX, 20x28 19.50
Lula Best Charcoal, IC, 20x28 12.50
" " " IX. 20x28 16.00

Laufman's.
Apollo, IC (Resquared), 14 x 20.....$8.12
Apollo, IX (Resquared), 14 x 20..... 9.37
Apollo, IC (Resquared), 20 x 28.....16.00
Apollo, IX (Resquared), 20 x 28.....18.50
Apollo, IC (Resquared), 20 x 56.....16.00
Apollo, IX (Resquared), 20 x 56.....18.50
Tip Top, IC (Resquared), 14 x 20.... 6.62
Tip Top, IX (Resquared), 14 x 20.... 7.88
Tip Top, IC (Resquared), 20 x 28....13.00
Tip Top, IX (Resquared), 20 x 28....15.50
Allegheny, IC, 14 x 20..... 6.12
Allegheny, IX, 14 x 20..... 6.38
Allegheny, IC, 20 x 28.....12.00
Allegheny, IX, 20 x 28 .....12.50

McKinley Tin Plate Co.
McKinley:
IC, 20 x 28 ....$12.00
IX, 20 x 28 ....15.00
Fort Pitt
IC, 20 x 28 ... ... $11 00
Chicago:
I. 20 x 28 ....11.50
Wilkinsburg Redipped:
IC, 20 x 28 ....$16.00
IX, 20 x 28 ....19.00

Merchant's.—All Stamped
Crescent, IC, 20 x 28.....$12.00
Crescent, IC, 14 x 20..... 6.00
Hickory, IC, 20 x 28 (Resquared).. 12.75
Hickory, IC, 14 x 20 (Resquared)...6.37½
Empire, IC, 20 x 28..... 12.25
Empire, IC, 14 x 20.....6.12½
Alaska, IC, 20 x 28 (Resquared).... 14.00
Alaska, IC, 14 x 20 (Resquared).... 7.00
Merchant's Roofing, IC, 20 x 28 (Resquared)..... 17.00
Merchant's Roofing, IC, 14 x 20 (Resquared)..... 8.50
Merchant's Old Method, IC, 20 x 28 Resquared)..... 19.00
Merchant's Old Method, IC, 14 x 20 (Resquared) 9.50

Merry's.
Lion, IC, 14 x 20.....$5.25
IC, 20 x 28..... 10.50

Pittsburgh Tin-Plate Works.
Kensington:
IC, 14 x 20 ..... $6.75
IC, 20 x 28..... 13.50
IX, 14 x 20..... 8.00
IX, 20 x 28 ..... 16.00
Westmoreland:
IC, 14 x 20 ..... $6.25
IC, 20 x 28..... 12.50
Juno:
IC, 14 x 20..... $5.75
IC, 20 x 28 .... 11.50

Scott's.—All Stamped.
Scott's Extra Coated, IC, 14 x 20 (Resquared) $9.25
Scott's Extra Coated, IX, 14 x 20 (Resquared) 10.75
Scott's Extra Coated, IC, 20 x 28 (Resquared)..... .....18.50
Scott's Extra Coated, IX, 20 x 28 (Resquared)..... .....21.50
Neville, IC, 14 x 20 .... 6.00
" IX, 14 x 20..... 7.25
" IC, 20 x 28..... .....12.00
" IX, 20 x 28 ....14.00

N. & G. Taylor Co.'s.
Taylor, Old Style, IC, 14 x 20 (Stamped and Resquared)..... $9.25
Taylor Old Style, IC, 20 x 28 (Stamped and Resquared)..... 18.50
Taylor Roofing, IC, 14 x 20 (Stamped and Resquared)..... 8.00
Taylor Roofing, IC, 20 x 28 (Stamped and Resquared)..... 16.00
Columbia, IC, 14 x 20 (Stamped)... 7.00
Columbia, IC, 20 x 28 (Stamped)... 14.00
Maple, IC, 14 x 20 (Stamped)..... 6.50
Maple, IC, 20 x 28 (Stamped)..... 13.00
Willow, IC, 14 x 20..... 6.25
Willow, IC, 20 x 28..... 12.50
Knoxall, IC, 14 x 20 ..... 6.00
" IC, 20 x 28..... ..... 12.00
Globe, IC, 14 x 20..... 5.75
Globe, IC, 20 x 28..... 11.50

A. A. Thompson & Co.'s.
Old Colony, IC, 14 x 20.....$8.00
" " IC, 20 x 28.....16.00
Thompson's Puritan, IC, 14 x 20.....5.7
" " IC, 20 x 28....11.50
Durham, IC, 14 x 20.....5.75
" IC, 20 x 28.....11.50
Central, IC, 14 x 20..... 5.45
" IC, 20 x 28.....10.75
" WC, 14 x 20..... 5.25
" WC, 20 x 28.....10.25
Tarn, IC, 20 x 28.....10.50

U. S. Brands.—All Stamped,
U. S. Monongahela, IC, 14 x 20.....$6.50
U. S. Redipped, IC, 14 x 20..... 9.25
20 x 28 double the price of 14 x 20

American Bright Plates—

Continental Tin Plate Works.

	"Phoenix" extra.	Climax
IC, 14 x 20, Bright	$6.50	$6.25
IX, " "	8.00	7.75

All sizes and thicknesses, etc.

Merchant's.
Merchant's Dipped, IC, 14x20.....$11.00
Palma Xtra, IC, 1-x20.....7.25
Florence, IC, 14x20.....6.75

N. & G. Taylor Co.'s.
Brilliant, Tissue Packed, IC, 14x20..$9.00
Royal, extra, IC, 14x20.....7.00
Merlon, IC, 14x20.....6.75
Linden, IC, 14x20.....6.50
Almond, IC, 14x20.....6.25
Mint, IC, 14x20.....6.00

U. S.
IC, 14x20.....$7.25
IC, 20x28.....14.50

Imported Terne Plates—

Charcoal.
Dean Grade.—IC, 14 x 20.....@$5.50
" 20 x 28.....@11.00
" IX, 14 x 20.....@ 6.75
" 20 x 28.....@13.50
Abercarne Grade.—IC, 14 x 20.....@ 5.40
" 20 x 28.....@10.80
" IX, 14 x 20...@ 6.62½
" 20 x 28.....@13.25

Imported Bright Plates—

Charcoal.
Duty: 2.2¢ ℔ ℔.

Melyn and Calland Grade.	IC, 10 x 14	@$6.50
" "	IC, 12 x 12	@ 6.75
" "	IC, 14 x 20	@ 6.50
" "	IC, 20 x 28	@13.00
" "	IX, 10 x 14	@ 8.50
" "	IX, 12 x 12	@ 8.75
" "	IX, 14 x 20	@ 8.50
" "	IX, 20 x 28	@17.00
" "	DC, 12½ x 17	@ 6.00
" "	DX, 12½ x 17	@ 8.00
Allaway Grade.	IC, 10 x 14	@ 6.00
" "	IC, 12 x 12	@ 6.25
" "	IC, 14 x 20	@ 6.00
" "	IC, 20 x 28	@12.00
" "	IX, 10 x 14	@ 7.50
" "	IX, 12 x 12	@ 7.75
" "	IX, 14 x 20	@ 7.50
" "	IX, 20 x 28	@15.00
" "	DC, 12½ x 17	@ 5.50
" "	DX, 12½ x 17	@ 7.00

Coke.
Steel Coke.—IC, 10x14, 14x20..$5.40@$5.50
10x20.....@ 8.50
20x28..11.50@12.00
IX, 10x14, 14x20.....@ 6.75
B. V. Grade.—IC, 10x14, 14x20.....@ 5.5(

Imported Boiler Plates.—

IXX, 14x26..(112 sheets)..... ..@$13.35
IXX, 14x28..(112 sheets)..... ..@ 14.50
IXX, 14x31..(112 sheets)..... ..@ 16.00

Tinning—

Brass and Copper.....net

Tubing—

Tin.....55%
Galvanized.....55%

Troughs, Eave—See *Eave Troughs.*

Trucks Stove—

Improved Lock Frame, per doz....$15.00
Steel Lock Frame, per doz..... 18.00

Brass and Copper.—

Standard List.....30@35%

Zinc—

600 ℔ casks.....6¼¢
Per ℔.....7¢

News and Notes.

The Austrian Board of Trade report for the year 1892 shows the exports from that country to have been $275,691,600, and the imports $238,963,200; leaving a balance in favor of the monarchy of $36,728,400, which is little more than half that of the preceding year. The year 1892 was, however, generally one of reduced production and sale.

In view of the tariff war between Germany and Russia, which appears likely to close the markets of the former to Caucasian grain, it is interesting to find that the United States is the principal grain supplier of the Fatherland, Russia coming first in barley only. The German grain imports from the two countries during 1892 were as follows:

	Wheat. Tons.	Rye. Tons.	Barley. Tons.
From United States	620,213	136,129	10,293
From Russia	257,339	123,387	177,075

The other contributing countries were Roumania, Argentina, Bulgaria, British East India, Austria and the Netherlands, but in much smaller quantities.

James H. Eckels, Comptroller of the Currency, in a letter to F. B. Baird, vice-president of the Buffalo Furnace Company, stated that, in his opinion, it would not be unlawful to use certified checks as currency, because such a course would involve a contract between the depositor and his creditor, and would be independent of the bank. "As understood, the proposition appears to involve a business contract between the depositors and their creditors, and in my opinion such transaction would not constitute a violation of Section 5183, as the checks will be issued by the depositors and not by the banks. As to a certification of such checks by national banks when drawn against deposits to credit of drawer, I can find no legal objection."

Between 1859 and 1889 India absorbed $561,600,000 in gold and $1,089,600,000 in silver, or $1,651,200,000 in all. What has become of the silver we do not exactly know, says the London *Spectator*, though it is certain that a great proportion of it is hoarded as fixed and visible wealth, but about the destination of the gold there is no doubt whatever. The people have got the whole of it in their own hands, for it is not in circulation, and are using it either in ornaments, kept, be it observed, to pawn in extremity, or as hoarded treasure in coin, such as lies under almost ever peasant's floor in the Punjaub and Eastern Bengal.

Charles D. Kellogg of the Charity Organization Society says that pauperism has for the past ten years increased in a far larger proportion than the population of New York, owing to the vast immigration of indigent aliens.

Business in the iron and steel trades was dead in Sweden during 1892, but hopes of new markets are indulged in from her exhibits at Chicago.

The executive and advisory councils at Honolulu have introduced an act vesting the crown lands of Hawaii in the provisional government and providing for their division and settlement.

LABOR EXCHANGE.

Notices under this heading of reasonable length are inserted free of charge. Only those relating to employment are admitted. Write distinctly on one side of paper only, and do not use postal cards.

HELP WANTED.

A good all-around TINSMITH; one with experience in furnace and plumbing work preferred; a steady job to a sober, competent and industrious man; give reference and state age and wages desired. A. J. Snow, Fulton, N. Y. Aug. 19

A reliable, temperate and competent TINSMITH for a steady job in a country town 35 miles from New York; one who is familiar with furnace work, can repair pumps and do the work common in a country tin shop; wages $2 a day. "Tin Shop," office of *The Metal Worker*, 96-102 Reade street, New York City. Aug. 19

A man who thoroughly understands the foundry business in all its branches; must have some capital; manufacturing only staple goods; good profit; splendid opportunity for live man. "Foundry," office of *The Metal Worker*, 96-102 Reade street, New York City. Aug. 19

A TINSMITH; one used to sheet iron work; must be temperate and honest. F. W. Strong, Dalton, Mass. Aug. 19

TINNER who understands all kinds of tin work, roofing of all kinds, sheet iron and furnace work; a steady job for the right man; state wages. A. & F. Rockhold, Hillsboro, Ohio. Aug. 19

A reliable, temperate TINSMITH who understands general jobbing, roofing, assortment work, and has some knowledge of plumbing and iron-pipe work; married man preferred; experience and reference must be given; steady work if competent. A. T. Skillman, Hightstown, N. J. Aug. 12

At once, a TIN ROOFER: one with some knowledge of shop work; young man preferred; one not afraid to work. "J. C. S. L." Box 262, Raleigh, N. C. Aug. 12

FOREMAN for foundry; a practical man on stove repair work and water backs; must understand handling of men, be sober, steady and honest; steady work to handy man; reference required; state salary expected. "J. M. W.," office of *The Metal Worker*, 96-102 Reade street, New York City. Aug. 12

At once, a first-class TINSMITH and PLUMBER, who is steady and industrious, having a good experience in each kind of work; steady employment to the right man; state wages. C. Taylor & Co., Sidney, N. Y. Aug. 12

STOVE SALESMEN for the States of Illinois and Iowa to sell a line of new and modern stoves on commission, which has been introduced in this territory; quality strictly first class and prices moderate; only those acquainted with the trade need answer. "Commission," office of *The Metal Worker*, 96-102 Reade street, New York City. Aug 12

A good PLUMBER, who understands hot-water heating; must be strictly temperate. S. Woodhead, 108 Main street, North Adams, Mass. Aug 12

SITUATIONS WANTED.

By a TINSMITH, 22 years of age, 7 years' experience, some knowledge of plumbing, speaks English and German, steady job desired, city or country. "O. E. F.," 216 E. Fourth street, New York City. Aug. 19

A position as SALESMAN by a man of 15 years' experience on the road selling hardware, thoroughly acquainted with shelf and heavy hardware, iron and tinners' stock. "Head," office of *The Metal Worker*, Fifth and Main streets, Cincinnati, Ohio. Aug. 19

A practical STEAM and HOT-WATER FITTER and SALESMAN desires to represent a manufacturer of some special goods in the heating or plumbing line for the States of Pennsylvania and New Jersey. "R. S.," Lock Box 1086, Philadelphia. Aug. 19

By a practical PLUMBER and STEAM and HOT-WATER FITTER; competent to draw plans and specifications, and do all work desired; situation preferred in a city from 10,000 to 15,000 inhabitants. Wilson, Box 619, Schenectady, N. Y. Aug 19

By a practical WOOD PATTERN MAKER, who is thoroughly conversant with furnace work, inside the shop and on the road, as estimator, having been employed in that capacity for 16 years. F. Aldridge, 405 East Eighty-eighth street, New York. Aug. 19

A man 45 years old, 12 years' experience in retail hardware and furniture store; can make myself useful at anything connected with hardware, stove, furniture or tin shop; can take charge of store and would like a position as clerk, or take charge of branch store; I am temperate; Western town preferred; I have a good position now, but I want a change of location; I am a married man; can give the best of references. Z. C. Strong, Oakland, Iowa. Aug. 19

An all-round TINSMITH and SHEET-IRON WORKER; good on furnace, fire place, heaters, roofing, iron pipe, pumps, and all general jobbing, wants steady job by the year in country or city. A. A. Clark, office of *The Metal Worker*, 96-102 Reade street, New York City. Aug. 19

By a PLUMBER and GAS FITTER in the West or South; married; temperate; willing to work; wages moderate. Henry W. Bauer, 469 West Congress street, Chicago, Ill. Aug. 19

Steady situation by a PLUMBER; good workman, sober and industrious, understands gas-fitting, hot-water heating and both city and country work; 14 years' experience. "Plumber," 19 Centre street, Yonkers, N. Y. Aug. 19

By a practical and experienced STOVE MOUNTER on bench, floor, drill or patterns; competent in handling men; can furnish good reference. "G. C.," Box 819, office of *The Metal Worker*, 96-102 Reade street, New York. Aug. 19

A first-class furnace and range workman, also used to all kinds of jobbing in city or country shop; tin roofing, pumps, &c., wants steady position now or by September 1; temperate; references. Geo. Anderson, Flushing, L. I. Aug. 19

A man with 18 years' experience in PLUMBING, STEAM and HOT-WATER HEATING trades, and can take charge of any kind of machinery; reference given. "U. S. G. F.," Middletown, Dauphin County, Pa. Aug. 19

A steady, sober, reliable TINNER desires a permanent situation by the year in some first-class shop; have had 22 years' experience at general jobbing, tin roofing, gutters and leaders, mounting stoves, making all kinds of pieced tinware and making milk cans, can do stove and furnace work, can make patterns, lay out work or take charge of a shop; can furnish best of reference, if necessary. "Tinner," care of F. M. Sanford, Litchfield, Conn. Aug 19

As SALESMAN in the hardware, stove and tin business by a young man with seven years' experience; five years as a practical tin and stove man; speaks English and Swedish; A1 references; steady and sober. "J. A. J.," 55 Park street, Rockland, Maine. Aug. 19

As TRAVELING SALESMAN for a reliable stove or tinware manufacturing company, by a young man 23 years old, with six years' experience as salesman in a first-class stove and tinware store; gilt edge recommendations. "G. P. D," 803 Dinwiddie street, Portsmouth, Va. Aug. 19

By a strictly temperate PLUMBER, one who understands all kinds of job tin work; used to estimating and handling men; would like permanent position; 15 years' experience. Box 466, Wellsville, N. Y Aug. 19

As SUPERINTENDENT for steam and hot-water heating firm, by man 35 years old; is capable of taking hold of any kind of work; has had over two years' experience as superintendent and over ten years as practical mechanic; is not afraid of work, and can furnish references as to competency and reliability. "J. H.," office of *The Metal Worker*, 59 Dearborn street, Chicago. Aug. 19

By a young man, 21 years of age, as SALESMAN in a retail hardware store; have had two years' experience; no bad habits, and can furnish references. Box 185, Nevada, Iowa. Aug 19

Permanent situation by a first-class TINNER, 18 years' experience at inside and outside work; married man; good habits. Box 599, Negaunee, Mich. Aug 19

A practical TINSMITH and TIN ROOFER, TIN and SHEET-IRON WORKER; 19 years' experience; city or country. H. Gold, 92 Essex street, New York City. Aug 19

By a TIN and SHEET-METAL WORKER, both in and outside; also hot-air heating in every particular; I have 12 years' experience; can furnish reference; will answer all letters. D. E. Mays, care Virginia Plumbing & Heating Company, Roanoke, Va. Aug. 19

By middle-aged man, situation as TRAVELING SALESMAN in New England States; has had large experience in furnaces, stoves, &c., and some in hot water and steam heating; will travel on salary or commission. "Heating," office of *The Metal Worker*, 96-102 Reade street, New York City. Aug. 19

By a young man, as PLUMBER; four years' experience in Pennsylvania; would like to be under instructions for another year or so; willing to work and will furnish own tools. Philip Masters, 2196 Second avenue, New York City. Aug. 19

By a young man thoroughly acquainted in stove line, a position to represent a good house on the road; can furnish excellent credentials as to ability. E. Laurence care Keller & Beebe, 129 Beekman street, New York City. Aug. 19

By a young man with six years' experience at plumbing, gas fitting and hot-water heating; steady job desired. "Plumber," 713½ Indiana street, Laport, Ind. Aug. 19

As SHIPPING CLERK, a young man who is well posted in all details, and would make himself generally useful; can give good references. L. Junior, care Keller & Beebe, 129 Beekman street, New York. Aug. 19

STOVE SALESMAN, thoroughly acquainted with trade in Ohio, Indiana and the South; moderate salary until value of services can be determined. J. A. Wilson, 1095 Woodlawn avenue, Cleveland, Ohio. Aug. 12

Two first-class JOURNEYMEN PLUMBERS would like to work in the South. "H. M.," office of *The Metal Worker*, 96-102 Reade street, New York. Aug. 12

By a practical STEAM and HOT-WATER FITTER, 24 years old and strictly sober and reliable, a steady situation, city or country. "A. L.," P. O. box 247, Webster, Mass. Aug. 12

A situation by a young man, 26, as BOOKKEEPER or TRAVELING SALESMAN; have had four years' experience as bookkeeper and one year as traveling salesman; have had experience in wholesale and retail hardware as clerk, bookkeeper and traveling salesman; best of references. B. D. Higgins, Sidney, Ohio. Aug. 12

A practical CORNICE MAKER, CUTTER and DRAFTSMAN; thoroughly understands the business in all branches; can do all kinds of hammer and raised work by hand and machine; has had experience as foreman; can handle help to best advantage; moderate salary "Practical," office of *The Metal Worker*, 96-102 Reade street, New York City. Aug 12

As MANAGER or SUPERINTENDENT of stove works; over 20 years' experience; understands the business in all its details from the office down. "S.," Box 812, office of *The Metal Worker*, 96-102 Reade street, New York City. Aug. 12

By a TINSMITH of 12 years' experience, with a good knowledge of plumbing and hot-water and steam fitting; 28 years of age; married; can furnish good reference; city preferred. A. J. Bouchey, 445 Second street, Troy, N. Y. Aug. 12

CORNICE CUTTER desires situation in cornice shop; 20 years' experience. "L. W.," office of *The Metal Worker*, 59 Dearborn street, Chicago, Ill. Aug. 12

By competent man, CORNICE MAKER, CUTTER or FOREMAN; good reference. "R. S. T.," office of *The Metal Worker*, 59 Dearborn street, Chicago. Aug. 12

STOVE MOUNTER wishes a position as inspector, foreman or at the bench or contract, East or West; positively first-class in all branches; late with the Michigan Stove Company; age 31 years. "Modern," office of *The Metal Worker*, 96-102 Reade street, New York City. Aug. 12

HARDWARE CLERK, 24 years old; having disposed of my wholesale and retail hardware business I would like to engage with some firm as manager or clerk. "Hardware Clerk," office of *The Metal Worker*, 96-102 Reade street, New York City. Aug 12

A first-class PLUMBER and GAS FITTER, having city and county experience, would like a steady situation with reliable firm; best of references given. Fred. Bowers, Lock Box 40, Lykens, Dauphin County, Pa. Aug 12

A position by a young man in a hardware, stove and tin shop; four years' experience; best of references E. L. Carr, 39-41 Main street, Clifton Springs, N. Y. Aug 12

As FOREMAN, by a first-class all-around stove mounter; best and quickest methods. "Western Driller," office of *The Metal Worker*, 96-102 Reade street, New York City. Aug. 12

By a TINSMITH and CORNICE MAKER, who can cut patterns and do hammering work. Charley J. Sander, Bowling Green, Ky. Aug. 12

As TRAVELING SALESMAN, by a practical job tinner of 20 years' experience, with some good jobbing, tin-plate or hardware house, or position as job tinner, or salesman in a hardware store; 43 years of age and temperate; Western New York territory preferred; at liberty now. J. E. Whitbeck, Phelps, N. Y. Aug. 12

One or two good reliable and industrious PLUMBERS would like a job in any part of the country. "Plumber," office of *The Metal Worker*, 96-102 Reade street, New York City. Aug. 12

As TINNER and SKYLIGHT and CORNICE MAKER; can work from drawings and hammering work. John Kylian, 1376 Avenue A, New York City. Aug. 12

By a young man 19 years of age with some good firm to learn plumbing and steam fitting; good habits and steady; can furnish first-class references. Samuel J. Christian, Box 125, Philmont, N. Y. Aug. 12

By a reliable German, 34 years of age, as CORNICE MAKER; good at plans, figures and cutting; New York or vicinity. "A. B.," Box 812, office of *The Metal Worker*, 96-102 Reade street, New York City. Aug. 12

A good TINSMITH, 19 years old, single; five years' experience; city or country. Philip Schapiro, care of Sonenschein, 128 Moore street, Brooklyn, N. Y. Aug. 12

A good TINSMITH, 20 years old, single; six years' experience; city or country. Ch. Friedmann, 154 Varet street, Brooklyn, N. Y. Aug. 12

By a young married man, 31 years old, speaks English and German, a steady job the year round as FOREMAN in tin shop and clerk in hardware store; am a first-class tinner and salesman, have had 18 years' experience as both; state wages when writing; can give gilt edge reference as to honesty, sobriety and capability. H. W. Kuehner, P. O. Box 24, Boonville, Mo. Aug 12

THE METAL WORKER.

NEW YORK AND CHICAGO.

Saturday, August 26, 1893.

DAVID WILLIAMS, - PUBLISHER

BUSINESS OFFICES:

NEW YORK.....96-102 Reade Street.
PHILADELPHIA.....220 South Fourth Street.
BOSTON.....146 Franklin Street.
PITTSBURGH..... Room 509 Hamilton Building.
CHICAGO.....59 Dearborn Street, cor. Randolph.
CINCINNATI.....Rooms 22-24 Pickering Building.
ST. LOUIS.....Bank of Commerce Building.
CLEVELAND.....312 The Cuyahoga.

BRITISH AGENCY: The Ironmonger, 42 Cannon street, London, England.

Public Works for the Unemployed.

So surely as times of industrial depression come about do labor agitators and unthinking people generally propose all sorts of impracticable schemes for the relief of the workingmen. Some of these suggestions are made in good faith and in the hope that the distress of the unemployed will be relieved; but others undoubtedly originate in the minds of agitators pure and simple, whose sole object is to foster discontent, that out of the trouble some good may come to them which were its instigators. One of the commonest propositions made in such times as these is that the Government assume a fatherly attitude toward the distressed and begin great public works for their employment. This illogical scheme of relief is often proposed and, it is to be regretted, not infrequently acted upon. It gives temporary relief through the distribution of wages to those who have no money. It delays, however, the renewal of general activity, for it is a method of forcing work when demand and supply and other industrial conditions do not warrant it. The Government has no money but such as it collects from the people, and to collect money from the people and then employ them is, as the phrase goes, "robbing Peter to pay Paul." The scheme is a plausible one, however, and many people, particularly among the unintelligent, are captivated by it and use every effort to forward it. To those who are poor and in need of wages for their daily bread it is excusable that this false hope should be relied upon and followed; but it is monstrous that the evil doctrine should be propagated by those who are, or should be, wise enough to know better. One who has obtained a good deal of publicity lately in the work of highway reform urges that Legislatures and municipal authorities take immediate steps to furnish employment in the construction of public works, more especially in improving the highways, and further urges that Congress, after the immediate demands of the session are complied with, pass bills making liberal appropriations for the irrigation of arid lands and other internal improvements. It is a gigantic scheme of paternalism that is outlined, and the originator, if politically ambitious, will undoubtedly rise in the estimation of a certain class of voters. The mischief done, however, by preaching wrong economics should not be forgotten even when one is looking for political preferment.

Imparting Knowledge

To a greater extent than is recognized or is reasonable, an impression exists that to tell a thing once is sufficient. It is natural after something is learned to regard it as simple, though a considerable effort has been necessary to master it thoroughly. Seeming so simple, some other person who is expected to understand it at once is told of it with a briefness that astonishes rather than enlightens. If, after the astonishment is overcome, enough information has been secured to arouse an interest and further inquiry is made, the answer is: "I told you all about it once." This illustrates the conviction, that once telling is enough, which prevails among some excellent people who have never studied the art and noted the result of teaching. That once telling is so utterly insufficient as to be almost useless is experienced at some expense daily in all lines of business. A list of goods is given a stock clerk, a lot of instructions are given a workman, or exhaustive explanations are given a mechanic, once for all, that make it a marvel that satisfactory results follow. Too often all concerned forget some detail, which in the end involve a serious expense and suggests that a more extended explanation be used instead of telling a thing once for all. In imparting information, sufficient time must be taken to make an impression on the mind and to effect a thorough understanding of the subject explained, if the knowledge is to be permanently retained. By carefully following such a plan in imparting information a greater number of the boys now learning trades will make valuable journeymen.

Fire Losses.

The record of fire losses in the United States for the first seven months of the present year points to a very serious condition of things in this field. Fires are shown to be increasing at an abnormal rate, despite the increased efficiency of the means taken for fighting them. It is an open secret that many, even among the strongest fire insurance corporations, are having a hard struggle for existence, and their profits are dwindling while risks increase. The rapid advance in values of property destroyed by fires is demonstrated in the official returns. During the past three years the annual loss has risen from $109,000,000 in 1890 to $152,000,000 in 1892, while the accounts for the seven months of the current year indicate that 1893 will in its turn surpass all previous records, barring the fatal year of the great Chicago fire. Each week brings with it the tale of some great conflagration. A few weeks ago it was in Fargo, then in Long Island City, and this week again we hear of a $2,000,000 blaze in Minneapolis. Indeed, the story has become such a familiar one to American citizens that, except to those directly interested, the fire news in the morning paper has become a weariness to the flesh in its constant reiteration. But, nevertheless, the menace to the prosperity of the country is a serious one, and one that deserves the grave attention of all thinking men.

Some Causes and Preventives.

What is the cause of this rapid increase in destruction by fire? The published opinions of a number of fire underwriters and other authorities on insurance, as expressed of late in the daily press, give two main causes, which are very interesting ones. According to them, the increase in fire losses is attributable to incendiarism, induced by the present financial stringency, and also to the increasing use of electricity in trolley, telephone and electric light and power wires. It is recorded that the latter agent has been directly responsible for the destruction of property during late years at a rapidly increasing rate. Statistics show that in 1885 the value of property destroyed by what is termed "electric fire" was only $250,000. In 1891 the amount had grown to $1,300,000, and in 1892 the cases footed up the large sum of $3,000,000. Besides these cases there were a number of fires put down to "unknown" causes, the origin of which was more than likely due to electricity. Most of these cases, too, were of a preventable nature, by the use of better insulation and greater precaution and care generally in the introduction and maintenance of the electric agent in buildings.

Home Fire Brigades.

Another very simple precaution, also, might have prevented the destruction of much valuable property in manufacturing establishments and stores—namely, the drilling of a portion of the employees as a fire brigade. The advantage of this plan was signally demonstrated lately in a fire in Chicago, when a great store was seriously threatened. The fire was, however, successfully held back by the firm's own brigade, which consisted of a captain and

our men to each of the seven floors of the building. The store had been, happily, equipped with all the necessary apparatus for fighting a fire and the men had been drilled every week in its use. Consequently, when the emergency came, they were found capable of saving the property. This system is followed in several large establishments in and near the city of New York, but its application might with advantage be much more widely extended, and it should be worth while for insurance companies to give more encouragement, by lower rates, to the establishment of similar home fire brigades in all places where large risks and valuable property are involved.

A Strike to Support Fraud.

An extraordinary strike is reported at the works of Clement & Co., who are large cycle makers in Paris, France. As a novelty in trade disputes it is worth recording. The origin of the strike was as follows: It was noticed lately that large thefts of material were being committed at the works, and the police discovered that the culprits were workmen employed at the factory. Several arrests were made, and in one case more than $400 worth of property was discovered in the thief's house. Five men whose offense was a trifling one were dismissed from custody, and re-employed by Messrs. Clement & Co., but action was taken against the remainder. This did not satisfy the rest of the workmen in the factory and they demanded that the whole of the charges should be withdrawn, and that all the culprits should be taken back. On the firm very properly refusing to accede to this request, the whole workshop, numbering 300 men, went out on strike. Messrs. Clement could not very well give way under the circumstances, for capitulation on their part would be equivalent to an admission of the right of the workmen to steal with impunity.

Members of the Boston trade are telling a good story on J. Sidney Smith of the St. Louis Stamping Company, which his friends find a little difficult to believe. It seems that a short time ago Mr. Smith visited the great fair at Chicago, and wandering about the grounds, encountered a person whom he had met casually while traveling. Delighted to see a familiar face, he rushed up with extended hand and cordial greeting, only to be met by a stony stare, followed by a knowing look and abrupt turning away of the party addressed, with the remark that he was not from Wayback and had been duly warned of bunco steerers. Any one who knows Mr. Smith can readily imagine his amazement. The story comes from a reliable source, but it is, nevertheless, somewhat difficult to credit, when taking into account Mr. Smith's eminently respectable appearance, on any other hypothesis than the well-known idea that a successful bunco man must of necessity be particularly smooth in both appearance and address.

In these dull times there is a great deal of monotony in the replies of manufacturers and dealers to well worn questions as to the present condition of business and future prospects. However, once in a while one hears something out of the ordinary rut, as, for instance, on Blackstone street, Boston, recently, one of the trade discussing the situation and making a guess at the future, remarked that the coming season would be an old-fashioned winter, and that, in a business sense, it was likely to snow in bed.

Prehistoric Steel Casting.

With our usual desire of keeping our readers informed of all that goes on, says *Industries and Iron*, we sent our metallurgist to represent us at a recent performance of "Siegfried." He reports that the art of casting steel is quite old, as it was known in prehistoric times. The only property left to Siegfried was a broken sword. This Mime, obviously a registered plumber, had failed to mend; so Siegfried, a non-union man, decided he would repair the article. Mime told him to solder it, as far as could be made out. As our readers are aware, "Siegfried" is the third volume of a four-volume opera, and as, according to the genius of the German language, the verbs all come at the end of the fourth volume, at whose performance we have not been represented, we cannot give accurate details as to the proposed method of soldering. Siegfried, however black his character in other ways, was no plumber, and as the sword was not for the British army, he refused to repair it with solder. He clamped the pieces in a 15-shilling vise, being unacquainted with the quick-gripping kinds, and filed it into "shreds," which shows the curious molecular structure of early cast steel. The prehistoric fitter holds a 14-inch rough-cut in one hand, and gives it a see-saw motion, while he waves the other hand above his head and sings lustily. Finally the shreds were put in a Battersea 5-pound crucible, which was perched on the top of a cool part of the fire. After being sung at for a little time the shreds succumbed and fused, and were poured into a mold resembling one of the cases in which fish slices for wedding presents are sold. The whole mold was then quenched in water and the finished blade taken out. Siegfried poked the fire with it, laid it on the anvil and hammered the anvil, producing sparks that must have made the lamps of the other consumers on the Metropolitan Electric Supply Company's circuit jump badly. The blade was now finished. If Siegfried had had any of the blood of the famous Ritter Kuno in his veins, he might have utilized the dragon's blood for tempering the sword, as Fafner's internals were at about 1000° C., and glowed through cracks in his sides. The sword finally cut the anvil clean in two, or would have done so if the anvil had not fallen in two before the sword was even raised, the catch having been released prematurely.

A new porcelain has been obtained in England from asbestos. The mineral is ground to a fine powder, and all soluble matters are dissolved with hydrochloric acid. The powder is then made into a paste with water and baked in a porcelain furnace for 18 hours at 1200° F.

An agreement has been signed by the Pacific Mail Steamship Company and the Panama Railroad Company whereby the former charter to the railroad company their three ships running between New York and Cuba.

HEATING AND PLUMBING.

NEW WORK AND CONTRACTS.

WILEY & CALHOUN of Portland, Maine, have been awarded the contract for heating the new Masonic Building and the Fletcher Block in Camden, Maine.

AMONG the improvements to be made at the Grace Church, Oswego, N. Y., is a new steam-heating apparatus.

THE County Court of Memphis, Tenn., is receiving bids for repairing the Court House, which will include a new steam-heating plant.

RUFE BROS. of Doylestown, Pa., have been awarded the contract for heating St. Alphonsus' Parochial School and Convent at Philadelphia, Pa.

FRED STOYLE of Houghton, Mich., has secured the contract for the plumbing at the new Lloyd House at L'Anse.

STREVEIL & BESORE, Miles City, Mon., have secured the contract for heating and ventilating the Montana State Reform School. They will use the system of the Bennett & Peck Heating & Ventilating Company, Cincinnati, Ohio.

GOOD TRADE is reported by the Bennett & Peck Heating & Ventilating Company, Cincinnati, Ohio. Among the contracts that have been awarded to them are the school building at College Hill, Ohio; building for the Board of County Commissioners at Dayton, Ohio; school building at Carrollton, Ohio; Jackson County Court House at Brownston, Ind.; school building at Lynchburg, Va., and two school buildings at Gainesville, Texas.

AFTER an animated discussion before the school inspectors of Detroit, Mich., the system of heating the new Central High School Building submitted by the Huyett & Smith Mfg. Company of Detroit was selected and the contract awarded at a reported price of $24,100.

R. BARNEY has been awarded the plumbing contract for placing 18 new closets in the Division Street School and 17 in the High Street School at Ishpeming, Mich.

NEW steam heating apparatus is soon to be placed in the library building at West Brookfield, Mass.

THE city of Westfield, Mass., regard the Fuller & Warren system of heating and ventilating put in the Union Street School house as the most important change made in any of the school houses this year.

GEO. D. HOFFMAN, 82 Lake Street, Chicago, is placing a 25 horse-power boiler in the basement under his sales room to furnish power for electric light plant, pipe cutting machines, and for heating purposes. He has recently contracted to furnish two Economy warm-air heaters for the school building as North Dixon, Ill.; one for the residence of Geo. Wood, Prairie avenue, Chicago, and one for the residence of Mrs. F. M. Snow, Longwood, Ill. Among the contracts recently taken for steam heating can be mentioned the Post Office building at Englewood, Ill.; residence of O. M. Hagen, Wellington avenue, Chicago; apartment building of H. Murphy, Indianapolis, Ind.

THE officers of the Congregational church at Kenosha, Wis., have decided to put a new heating apparatus in the church. It is understood that the hot-water system is to be introduced.

TIN PLATES.

Closing of Welsh Tin-Plate Works.

Latest advices from England announce that Morewood & Co. have posted notices at their great tin-plate works at Swansea and Llanelly, Wales, terminating contracts with their employees in 28 days. The reasons given are variously stated as uncertainty of coal supplies, in view of the great strike of coal miners, scarcity of orders, &c. The firm, however, have assigned no reason for their action. In regard to the matter the *Western Mail* of Cardiff, Wales, has the following remarks :

It is easy to understand the uneasy feeling created throughout South Wales by the sudden and quite unexpected month's notice given to all their employees by Messrs. E. Morewood & Co., the largest tin-plate makers in the world. It affects directly 3000 workmen, or something like 18,000 persons, taking the families of the workmen into account. The great cause of the uneasiness excited by the notices is not the temporary stop which is likely to follow, bad as that will be, but the fear of worse things to come.

Messrs. Morewood & Co. assigned no reason. But at Llanelly, at Burry Port and at Cwmbwrla there are disquieting rumors. Those who look only at the bright side are saying that the notice is only a precaution rendered necessary by the gigantic coal crisis upon which the country is entering. Others think if that were the only reason the great firm would have said so in one way or the other.

But deeper speculators point to the undoubted fact that the United States of America are the best customers of Welsh tin-plate works, and that the financial difficulties which are playing such havoc with American trade and commerce must naturally affect sooner or later the American demand for Welsh tin plates. To some extent this surmise must be more or less true.

The great dread at Llanelly and throughout South Wales, if it were honestly voiced, is that the new works of E. Morewood & Co., at Port Elizabeth (Elizabethport) and Indianapolis, have the chief part in the notices given to the firm's Welsh employees. It is not well to meet trouble half way, and in this case there is no need as yet.

SCRAP.

THE GENERAL STRIKE of coal miners in Great Britain will bear hardly upon the Welsh tin-plate works and rolling mills in causing scarcity of fuel and advance in its price. Writing under date of August 12, the Swansea correspondent of *Ryland's Iron Trade Circular* of Birmingham reports as follows: "A great many of the tin-plate makers stated to-day that, even without any advance in the price of coal, they would be better off if they stopped, as the present price of tin plates is considerably below the cost of make, while the demand seems to go from bad to worse, with very little prospect of any immediate improvement. Some recent sales are said to have been made at extremely low figures, but we are unable to obtain correct information upon the point, but it was hinted that something like 10 shillings 6 pence basis had been accepted, and it is questioned whether plates can be manufactured at anything like this figure; therefore, a greater increase in fuel will bring about a climax such as the manufacturers will have no hesitation in stopping their works as the only remedy open to them."

BRITISH BOARD OF TRADE RETURNS for July, 1893, give the exports of tin plates and sheets to the United States as 22,248 tons, a falling off of 2500 tons from the figures for the corresponding month of last year. The tin-plate shipments to this country for the first seven months of the year are given as 182,668 tons, valued at $11,331,450. Total exports of this material from Great Brtiain show for July an increase of 7.2 per cent. over those of July, 1892; augmented shipments to Russia and other countries more than compensating for the falling off in exports to the United States.

A PRESS DISPATCH from Milwaukee, Wis., dated August 19, said: "The Collector of the Port of Milwaukee was to-day obliged to store large quantities of tin plate because the importers do not come forward and pay the duties. The duties on that now in store at this point amount to about $35,000. The reason assigned by the heaviest importer for the accumulation is, that Congress is sure to take the added duty off tin plate soon, and if he holds on until that time he will get rebate equal to the reduction, which will amount on the present lot to about $10,000."

IT IS REPORTED that the output of tin from the Malay Peninsula will be largely increased this year.

THE AMERICAN TIN PLATE COMPANY, Elwood, Ind., experienced lately some difficulty with their Welsh tin platers, which has, however, been satisfactorily adjusted. The trouble is said to have been caused over the operation of the automatic tinning machines, the operators employed on the machines demanding to be paid skilled labor wages, and this demand being refused by the firm.

THE WORKS of the United States Iron & Tin Plate Mfg. Company, Demmler, Pa., have started up again after a close down of some weeks. The departments put into operation are two furnaces, one sheet mill, three tin mills and four stacks. Three hundred men are in employment, including skilled mechanics and laborers.

FALCON TIN PLATE & SHEET COMPANY, Niles, Ohio, have been rolling some excellent specimens of sheet steel for high-grade tin and terne plating. This special assortment of samples was prepared with a view to their being subjected to the severest test by an old established importing house who during the past year or so have been tinning their own plates. The sheets were smooth and very creditable in appearance. It is the desire of the Falcon Company to have them critically tested for weaknesses, if there are any. George H. Ismon, 277 Broadway, New York, is the sales agent.

A ST. LOUIS DISPATCH of August 21 announces that the works of the St. Louis Stamping Company, which have been idle for nearly two months, will resume operations on Monday. The tin-plate plant will start up at the same time.

THE PONTARDAWE TIN PLATE WORKS of Gilbertson & Co. have lost 200 men in the tinhouse department by a strike ordered by the officials of the Tin Plate Workers' Union of Wales. The steel works and mills belonging to Messrs. Gilbertson were still in operation by last accounts, but it is believed the owners will have to close them, throwing 500 men out of employment. The dispute is regarded as the more lamentable that for 34 years there has been the best feeling between employers and employed at the Pontardawe works, and work has gone on uninterruptedly for the whole of that period.

THE SCHEDULES in the assignment of N. L. Cort & Co., importers and dealers in tin plates, 245 and 247 Water street, New York, who recently assigned to Frederick G. Dow, show liabilities $377,062.58; nominal assets $354,333.49; and actual assets $348,434.92.

OWING TO SCARCITY of orders, and the coal difficulty in Wales, the Morfa Tin Plate Works of Tregonning & Son, at Llanelly, were closed down last week, and 600 workpeople were thrown out of employment. According to a cable dispatch of Thursday last, the example of this firm, and of the Morewoods, has been followed by a majority of the South Wales tin-plate works.

The regular monthly meeting of the Western Foundrymen's Association should have been held in Chicago on the evening of the 16th inst., but the attendance was so small that an adjournment was taken until September 20. An effort will be made to arrange to hold this meeting in the rooms of the Associated Engineering Societies, at the World's Fair. The topics to be discussed are those intented for the meeting of last week.

A Pacific Coast journal states that 27 canneries are packing salmon on the Fraser River this year, and 1325 boats are at work. The fish are said to be running in immense numbers, and prospects were never better than at present. The canneries cannot handle the quantities of fish supplied them, though some of them are packing 1500 cases daily.

Barbed-wire fences will no longer be allowed in England in roads, lanes or other thoroughfares, according to a bill recently passed through the British House of Commons. The bill empowers the removal of any such fences after due notice served.

THE LETTER BOX.

Tin Importations.

From SUBSCRIBER, *Columbia City, Ind.*—Please inform me what amount of foreign tin was used in the United States in the years ending June 30, 1892, 1891, 1890 and 1889? I noted the figures given in *The Metal Worker* for the year 1893 and wish to compare them with former years.

Answer.—We have not the statistics of consumption and stocks on hand during the preceding years, but a comparison between the total importations of tin will probably answer our correspondent's requirements. For the sake of comparison we reprint the total importations of tin for the year ending June 30, 1893, in connection with the other years:

	Pounds.
Year ending June 30, 1893	61,076,464
Year ending June 30, 1892	43,908,652
Year ending June 30, 1891	39,787,622
Year ending June 30, 1890	34,993,099
Year ending June 30, 1889	33,877,287

Trouble With a Well Cooler.

From J. W. B., *Brockton, Mass.*—I notice in *The Metal Worker* of August 19 that "E. D. S.," Atlanta, Ga., has endeavored to rectify the mistake of "P. R. F." in arranging a water cooler and advises that the inlet should be on the upper side of the boiler or cooler and the discharge taken from the underside. I think, however, he would have the same trouble in Fig. 1 or Fig. 3 as did "P. R. F." With the tank filling from the top side, what would become of the air after the discharge pipe becomes filled, on a level with the water in the tank? It seems to me it is going to remain there. If he will just reverse his connections he will have his cooler filled with water without the cooler being partly filled with air. As the air is the lightest it will rise to the upper side, and as the water takes possession, beginning at the lowest point, the air will make its escape through the discharge pipe.

Preventing Tin Roofs from Rusting.

From A. & N., *Waterloo, N. Y.*—What is the best thing to do to prevent tin roofs from rusting on the under side? We are aware that painting the tin before it is laid is considered a good preventive, but is there not a better and more effectual way? Is it a good plan to lay sheathing that is impervious to moisture under tin?

Answer.—It must be evident that the rusting of tin roofs on the under side is caused by the moisture from below condensing on the under side of the tin. This condensation is liable to take place when the warm air below is charged with moisture and the external air is at a low temperature. By painting the under side of the tin it is protected from the moisture, providing the entire surface of the tin is covered with paint. By placing a water-proof paper between the roof boards and tin, it is probable that much of the moisture will be prevented from reaching the tin. Another method that might be suggested, and one that has been found effectual under various conditions, is to ventilate the space between ceiling and roof, thus allowing the moisture to escape.

Tapering Furnace Pipe.

From W. B. S., *Boston.*—I note in your issue of August 12 a question by "J. F. T." regarding taper furnace pipe. As you intimate in your note, this is a question that can only be settled experimentally and by practical experience. Some reasonable deductions can, however, be made from a theoretical standpoint. It is true, as you state, that with the pipe, as specified, tapering from 12 inches to 9 inches, all of the air must pass through the 9-inch aperture. This is then a measure of the volume but not of the weight, and while the cooling effect due to passing 12 feet through the pipe would be slight, yet it would be such as to increase the density—*i. e.*, the weight per cubic foot—as the pipe receded from the furnace. It would therefore seem best for this reason to place the smallest end where the air is most dense—that is, furthest from the furnace. But as the freedom of exit from the furnace depends on the increased area into which the air flows, this condition is, on the other hand, only to be found where the small end of the pipe is at the furnace. As the heated air rises within the furnace casing, its velocity is sufficient to give it considerable momentum, tending to actually throw it into any opening that may be presented. The relative location of openings must have much to do with the resulting action of this moving air, but under equal conditions the tendency would be to throw the greatest volume through the pipe when the 12-inch end is presented rather than when the 9-inch end receives the air. As the loss of heat from the pipe is proportional to the difference in temperature between the air within and that without, the most rapid cooling would take place nearest the furnace. If the large end of the pipe is at the furnace the larger area of pipe surface (due to its greater diameter), coupled with the higher temperature, will allow the loss of heat per foot of length of pipe to be more rapid than if the pipe were reversed. For by this arrangement of larger end at the furnace both the difference in temperature and the radiating surface decrease as we recede from the furnace. This results in denser air at the 9-inch end and hence a greater air movement. The loss by friction must be slight, but as it varies with the square of the velocity, the greatest loss must occur where the greatest volume is passing through the pipe. It would thus seem from the deductions here made that the greatest discharge would result with the larger end at the furnace, but as the heat units admitted to the room are the true measure of the efficiency and as one of the results of this arrangement would appear to be the discharge of cooler air even if of larger volume, it must be acknowledged that the whole question seems to be one of such fine calculation as to indicate that no practical difference in the results would be obtained whichever way the pipe may be placed.

Nailing Sheets on a Flat-Seam Roof.

From F. R., *Meriden, Conn.*—Please decide through the columns of *The Metal Worker* which of the two ways shown in the sketches is correct for

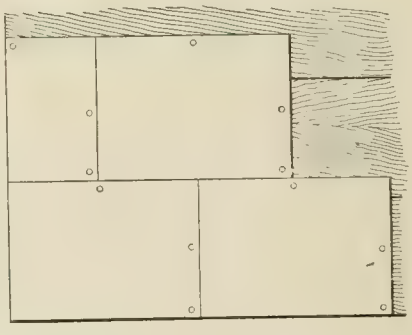


Fig. 1.—Nail in Middle.

placing nails in 14 x 20 inch tin on a flat-seam roof. Only three nails are to be used for each sheet. Would it be preferable to fasten the tin at the middle of the sheets, as shown in Fig. 1, or at the corners, as shown in Fig. 2?

Answer.—The method of nailing shown in Fig. 2 we regard as the better one when but three nails are used

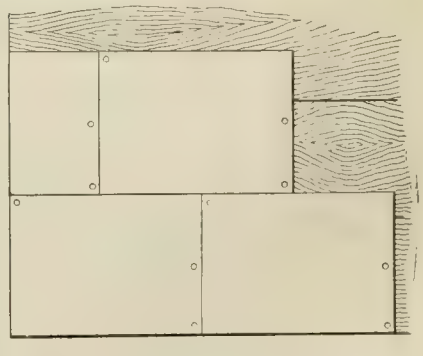


Fig. 2.—Nail at Corner.

for each sheet. If nails are driven at points as shown in Fig. 1 it is evident that they only serve to hold down the sheets properly at those points, leaving the entire length of the lock between the cross seams without any fastening but that afforded by the lock itself. On the other hand, nailing the sheets as shown in Fig. 2 fastens them firmly to the roof and tends to distribute the nails to better advantage around the edges of the sheets.

Brazing Small Articles.

From H. O. D., *Easton, Pa.*—I would like to be informed how small brass pipes and ornaments are brazed.

Answer.—Brazing, or hard soldering, consists of uniting metals by means of solder that is almost as hard as the metals to be joined. Thus brass is brazed by means of spelter solder or silver. The work to be joined is prepared by filing or scraping so the edges will be perfectly clean, when the parts are put in proper position and secured together by means of binding wire or clamps. The granulated solder and powdered borax are mixed in a dish with a little water and spread along the joint, using a V-shaped strip of metal or a small spoon for the purpose. If the work is of suitable shape it can be heated gradually over a clear fire until the water used for mixing the solder and borax is evaporated, and when the borax becomes dry the heat can be increased until the borax and solder fuse. The borax first melts and runs along the work like glass, and upon the application of more heat the solder also melts and should fill the joint. When spelter solder is used the point of fusion is indicated by a small flame caused by the burning of the zinc. If the work is of small size, it can be secured to a piece of charcoal by means of wires, and the heat applied by using a lamp or gas jet and the ordinary blowpipe. Another kind of support for the work can be made by taking a piece of sheet iron 4 or 5 inches in diameter and bent up at the edges so as to form a pan about ⅜ inch deep. This pan is to be filled with a matting formed of pieces of binding wire, or a number of layers of fine wire cloth. The work to be brazed is laid on the matting, which becomes heated from the flame but does not burn away like charcoal. If a pipe is to be made, the metal is formed to shape and bound with wire. A V-shaped strip of metal is then filled with the spelter solder and borax, run in the pipe and turned over, thus placing the spelter over the joint. The pipe can then be brazed by holding over a clear fire until the spelter melts, the pipe being drawn along until the seam is completed. For the brazing of larger work than can be done by means of the ordinary blowpipe, it is usual to employ one using illuminating gas and air. This form of blowpipe requires about one part of gas to eight of air. Two tubes are used, one within the other, the smaller for gas and the larger for air and provided with stop cocks for regulating the supply of each, so a clear blue flame will be the result. Rubber hose is attached to each tube and connected with the gas and air supply, the latter usually being furnished by means of a blower. A sheet-iron pan is to be partly filled with coke, on which a few pieces of charcoal are laid, when the blowpipe can be used to ignite the charcoal. The work is then laid on the charcoal and the flame of the blowpipe is brought against the work until the spelter melts. By placing the work on the ignited charcoal heat is applied below, which helps to melt the spelter and causes it to flow through the joint.

Sheet-Metal Trade School.

From T. C. G., *Newark, N. J.*—Is there in New York or its vicinity a tinsmiths' or sheet-iron workers' trade school?

Answer.—We regret to say that, so far as we know, the pattern-cutting trade is not taught in any of the trade or manual schools in this vicinity. It is a very important branch, and we know that attempts have been made in other places to introduce it as a special course, but heretofore without success. We think there is an excellent opportunity for work of this sort in connection with trade schools, and we know from inquiries received that there are many young men who are desirous of learning the art of pattern cutting in this way. If any of our readers know of a place where this instruction can be obtained we shall be glad to receive the information.

Plumbago.

From E. D. S., *Newman, Cal.*—Please tell me in *The Metal Worker* the price paid for plumbago in its raw state. What is it used for besides foundry facing and axle grease?

Answer.—The price paid for plumbago varies from a small fraction of a cent per pound for the common article for which there is very little market, to less than 2 cents for the high-grade article. One way of testing its quality would be to grind it so that the dirt could be separated by being thrown in running water, the pure plumbago floating off. Plumbago is used in many articles and trades, a few of which are crucibles, paint, stove polish, lubricants and electrical goods, but in all a high grade is sought.

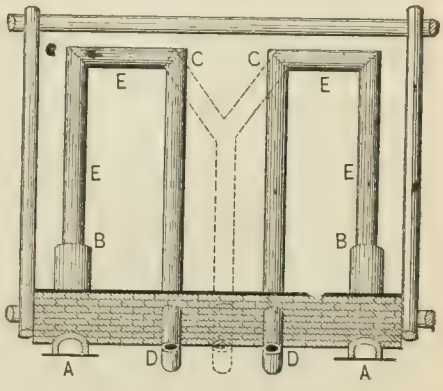
Tobacco Drying Apparatus.

We are indebted to A. C. Vandiver of the Agricultural Experiment Station at Columbia, Mo., for a pamphlet on tobacco by Major R. L. Ragland of Henry County, Va., sent in answer to the inquiry of "T. A. S.," Nashville, Tenn., in *The Metal Worker* of August 5. We give the following extract on "Flues and Flue Curing:"

Flues have almost entirely superseded charcoal for curing yellow tobacco, as being cheaper and better every way. The heat is more readily controlled by the use of flues—an important item in successful curing—and the tobacco cured therewith is cleaner, brighter and sweeter than that cured with charcoal. The flue is, moreover, the best mode of applying heat in the curing process of any type of tobacco requiring the application of artificial heat, and may be used to good advantage in drying out and seasoning those types cured mainly by sun and air and preserving them from injury. Its use is fast superseding the open wood fire with its objectionable smoke. The following cut represents the furnace-and-pipe flue more extensively used and is not patented. It is cheap and reliable, easily constructed and controlled, safe and may be relied upon to work well: Cut out two or three logs from the end of the barn, as represented by the brick work; then construct two furnaces, A B and A B, with brick or stone, as follows: Let the mouths of the furnaces A A project 15 inches outward beyond the wall—the cut fails to show the projection properly—and extend the furnaces to B B about 5½ or 6 feet. The outer wall of the furnaces should be about 15 inches distant from the logs or sills of the barn. Build the walls of the furnaces 18 inches apart and 18 inches high at A A, running back to 14 inches high at B B, and let the bottom of the flues slope upward from 4 to 5 inches from A A to B B. The furnaces should be arched with brick or covered with fire-proof stone, or No. 16 or 18 sheet iron, from A to B.

Be careful to see that the furnaces at every point are so constructed as not to come in near contact with the sides or walls of the barn, lateral or vertical, and that the exits of the pipe are protected by brick or stone, as seen in the diagram.

Insert sheet-iron pipes at B B on cast-iron eyes made for the purpose and placed into the ends of the furnaces, as near the tops thereof as possible. The eyes are not absolutely necessary, but they greatly protect the pipe from burning, and, being fixed into the ends of the furnaces, the pipe is more readily adjusted. For a 20 x 20 foot barn use pipe 11 or 12 inches in diameter; for a barn 16 x 16 feet use 10-inch pipe. Extend the pipe all around from B B to D D, with a gradual elevation of 1 foot from B to C and with 2 feet elevation from C to D. Cap the ends of the pipe with an elbow. For small barns the pipes may be brought together, as shown by the dotted lines, midway between C and C by a Y connection into one 12-inch return flue through the middle of the barn. This flue operates very well, and is very popular with planters working a small force and using only small barns, which are better for them than large flues, and this is the cheapest good flue made.



Tobacco Drying Apparatus.

Any tinner can make the pipe, and foundries and hardware stores furnish the eyes. The cost of pipe varies from 5½ cents to 6½ cents per pound, and 10-inch cast eyes cost about $2 a pair, and 12-inch eyes about $2.50. The cost of piping for a small barn varies from $8 to $10 or less.

From A. G. S., *Dayton, Tenn.*—In reply to "T. A. S.," in *The Metal Worker* of August 5, there is no special heater made for tobacco drying. Usually a brick fire chamber is made and smoke pipe run around the barn on a slight incline to the flue.

A correspondent writes us that "T. A. S.," Nashville, Tenn., can get information about tobacco drying apparatus by addressing H. C. Bare, Alderson, W. Va.

PLUMBING and GAS FITTING.

Registration of New York Plumbers.

The new law for the registration of plumbers in New York State goes into effect September 1, yet there are over 400 plumbers in this city who have made no application to the examining board to comply with its requirements. This law, as originally passed, was to go into effect March 1, but by special legislation the time was extended to September 1 to enable its provisions to be carried out. The fact that it did not go into effect March 1 may have led some to believe that it became obsolete, but it is to be feared that they will suffer inconvenience if they hold to this view. However, this cannot be true of the great number who have failed to comply and they should take the necessary steps at once by filing an application with the Chief Inspector of the Department of Building at Fourth avenue and Eighteenth street. Even this will leave a large number to be examined after the law is in force and only a generous interpretation of it will permit the applicants to transact business until the result of their examination entitles them to a certificate or forces them to suspend business until they can show the necessary qualification. There is a limit to the number that the board can properly attend to in a day and it will be impossible for them to examine the tardy plumbers before the date fixed if all should make application. Those, however, who fail to provide themselves with the necessary papers, according to the law, will have no one to blame but themselves should they feel its force.

A Review of Recent Plumbing Practice.*

BY GLENN BROWN, F.A.I.A.

(Concluded.)

VENTILATION OF THE PIPE SYSTEM.

The fresh-air inlet and the soil pipe opening above the roof is, I think, now approved by all who have given the subject consideration. I am sorry to say that trap ventilation—*i. e.*, a vent pipe from the crown of the trap—is a matter still in dispute.

I have space simply to touch upon this subject in such a running review as I have been requested to make. Experiments have been made by Lissauer in Germany, S. S. Hellyer in London, Philbrick and Bowditch in Boston, the Master Plumbers' Association of Worcester, and Glenn Brown of Washington. The conclusion is drawn by each of the above experimenters that trap ventilation is the best method of preventing syphonage and back pressure. George E. Waring of Newport and J. P. Putnam of Boston deduce from their experiments that trap ventilation is a fallacy. The five experimenters first mentioned draw their deductions from the fact that it is practically impossible to syphon or force by back pressure a properly ventilated trap, while all unventilated non-mechanical traps are liable under one contingency or another to syphonage and back pressure.

Although the conclusions of Messrs. Putnam and Waring are the same, they are drawn from diametrically opposite standpoints. Mr. Waring concludes that vents are useless because traps will never syphon in ordinary contingencies. From his experiments Mr. Waring must admit that traps are better protected with vents. Mr. Putnam concludes that vents are useless because vented traps under ordinary circumstances are never safe against syphonage. Messrs. Putnam and Rice, who conducted their experiments jointly, are the only experimenters of the seven who conclude that trap ventilation is useless because of non-protection.

Dr. Lissauer, S. S. Hellyer, E. S. Philbrick and E. W. Bowditch, and the experiments at the Museum of Hygiene, show the necessity and utility of trap ventilation, to protect the seal from both back pressure and syphonage. All the contingencies that would be likely to occur in ordinary practice are covered by one or the other experimenters, traps mechanical, non-mechanical of varying sizes being used, long and crooked vents of varying size and length being used by S. S. Hellyer and at the Museum of Hygiene; small and large waste pipes being used by S. S. Hellyer and E. S. Philbrick; the effect of syphonage by momentum being specially tested by E. S. Philbrick; the effect of discharges in stories above and below the traps being tested by all the experimenters.

From Mr. Waring's experiments I would draw the conclusion that ventilation is a necessity, although he draws the opposite conclusion therefrom. Traps unventilated were syphoned with soil pipe open, while his vented traps in other positions were not syphoned, even when soil pipe was closed.

The experiments of J. P. Putnam are the only ones which show failure by syphonage and back pressure in almost every case with vented S-traps. Taking in consideration the results of the six other experimenters, the results shown in those of Mr. Putnam must be attributed to the unusual form of his apparatus, he having adopted unusual combinations. Mr. Putnam's experiments apparently show that the Sanitas and the larger pot traps resisted back pressure. The reason for this was that his apparatus was arranged in the most favorable manner to prevent back pressure, a straight soil pipe with the minimum amount of friction and a fresh-air inlet open. Now, in actual practice the soil pipe often necessarily has offsets and bends, and the fresh-air inlets in 75 per cent. of actual cases (the small perforated covers) are closed or partially closed by dirt, when the maximum of back pressure would be encountered, and when no trap in ordinary use would have sufficient water to counteract the pressure. Then all the water in the trap is not necessarily driven in the pipe above the trap, but air is forced back through it, usually in bubbles, the water passing up partially above the trap and falling back.

Even should Mr. Putnam's proposed method—*i. e.*, placing the trap at a sufficient distance below the fixture—prevent back pressure, I do not see how it could in practice be applied to any fixture—except wash basins and sinks; we could not go sufficiently below the floor for bathtubs. Mr. Putnam does not offer us a substitute for the S-trap in plain hopper closets, slop hoppers, &c., or object to the foul matter between the basin and trap. That trap ventilation is necessary for large S-traps under hopper closets, slop hoppers, &c., I think even he would admit. The danger of sewer air passing in bubbles by back pressure has been questioned. Sewer air is dangerous only in case disease-producing germs are in it, and in this case bubbles passing through by back pressure would be dangerous.

Prof. Raphael Pumpelly, in his experiments, covers this point of danger in bubbles passing through traps I quote from the national Board of Health Bulletin 13.

The conclusions from the experiments are given by Professor Pumpelly in the following words: "At normal summer temperatures no germs were given off from the decomposing liquids whenever their surfaces remained unbroken, even though in some of the experiments the air was continuously conducted over them in a slow current. When the surfaces of the liquid were broken, however, by the bursting of bubbles, germs were invariably given off and sterilized infusions infected, no matter how slowly the aspiration was conducted."

Since the above experiments were made J. E. Denton made similar ones on ball traps, tortuous passage traps, without vents, and on S-traps with vents, and with the McClellan vent. They prove only what has been already proved in previous experiments, that properly vented traps are better than others. The bulk of these experiments were with the McClellan inlet, showing it to be equal to a vent 13½ feet long of 1½-inch wrought-iron pipe, with two elbows. In neither case does this protect against back pressure. It proves that the 3-inch vertical vent should run parallel with soil pipe, the only thing that will prevent the severest syphonage and back pressure.

The deductions to be drawn from the above facts are:

1. That unventilated traps are liable to fail from either or both syphonage and back pressure.
2. That small traps should have vents the size of the trap, and the main vertical vent should be 3 inches in diameter in ordinary dwelling houses, computed for larger houses
3. Ventilated traps do not fail by either back pressure or syphonage.
4. That ventilation through pipes of the proper size should be required in all specifications.

STOPPAGE OF VENTS.

There is one point which it seems proper to mention in connection with trap vents —*i. e.*, the claim that they are stopped by accretions from the grease and other matters thrown into them by the water passing through the trap. I have been making inquiries as to old traps taken out and have never found vents stopped, with the exception of a few found in water-closet traps. Recently I had a vent opened in a 1¼-inch S-trap, under a sink, in constant use by four or five families in a tenement, for kitchen and other slops, which, to my knowledge, had been in use constantly for between four and five years. The 1¼-inch vent was attached directly at the crown of the trap by a wiped solder joint in the common way without being bell-shaped or enlarged. The use to which it had been subjected, the position and method of attaching the vent, made conditions the most favorable for stoppage. The vent was found entirely free from accretions; there was probably 1-16 inch of grease and slime on the sides of the trap and vent. The point of attachment and the vent were cleaner than the trap. From this and numerous other inquiries I have made, I conclude that trap vents stop from such accretions only under peculiar conditions. Traps are now made to prevent such possible accretions.

Trap ventilation is important, not only on account of syphonage, but because the constant current of air passing through the trap hastens the division of decayed matter into its constituent gases. The question of increased evaporation caused by trap ventilation is one, I think, of little practical importance, as failure is never likely to occur from this cause, except in unoccupied houses, and in cases of this kind, either ventilated or unventilated traps should be specially looked after.

Methods of testing pipe systems: The smoke and peppermint tests are of little service, as they do not represent any pressure; filling the pipes with water or testing them with compressed air, the pressure showing on a gauge, being the only reliable methods.

*Prepared for convention American Institute of Architects. Read by courtesy of the institute at World's Congress of Architects in Chicago, August 4, 1893.

APPARENT RECENT IMPROVEMENT IN PLUMBING FIXTURES.

I say apparent because many have not been in use long enough to give the guarantee which time alone can give.

Water closets: Several years ago, in the preparation of my work on water closets, I stated that the only objection to the short hopper closet was the small water surface; but even with this defect I considered it the best form in the market. Quite recently two manufacturers, Dalton & Ingersoll and J. L. Mott, have put upon the market short hopper closets with enlarged water surfaces, which is a decided improvement. These forms, from their extreme simplicity, efficiency and cleanliness, still keep this class of closet in the lead. I consider the different forms of syphon closets the next best. Quite an improvement has been made in the seats of closets by attaching the seat and lid to the bowl itself; in this way the seat is detached from the wall and the space behind the closet is open to inspection. Cooper and Mott have introduced such seats.

The introduction of porcelain and earthenware sinks, laundry tubs, slop hoppers and other fixtures is a great addition to healthfulness. Such things are too costly for the ordinary householder.

The wood fiber plumbing fixtures are neat and cleanly in appearance, light and easily handled. I have not yet had much experience in their durability.

The new copper-lined steel bathtub is an improvement worthy of notice for houses of moderate cost.

The great gain in recent years from adopting open fixtures, tiling and doing away with wood work in the bathroom is so well known, although of recent adoption, that it scarcely seems necessary to call attention to the fact.

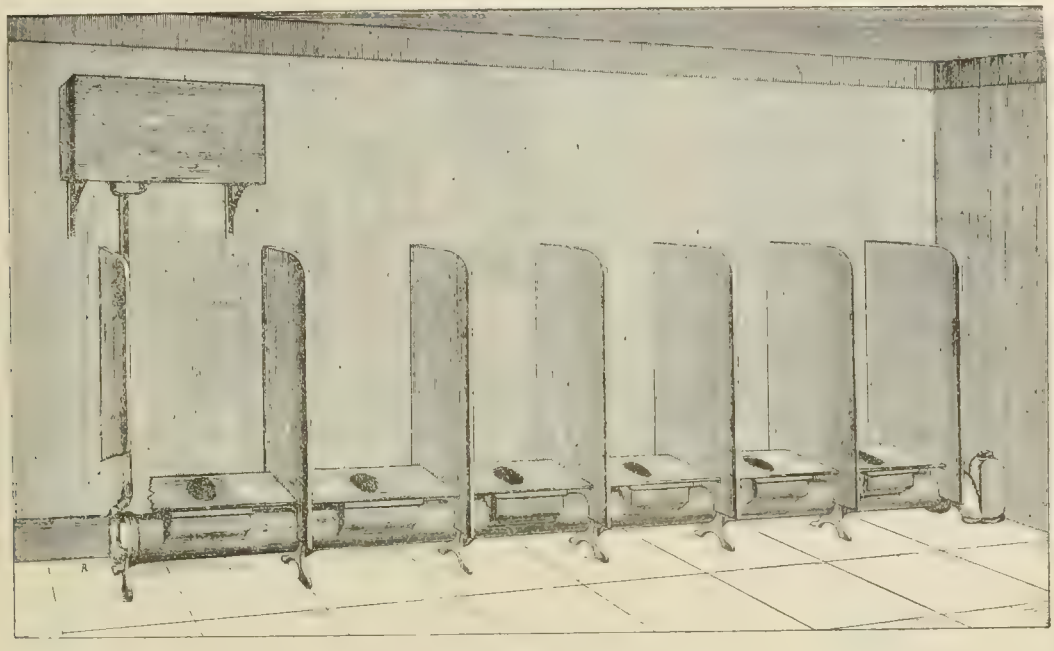
A CLAMBAKE at Rye Beach on August 29 is to be the diversion of the master plumbers of New York in continuation of an annual custom long since established, which is considered as advantageous as it is pleasant to the association.

The Syphon "Eduction" Closet Range.

The Walcott-Hurlbut Company, 175–177 Lake street, Chicago, are introducing to the trade the Syphon "Eduction" closet range, which is said to have all the advantages of separate closets and to be a perfect sanitary substitute for trough closets. As shown in Figs. 1 and 2, the closets are made in sections, and they can be increased by adding any number of sections desired. The supply tank above the closets is filled from the water supply, a cock being provided for regulating the time between intervals of flushing. In this tank is placed the syphon, which has no movable parts.

The syphon is an adaptation of the Field-Waring patents, with Poore's breaking device to flushing closets and urinals. The syphon consists of an annular intaking limb, at the top of which is an annular mouthpiece, the bottom of which is tapped to a less diameter. The discharge limb has a brass cup suspended under the lower end of it. The syphon is brought into action (the tank being filled) by means of a small stream of water flowing over the annular mouthpiece and falling free of the sides of the discharging limb. As soon as the lower end of the discharging limb has been sealed by the filling of the cup, the falling stream of water gathers up and carries out with it a portion of the contained air, thus producing a slight rarefaction. This causes the water to rise and overflow the mouthpiece of the discharging limb, causing more rarefaction. This continues until the syphon is brought into full play. On the tank being emptied to the bottom of the intaking limb the flow is checked and air enters the discharging limb, and the syphon is vented, ready to start again as soon as the tank is filled.

When the tank discharges it flushes all parts of the closets liable to become foul, and at the same time raises the water which starts the syphon (Fig. 3) opposite end A in Figs. 1 or 2, which draws out all water contained in the closets. The secondary syphon or after flush refills the closets to the depth of 7 inches. This great depth of water forms a separate water seal between each seat, thus giving all the advantages of separate closets. There is a space of 2 feet between centers of each seat, and between each seat there



The Syphon "Eduction" Closets.—Fig. 1.—View of Closets and Supply Tank.

Fig. 2.—Plan of Closets.

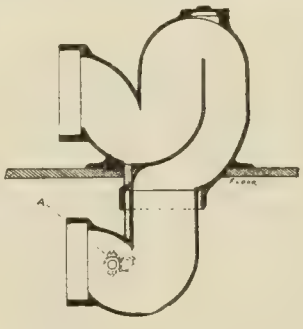


Fig. 3.—Syphon at End of Closets Opposite A, Fig. 1.

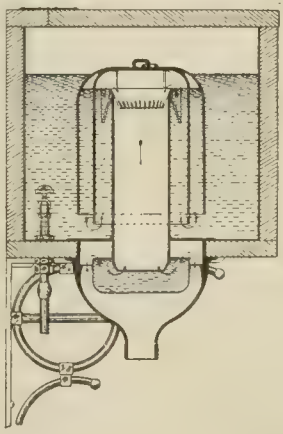


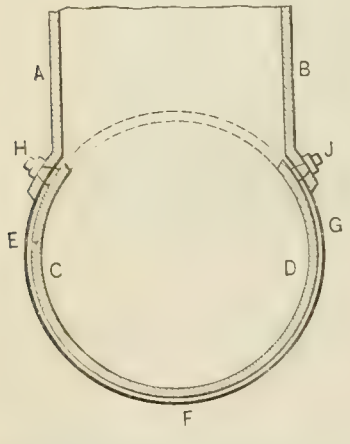
Fig. 4.—Section of Flush Tank Syphon.

are lugs on which to bolt the wood partitions, leaving the space under the closets clear and easy of access for cleaning. Stop cock A, in Fig. 3, connects with lowest point of closets, and on being opened will drain the closets dry (the water supply being shut off), thus preventing freezing during cold nights or when the closets are not in use.

Connecting Saddle Hubs.

From P. D., *Newark, N. J.*—I would like to be informed through the columns of *The Metal Worker* of a convenient method for connecting saddle hubs to cast-iron soil pipe.

Answer.—When a saddle hub is to be connected to a cast-iron soil pipe the hub is laid on the pipe and the



Connecting Saddle Hubs.—Fig. 1.—*First Method.*

shape of opening to be cut in pipe marked; then holes are drilled near together inside of the mark so the piece can be broken out without danger to the pipe. After this opera-

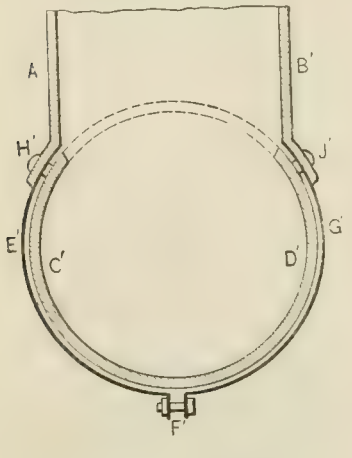


Fig. 2.—*Second Method.*

tion has been performed the edge of opening should be cut or filed so there will be no obstruction to the flow of soil through the connecting hub. In Fig. 1 A B represents the saddle hub and C D the soil pipe. Holes are drilled through the edges of hub for the reception of bolts, as shown at H and J. The iron strap E F G passes around the soil pipe, and is secured to the hub by the bolts H J, which pass through holes in the ends of strap. It is usual to cover the flange on saddle hub with putty before placing in position, when the nuts at H and J are screwed up tight, and, if the strap is of the proper length, should hold the hub firmly to the pipe.

Another method is shown in Fig. 2, in which two straps are used. These straps can be bolted or riveted to the hub at H' and J', and by having the ends bent over and holes made, the straps can be tightly drawn together by means of a bolt, as shown at F'. If it is not desired to use straps in the manner shown, by drilling holes through the edge of hub and soil pipe, then tapping the holes in pipe, the hub can be bolted on. When this method is used care should be taken that the bolts do not project into the soil pipe.

TRAPS AND VENTS.

AT A RECENT MEETING of the Board of Health of Binghamton, N. Y., Sanitary Inspector O. R. Mason was appointed Plumbing Inspector under the new law. They also authorized the City Attorney to bring suit against a citizen who had failed to put his property in proper sanitary condition.

THE HIGHGATE MUSEUM of Sanitary Appliances, in London, which was opened by the Lord Mayor of that city in December last, is said to be greatly appreciated by the public. During the eight months of its existence the Museum has been visited by 13,000 persons, an average of 64 visitors each day. This is the first museum of its kind in England, and the attendance shows that the London sanitary authorities succeeded in supplying a real need.

EX-ASSESSOR JOHN J. PURCELL, who obtained an average of 92 on a civil service examination, has been appointed Inspector of Plumbing at Troy, N. Y., at a salary of $1000 per year. This is in accordance with the plumbing regulations recently adopted under the new State law.

THE ANNUAL OUTING AND FISH DINNER of the master plumbers of Boston, Mass., was recently enjoyed at Bass Point, many novel contests enlivening the occasion.

THE BOARD OF HEALTH of Waltham, Mass., are perfecting plumbing regulations to be passed by the aldermen in compliance with the new statute law.

A NEW tinning, plumbing and gasfitting shop is being started at Nanticoke, Pa., by two young men, E. Morgan and John Griffiths.

JOHN TOWNSEND has moved from New Castle to Wilmington, Del., where he has engaged in the plumbing business.

THE WELL-KNOWN FIRM of plumbers, Byrne & Tucker, arranged to dissolve partnership on August 1, and the time since has been occupied in winding up their business. John Tucker is fitting up an office at 45 East Twentieth street, New York, and Thomas J. Byrne is arranging to do business at 377 Fourth avenue after the old stand has been closed.

THE BOARD OF HEALTH of Springfield, Mass., have appointed Frank W. Tower Inspector of Plumbing, he having secured an average of 94.5 in a civil service examination. Mr. Tower is a plumber of 21 years' experience, 16 of which have been spent in conducting a business for himself. He is arranging to sell out his business and his term of office will commence when this is effected. He has also been appointed one of the Board of Examiners, as the new law requires that one member must be an expert plumber. One of his important duties will be to aid in forming new regulations to be enacted as an ordinance to govern plumbing work.

PLUMBER MORAN of Jersey City, N. J., had a lot of block tin offered him at 11 cents a pound and made an engagement to meet the owner and haul it away, but in the meantime apprised the police of the affair, and a detective who went to help get the tin secured a crook and counterfeiter.

THE PLUMBERS of Los Angeles, Cal., appear to be acting in concert with those in New York City, so far as delay in getting their certificates is concerned. It appears that an ordinance was passed May 5 requiring the examination of plumbers, but up to August 15, we understand, there have been only three or four applicants. In a reported interview with Building Superintendent Eisen, it is stated that the master plumbers failing to get certificates from the board will, after September 1, be refused permits in his office, and all journeyman plumbers who do not hold certificates after the same date will be ineligible to work on any building.

THE PLUMBERS of Galveston, Texas, made elaborate preparations to receive their fellow craftsmen from Houston, who were to meet with them on August 19. One of the features of the day's amusements was to be a baseball game in the afternoon.

Apples for Iron.

Reaumer, the great French metallurgist, who was one of the pioneers of modern iron founding, thus describes some of the "tinker founders" of his day (1722–1757), who traveled with portable furnaces doing job founding on a primitive scale:

There are founders who do nothing every day but to melt cast iron and no other metal. Their number is not large, and I do not know whether there are more than one or two in Paris. These founders travel through the country and make their appearance gradually in different provinces. They make cast-iron weights, plates for different purposes, cast new, and patch old, hollow-ware. These founders buy the pig iron they want from peddlers, who gather cast-iron scrap in the villages in the vicinity of Paris. This scrap is exchanged for apples; a man with scales in one hand, leading a horse laden with poor fruit, does the business, exchanging apples for iron, weight for weight.

American lamps are rapidly taking the lead throughout the world. One of the largest exporters of these goods in the United States lately told the representative of a contemporary that the only competitor who now interferes with him is the German manufacturer. It appears that German lamps of the cheaper grades are lower in price than the American goods; but in the finer qualities of lamps the American manufacturer excels all his foreign rivals. His goods are more artistic and better in construction.

A large amount of real estate exchanged hands in Chicago last week in the course of settlement with creditors by Cudahy, Fairbank and other losers in the late provision collapse.

ROOFING AND CORNICE.

Painting Metal Roofs.

From A. A., *Brooklyn, N. Y.*—I wish to be informed regarding the painting of metal roofs. I once thought it a proper time to paint them with good linseed oil paint as soon as they were finished, but other people claim that the roofs should be a little rusty before applying the paint.

Answer.—The following article from the *Painter's Magazine* has a bearing upon the subject, and while it relates only to the painting of iron surfaces, will be of interest: "The point of prime importance is the actual condition of the surface when ready to receive the first coat. Upon this point rests the success or non-success of subsequent applications, for if not in proper condition no paint will prove permanently preservative. Now, the best state is that where there has been formed upon the surface of the iron a film of black oxide which has been, while hot, thoroughly permeated by and incorporated with a resinous or tarry covering. This covering insures perfect success, and its thickness may be increased from time to time by additional coats of paint. If, however, a layer of hydrated oxide (ordinary rust) be once allowed to form the successive coats of paint will fall off, their separation from the iron being merely a question of time. During the time, also, the rust has been spreading under the paint. An instance of this may be seen after outdoor work has been in place for some time. Usually all the riveting is done before the final painting is begun, each rivet head in the meantime being exposed to a damp atmosphere, the paint begins to peel off the rivet heads long before it leaves the adjacent plates, and when this occurs nothing but thorough scraping will give the paint a chance to adhere again. So slight are the differences of manipulation which determine whether a given piece of work shall or shall not rust away that they may all be found in the different methods pursued now and formerly. Taking the case of a piece of ornamental iron work, which in so many instances has come down to us in unimpaired beauty and condition, it would now probably be forged in detail in one part of a factory, drilled, filed and fitted in another, and when completely finished, be painted in three coats of best oil paint. Formerly the smith who forged the work punched the necessary holes at the same time, fitted his various pieces together as he went on, completing each piece as he proceeded, doing all the work with his hammer, and to quote an old work of directions to good smiths, brushing his work over with linseed oil and suspending it for some time over a strongly smoking wood fire. This will give at once a sort of elastic enamel coat, perfectly adherent and calculated to preserve the iron to the utmost. Of course iron work to-day is not made to undergo any such preparatory process, and the consequence is that we find it very difficult to produce good results in painting on iron surfaces."

From the above article we can infer that an iron surface should not be left exposed to the weather until rust has formed, as once started this action is liable to continue, even though paint has been applied. Regarding the time that should elapse (if any) after a tin roof is laid before it is painted, much would depend upon circumstances. If the tin is covered with palm oil to such an extent as to render the paint liable to peel off, the roof can be left exposed to the weather until the oil has been washed off. Some roofers recommend that as soon as the roof is finished the surface should be washed with benzine or an alkali, thus removing all traces of palm oil or other grease. Another method recommended is to sprinkle sand over the tin and then sweep it off with a broom. In localities where coal is largely used for fuel, or near the sea coast, the surface of tin exposed to the weather is soon corroded, and when the cheaper grades of roofing plates are used the surface soon becomes covered with rust. It must be evident that the better qualities of plates, or those having a heavy coating, would withstand the atmospheric effects for a longer time. It is conceded by most painters and roofers that the surface of a tin roof should be free from grease and rosin before painting, and, a clean surface being obtained, the sooner the paint is applied the better.

Regarding the kind of paint to be used on a roof, the following from *Painting and Painting Materials* may be found useful: "The value of a paint is its oil, and economy consists in purchasing good oil—the best and purest to be obtained. Adulterations should be advantageous in some cases, but it should be done for a purpose. On roofs, 15 to 20 per cent. of fish oil will be an advantage, and on bridges, which are not so frequently repainted, probably a little cotton-seed oil will do no injury. The principle of adulteration is very simple; the more 'elastic' the first coat the more durable, but the greater tendency to crack the second coat. The weather coat should always be the more 'elastic' (containing more non-drying oil); but a man of judgment will discriminate. The most elastic (in the true sense) of all oils is boiled oil; but it is too thick, and needs mixing with raw oil or with turpentine. A priming of such oil thoroughly dried will stick if red lead be added and not put on too thick. A little boiled thoroughly mixed with raw oil increases its elasticity, but probably increases the chances that the paint will wrinkle, pit and crawl a little; although if care be taken in the mixing and using any such effect should be so small as to be imperceptible. There is this strong reason for using more or less boiled oil—that the pigment, at least lead pigment, will more thoroughly unite with and harden the oil, as boiled oil is partly composed of free linseed-oil acid, and we shall thus get more hard soap. At the same time we thus get a harder oil. We always get with the boiled a certain quantity of oil rubber, produced by the boiling, and which, so long as it remains, gives the oil a rubber-like elasticity."

FLASHINGS.

CONTRACTS have been closed to build a sheet mill for the Los Angeles Iron & Steel Company of Los Angeles, Cal. The persons chiefly interested are J. G. Chamberlain, formerly of the Cherry Valley Iron Company, Leetonia, Ohio, and A. S. Robbins. Local scrap and imported billets are to be the raw materials.

THE BIRMINGHAM PAINT, OIL & ROOFING COMPANY, Birmingham, Ala., will make an addition to their works for grinding dry paints, utilizing ores from beds near Birmingham.

THE GLOBE VENTILATOR COMPANY, Troy, N. Y., have sold through L. H. Prentice & Co. of Chicago two 60-inch ventilators to the University of Chicago for use on the Ryerson Physical Laboratory.

THE accuracy of a quotation on sheets made in *The Metal Worker* August 5, has been questioned. Purchases at Ohio mills were made at that time at the following prices:

	Iron. Cents.	Steel. Cents.
64-100 to 71-100 pound per foot	2.65	2.75
72-100 to 87-100 pound per foot	2.55	2.65
88-100 to 125-100 pounds per foot	2.45	2.55
126-100 to 185-100 pounds per foot	2.35	2.45

The terms were 60 days' note or acceptance, or 2 per cent. discount for cash.

A noticeable outcome of the existing trade depression is the unusual increase in the number of steerage passengers booked this season from New York for European ports. The passenger traffic of this class is stated to be the heaviest on record.

STEAM AND HOT WATER.

Proportioning Hot-Air Pipes to Indirect Surface.

From D. M., *Bridgeport, Conn.*—Having occasion to bid on an indirect hot-water heating plant, which I lost, I give my experience in trying to find a rule for determining the size of flues to carry the warm air from the box coils to the registers. I went to two large cities where numerous manufacturers of hot-water apparatus had salesrooms, and I stopped in not less than 30 different places asking, after a preliminary chat, the question: "How many square inches of flue area should be allowed for each square foot of indirect hot-water surface?" As a result of my many queries I should adopt 1½ square inches of flue area for every foot of heating surface. If there were 50 square feet of heating surface I would make the flue 6 x 13 inches, or, if possible, 10 inches in diameter. The general idea for the cold-air supply was to make it 25 per cent. less in area than the heating flue. By some who answered my question I was told that ½ inch was enough, others said ¾, more said 1 inch, but the more experienced and reliable agreed on 1¼ and 1½ square inches, and I have since seen several jobs working very nicely on the 1½ inch basis, so I would not use a smaller proportion. I found a great many who did not favor indirect hot water for the entire job and were opposed to it on the first floor. They favored the fresh air which indirect heating furnished, and the use of some direct surface in the same rooms, but said that the great majority either could not stand the extra cost or simply would not.

English Practice in Hot-Water Heating—XXVI.*

IRREGULAR FORMS OF APPARATUS.

To carry the pipes of an apparatus in any way contrary to the principles laid down is, of course, never recommended, yet, at the same time, it is very commonly permissible if there is no possible means of doing otherwise. As an example, we can refer to the occasional practice of dipping a pipe in greenhouse work, if a doorway has to be passed. In the ordinary way, the pipes are carried around the house some 12 inches above the floor level, and to pass beneath a doorway opening means a dip in a pipe of at least this distance. This would be effected as in Fig. 107, but instead of carrying a pipe beneath the path tiles, a special pipe of square design can be obtained, and this would lay flush with the floor.

Now, a dip in a pipe creates an obstacle to the free circulation in a way that will be described directly, and considering the low speed of circulation or motive power that we get in horticultural works, it is very little indeed that we dare attempt in this direction. With building works the circumstances are different, for the speed at which the water moves is so much greater. It will be seen that with works extending up only 2 or 3 feet the circulation is sluggish enough to be an objection at all times if the services extend any distance and a fair degree of heat is required at the further extremities; and if we introduce anything to make the circulation still slower, trouble will most probably ensue, even supposing the dip does not entirely destroy efficiency.

According to the present accepted theory, the circulation of water in any apparatus depends upon the difference in weight of hot and cold water; the water in one pipe being heavier than the water in the other, and causing the latter to ascend. With an apparatus as Fig. 108, which we may suppose is a single pipe carried all the way round a house, we should have to pass a doorway somewhere, and the dip necessary to effect this is shown. (Let it be clearly understood that this is quite an imaginary arrangement, to illustrate the subject under discussion).

This apparatus can be carried, and would work in quite an ordinary manner to the point marked A, and so it would to C if it did not have to rise again; but from C to D the water is colder and heavier than it is between A and B, and consequently it would tend to bring about a retrograde movement—a movement in the contrary direction to what the water takes from the boiler to A. It is plain that the farther the water travels from the boiler the cooler it becomes, owing to its losing heat, as it is required to do; consequently the column of water C D must be colder than that from A to B, and its greater weight naturally opposes the movement of water in an upward direction. A very well-known writer upon heat, in dealing with the circulatory action of heated water, adopts an ingenious method of making the subject clear by spacing off the pipes in lengths of imaginary temperatures, as Figs. 109 and 110. By allowing a certain difference in weight to each space the theory can be very clearly dealt with.

With Fig. 109 we have a difference in mean temperature in the two columns of water of 33°. This may be called 33 grains (the actual difference is a greater weight than this), the water in the return pipe bringing about the circulation by it being thus much heavier than the water in the flow. By increasing or decreasing the hight of the pipes the motive power will be increased or decreased proportionately. If we plan an apparatus, as Fig. 110, and space it off, we find in theory that we get an equal weight in each pipe, and we may suppose that the water would fail to circulate either way. By the same reasoning

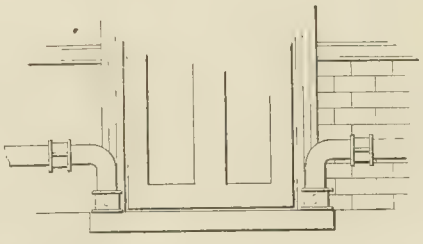
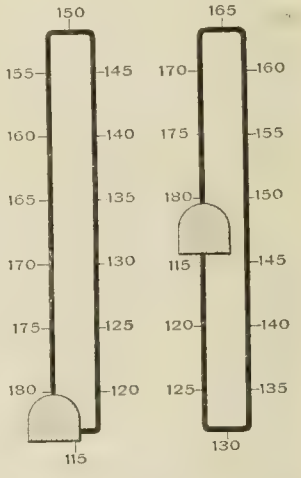


Fig. 107.—Showing Method of Running Pipe Across a Door Space.



Figs. 109 and 110.—Pipe Spaced Off in Lengths of Imaginary Temperatures.

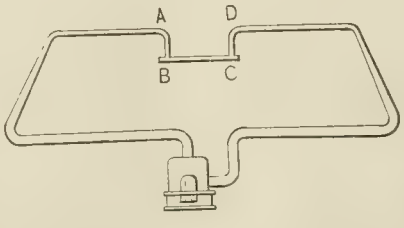


Fig. 108.—Pipe Carried from Boiler Round a House with "Dip" to Pass a Doorway.

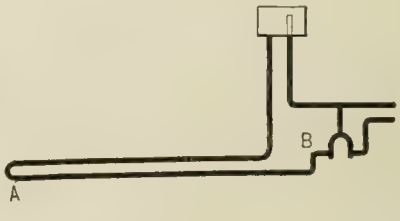


Fig. 111.—Showing an Arrangement of Pipes when Tank is Employed.

ENGLISH PRACTICE IN HOT-WATER HEATING.

* Reprinted from the *London Builder.*

we may expect a circulation more or less efficient by putting more pipe above the boiler than in the last cut, or, a reversed circulation if we carried the pipe further down below. This makes the theory plain, and in making dips in pipes it will be seen that, if of no great depth, they would prove no serious obstacle in building works, but in the average glass-house apparatus they are better avoided. As before mentioned, if, in these latter works, a dip did not actually stop the circulation, it would render the circulation more sluggish, and in long runs of pipe this is a great drawback.

Occasionally a boiler has to exist between two houses, which, being on rising ground, may bring one house a trifle lower than the boiler itself. This being the case, the more common plan adopted to permit of the pipes in this house being so low is to use a tank, as Fig. 111. The further use of the tank is to act as a feed cistern and air exit. The service from the right of the boiler is supposed to go to heat the house that is of sufficient hight; the service to the left is carried as shown, the flow to the tank by the most direct route, and the return acting as the radiating media. By thus circulating up to a higher point than usual we get a more efficient circulation, a higher motive power, which is always sufficient to make the apparatus work well if the rise of the return pipe to the boiler does not exceed, say, 18 inches. It will be understood that the tank shown is not absolutely necessary. If we carried pipe up to this hight with a feed cistern beside it, it would amount to the same thing, but would not have such a workmanlike appearance. The tank should have a cover to keep dirt from entering, as it fulfills the purposes of a supply cistern, as explained.

Occasionally, when a boiler is fixed somewhat centrally to the work, a tank is made use of, having a flow pipe to it from the boiler, but having several returns running in different directions. The flow would be carried to the tank by the most direct route, as just explained, the returns acting as the radiating pipes. It is said in favor of this plan that it allows of the freest possible escape of air, and it is further suggested by those who recommend the plan, that by the use of wooden plugs in the return pipes where they leave the tank, the need of stop cocks is dispensed with. Certainly by the use of a tank, placed in the highest position it can be, we get a better or stronger circulation, as will be understood.

The chief trouble experienced in works that depart from the regular form, is air dislodgment. It may appear an easy matter to many to get rid of air, that, it is admitted, does get in the pipes, and which must exist in the pipes before they are first charged, but every man with experience knows that air dislodgment partakes of the nature of a problem sometimes, and the solution is not discovered in a moment. In the illustration, Fig. 111, the return would descend to the point A, and then take an ascending direction all the way to the boiler, and, at first glance, there would be, apparently, no need for an air-pipe at all. This, however, is not the case, an air-pipe should be provided at B, not that there would be much use for it when the apparatus was once full and working well, but when charging the apparatus with water, there would be every probability of air being locked in the lower pipe between A and B, with ill results. In the same way an air vent would have to be provided both sides of the dip in Figs. 107 and 108. It has to be particularly remembered, also, that although an apparatus may perhaps be filled easily when first charging it, it does not follow that it can be filled as easily after it has had water once in it, for when emptying it will be practically impossible to get the water out of any dips there may be in the pipes, and these collecting points will prove obstacles to the free escape of air as the water is filled in again, unless, of course, air vents are provided.

This completes the papers upon "Warming Buildings by Hot Water," and our last suggestion to those who have the giving out of these works is to ascertain that the people intrusted with the work are capable and experienced; and, to those who execute the works, let it be an ambition to be master of the subject. This advice is, of course, good in all cases, but with hot-water works it is especially good, for it is really wonderful what perplexing difficulties a little want of knowledge may bring about, and what expense and trouble may be incurred in remedying such errors.

[THE END.]

HEATING NOTES.

ALBERT L. SNYDER, Topeka, Kan., is the patentee of an improvement in a hot water or steam heating apparatus. The special features aimed at in this heater is economy of heat and the use of soft coal. The heater consists of an upper dome and a lower annular water space forming the fire pot, connected to the upper dome by a series of vertical tubes. There is also another cylindrical water space around the combustion chamber between the dome and the lower water chamber. The dome is furthermore provided with drop tubes, increasing the heating surface. It is claimed for the heater that the arrangement of drafts is such that if any soot or dust accumulates it will be on the outside of the shell, where it can be easily removed.

THE FRIENDS of T. G. Haywood of the Denver house of the American Radiator Company will not be surprised to learn that his energy finds a wider scope for usefulness at the New York office.

THE LARGE PERCENTAGE of contracts awarded to the American Boiler Company, New York, from the number on which they have figured, they consider a compliment to their heating apparatus and system of installation.

AT THE CHICAGO MEETING of the Master Steam and Hot Water Fitters' Association the report presented by the Committee on Standard Flanges was adopted and the Executive Committee was instructed to circulate it among the manufacturers and the members of the association, with the request that the manufacturers adopt the standard submitted and that the steam fitters specify standard flanges in ordering goods. In pursuance of these instructions the Executive Committee issue in the form of a small pamphlet the report of the Committee on the Standardization of Flanges. It is a neat little publication containing the text, together with the illustrations accompanying the report.

BY MUTUAL AGREEMENT between the American Radiator Company and the Standard Radiator Company, the exclusive sale of the Standard Company's radiators through the American Radiator Company has been discontinued. The American Radiator Company, however, have a very large stock of Standard Company radiators and are prepared to supply the trade with the same.

EDWARD F. KEATING of 75 John street, New York, is issuing invitations to friends in the trade to inspect his new storerooms, machine shops and pipe warehouses at 187–189 and 452–454 Cherry street and 435–437 Water street on Tuesday, August 29, from noon till 5 p.m.

Electric Light and the Eyesight.

There are many people who regard the incandescent electric light as having an injurious effect on the eyesight. To these individuals the following consensus of opinions obtained by a leading electrical journal of London through a canvass of the principal oculists of that city should bear some weight in refutation of their unfavorable opinion of the latest illuminant. The journal in question recently published the following points as a *résumé* of the facts and opinions elicited from the specialists above referred to:

1. No authenticated case of injury to eyesight through the incandescent electric light has ever been recorded.
2. In point of purity, sufficiency, absence of heat, steadiness and adaptability, electric light is preferable to either gas, oil lamps or candles.
3. The only eyes which are likely to be injured by electric light are those already suffering from weakness or derangement, for which a dark room is necessary.
4. In less serious cases a change from gas to electric light has been found decidedly beneficial.
5. In its constitution electric light very closely resembles sunlight, and has a far smaller proportion of harmful rays than any of its rival illuminants.
6. The extreme ease with which it can be managed makes electric light capable of being perfectly shaded and placed.
7. Electric light under proper conditions of use is the best form of artificial lighting known.

Professor Semmola of Italy is reported to have used the electric battery with splendid success in cases of chronic lead poisoning. Based upon the well-known fact that electricity promotes assimilation, he used the battery and found that, under the influence of the current, the lead residue was thrown off and passed away with the secretions. At the end of three months nearly all his patients could be dismissed as cured.

Sharpers are now employing the aid of electricity in "sweating" gold coins. They can extract about 75 cents' worth of precious metal from each piece without altering its appearance.

Sawdust building bricks, a German invention, are thus described: The sawdust is dried and screened, to remove the coarser particles, and is then mixed with cement, lime and sand in the following proportions: One part cement, 2 parts lime, 5 parts sharp sand, and 2 parts sawdust. The sawdust is first mixed dry with the cement and sand. The final mixture is pressed into blocks, which are said to be cheap and useful. There is as much lime, and more than twice as much sand as sawdust in them.

World's Fair Exhibits.

WICKES REFRIGERATOR COMPANY of Chicago and New York exhibit specimens of special Refrigerator work of a high order. One is a tile-lined Refrigerator room, large enough for a man to enter to handle the contents. It is entirely lined with white tiles, has double glass windows in the door and the sides, and is furnished with capacious shelves of galvanized-iron. The ice chamber occupies one-third of the structure and is arranged to secure a thorough circulation of the air currents. An incandescent electric light illuminates the interior at night. Other Refrigerators shown are for the use of merchants desiring to exhibit perishable articles under glass, having double glass fronts with shelves back of them, while the ice chambers are in the rear. A grocer's large Refrigerator is fitted with glass shelves, wire-cloth shelves and wooden racks for special articles, drawers with wire-cloth bottoms and a large compartment the full size of the Refrigerator for hanging large pieces of meat. A family Ice Chest is made with an ice chamber in the center and provision chambers on both sides. A galvanized-iron box holds the ice in the ice chamber. This box can be drawn out horizontally on a jointed frame, having feet to rest on the floor, which are snugly folded up when not in use. This Refrigerator can consequently be made with a table top and used for other purposes, as all the openings are below in front.

D. R. SPERRY & Co. of Batavia, Ill., make a striking exhibit of their cast-iron wares in the Manufactures Building. They have erected a pavilion with columns composed of Drug Mortars, placed with tops and bottoms alternating; these columns are joined by a cast-iron frame work at the top, which supports a roof consisting of Farm Kettles, above which is a spire of Sugar Kettles, terminating in a finial of two Caldrons, the top one being inverted over the lower one, making a sphere. The top Caldron is gilded, while the lower one is embellished with representations of the firm's trade-mark. Kitchen utensils, such as Pots, Skillets, &c., are arranged under the pavilion. There are also steam jacket Kettles, the Rival Farm Boiler, Felloe Oilers and other articles made by the firm for use by farmers, dairymen, &c. The whole arrangement of this exhibit is highly ingenious and very creditable to the designer.

SMITH & ANTHONY STOVE COMPANY of Boston make a special exhibit of Whiteley's pattern seamless jacket Kettles, manufactured for the use of hotels, restaurants, public institutions, curriers, tanners, soap makers and others requiring steam jacket Kettles. The samples shown range from small ones holding 20 gallons to a huge Kettle with a holding capacity of 125 gallons. The company also make a half-jacket Kettle, which is lower priced and is equally strong but does not boil so quickly as the full jacket.

THE CLINTON WIRE CLOTH COMPANY of Clinton, Mass., make a notable exhibit of their products. Two sides of the space are inclosed by an ornamental brass railing, above which is the name of the company on a Wire sign. The other two sides are filled in with panels consisting of small frames covered with samples of the company's products, such as Wire Cloth, Poultry Netting, Perforated Metal, &c. All sizes of Mesh and a variety of Metals are used in the construction of these panels, which in themselves illustrate the comprehensive character of the line of goods made. The two entrances to the inclosure are flanked by great rolls of Wire Cloth, 72 inches wide, which stand up like huge pillars. Inside the floor space is well covered with rolls of "Silver Finish" Wire Cloth and Poultry Netting, in all widths, all sizes of mesh, different gauges of Wire, as also in various metals and different colors. Some are arranged on the floor and others on platforms to give variety to the exhibit. The Perforated Sheet Metal, also shown, is a conspicuous feature of the display, illustrating the capabilities of the company in this direction. Mounted in a fine oak frame, pivoted on a stand, is a specimen of plastering done on the Clinton Metal Furred Wire Lath. The mortar is so well keyed that the claim of the company appears substantiated that ceilings plastered on this Lath will never crack. The Wire Lath is made in a number of styles, comprising the Clinton double twist warp, Clinton stiffened, Clinton corrugated and Steven's rigid, plain, japanned or galvanized. It has been used in the construction of large buildings in all the leading cities of the country where fire proof partitions were desired. The exhibit is made in the Building of Manufactures and Liberal Arts.

The American Drummer.

The Kansas City *Star* has this to say about the American drummer:

The commercial traveler of the United States illustrates the growth and extension and improvement and elevation of the world and humanity. Genealogically he is descended from the bagman of the last century, who figures in so many good stories: he who first traveled on horseback selling goods by sample, as distinguished from the peddler who sold the articles themselves. The bagman, deriving his title from his saddlebags, represented the extension of commerce and the growth of manufactures. He effected the direct connection between the wholesaler and the retailer, between the port and the interior, between the centers of commerce and manufactures and the widespread country. He was the ambassador, the missionary, of trade. With the coming of railroads and steamboats the horseback traveler and his saddlebags gradually disappeared, and so the name bagman went out of use. The original labors of this disseminator of trade were greatly increased in this country, and from the fact that his business was to vigorously solicit business with an energy like that of the "alarming drum" came the appellation "drummer" still in use; but with the increasing magnitude and, as may be said, the increasing dignity of his operations came a yet more comprehensive designation, and the bagman of old became the commercial traveler of to day, as much greater than his commercial ancestor as a locomotive is in power than a horse, and as the colossal sample trunk of the nineteenth century is to the saddlebags of the eighteenth.

The commercial traveler, mustering by thousands, is now a great factor and feature in American business and social life. The drummers form a great society and they have divided and subdivided the land among them. Incessantly traveling, they have directly and indirectly regulated lines and facilities of travel. Every railroad line has felt their influence, and they have raised the hotel standard of the country. The commercial traveler, being an American citizen and usually a voter, is necessarily a politician, and if he does not control elections (and he has been known to do that), he becomes a good judge as to how the election is going. He moves about among the people and becomes a "people's man;" he is an authority on popular events and questions; he connects distant communities, facilitates the exchange of ideas, carries the news and fosters the brotherhood of man.

Zinc in Germany.

The following information regarding the production of zinc in Germany is given in *Kuhlow's Trade Review*:

Germany produces more zinc than any other country in the world; the exportation of zinc is, accordingly, very heavy, amounting to 58,000 tons, against an importation of not quite 9000 tons. The main zinc producing district is in Upper Silesia, where the metal is made from calamine, and also more and more from zinc-blende by distillation. The smelting of zinc-blende has led here, as in other places, to the establishment of very perfect arrangements for utilizing and preventing the deleterious effects of the sulphurous acid generated in the roasting of the ore.

In Germany in 1890 139,000 tons of zinc were smelted, in which work 9271 men were employed. The value of the output was 62,000,000 marks ($15,500,000 approximately), of which 64 per cent. were produced in Upper Silesia, 20 per cent. in the Arnsberg district, and the remainder in the Government districts of Dusseldorf and Aachen (Aix-la-Chapelle) and the kingdom of Saxony. The ore in the western parts of the country is, in the main, zinc blende.

The smelting of zinc is made very difficult in most localities by the presence of other metals in the ore. However, by a careful preparation of the ores and purification of the zinc obtained this difficulty has been overcome. By the use of regenerative gas heating furnaces and well-adapted condensers the cost of production has been reduced and loss of metal prevented. With the smelting of zinc a small production of cadmium is connected.

A Reverential Custom.

In seeking some information at a large fertilizing supply house, the question of bones came up through some fine specimens of antlers displayed in a glass case. It was learned that cargoes of bones were imported from many parts of the world, a shipload being then on the way from Egypt. On asking if human bones were ever found in the collection, an unwritten law was discovered that appears to be universally recognized and administered. In their daily contact in this business with bones of all sorts it is almost intuitively learned to what animal and what part a bone belongs, and when, as sometimes happens, a human bone forms part of the collection, it is instantly recognized and carefully laid aside. These human bones are invariably buried in a place that is less used than other parts of the grounds of the mill and are not unnecessarily disturbed.

The establishment of a Government dockyard is being considered in connection with the proposed improvement of the Mexican navy. The port of Guaymas is said to be its probable location. Vera Cruz is to have an arsenal and a floating dock. The latter is being built in France.

STOVE TRADE NOTES.

The Future of the Hot-Air Furnace.

By A. W. Glessner,

President of the Excelsior Steel Furnace Company.

INTERESTING THE CONTRACTOR OR BUILDER.

In many places the carpenter combines in himself the profession of architect and builder, and not only furnishes the plans and specifications, but undertakes the entire contract for the structure, and hence is an important factor in discussing the furnace business. In fact, in most towns it would pay the furnaceman to keep on intimate terms with the personage referred to, and not allow an opportunity to pass of putting in a word in advocacy of the hot-air furnace. By instilling certain fundamental truths about hot-air heating into the mind of Mr. Builder he is gradually awakened to the importance of having improved heating in houses which he plans and erects, and he will soon be talking furnace to his clients, with the usual result, an increase in the furnace business.

It is through the country architect, contractor and builder (combined) that we must accomplish an object for which the furnaceman has long striven, and that is the incorporation into the plans and specifications of every house of adequate provisions for the heating, which shall include in the carpenter's contract the proper channels for the concealed pipes and also for the registers and boxes. The practical builder must surely see the necessity for this, as a much better and more economical building will result than if the channels are cut after all partitions have been set. I have spoken of this in another place, and have written various articles on the subject at different times with the hope that dealers would take up this matter with the architects and builders, and effect the much desired improvement, and have reason to believe that an improvement will result.

STOCK PLANS FOR HOUSES.

In conversation with contractors and builders I find that the great majority of them use stock plans for their houses, making such alterations as their customers may desire, and it has occurred to me that dealers could advance their interests by making estimates for builders of the cost of heating the most popular of these stock houses, which builders could have at their hands when talking to their clients. These estimates would be approximate, of course, but with a full line of furnaces, such as are now made by a number of concerns, the dealer could make his estimates elastic enough to cover both the cheaper and better grades of furnaces, with a variety of finishes in the registers and other materials used.

The average builder is a progressive fellow and does not wish to move along in the same groove year after year, and if his attention is directed to hot-air heating and its adaptability to the modern home or building I incline to think that he will show a disposition to investigate the subject closely, and dealers will do well to place all possible information in his hands and aid him to the best of their ability. Hot air is the heat for the average dwelling, store, church or schoolhouse, and the dealer should state this fact in no uncertain tones, and especially when the advocates of other forms of heating are pushing their wares so vigorously.

(*To be continued.*)

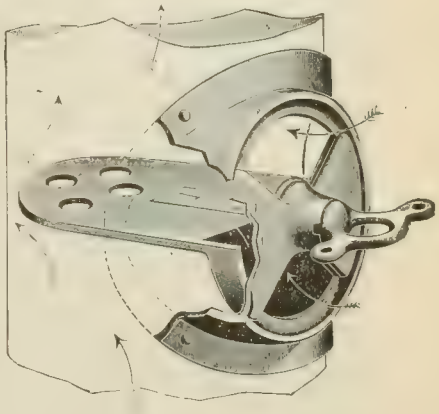
Tremont Stove Works.

The Anshutz-Bradberry Company, proprietors of the Tremont Stove Works, Allegheny, Pa., send us a copy of their catalogue and price-list which has just been issued from the press of Gies & Co. of Buffalo. The pamphlet is tastefully arranged and printed, being bound in flexible covers with side title in old gold. The corners of the pages are rounded and the edges finished in bright red, adding materially to the general effect. The goods shown cover an extensive assortment, into which the company have largely incorporated Bradberry's patent anti-clinker fire linings, for which strong claims are made. The leading place in the catalogue is given to the Perfect Tremont, a six-hole range, made in three sizes and a variety of styles. Among its constructive features may be mentioned large sheet steel bailed ash pan, patent cut long center, basket or shaking grate, patent oven-door opener, ventilated oven and nickel trimmings. This stove is followed by the Tremont steel-plate range, which has asbestos-lined flues, asbestos double bottom, double oven doors and warming closet. The leading cook stove is known under the name Tremont and is offered in three sizes. The Yantic and New Yantic are also members of this general class. The heaters occupy a number of pages and are represented by the Tremont, a new parlor stove of the Franklin type, made in two sizes. The Electric Tremont is another novelty in the way of open-front stoves, having sliding upper mica doors, round fire pot and draw-center shaking grate. The Tremont cottage parlor, the Menlo cannon, the Ionia, a recent addition to this class, together with a miscellaneous assortment of goods of cheaper construction, complete the list. A number of pages are given up to furnaces, school-house heaters, summer stoves for using natural gas as a fuel, hollow ware price lists, fenders, stove trucks, tables of warm-air registers and ventilators, as well as those giving the weight of the principal parts used for repairs. Another feature of the catalogue is a corrected list of stoves manufactured in Pittsburgh.

The Olive Stove Works of Rochester, Pa., have been closed for several weeks past for the purpose of making necessary repairs. Among the work which has been under way is a new roof, now being rapidly completed. It is expected that the works will resume operations within a few days.

An Improved Damper.

We show in the accompanying illustration a broken view of an improved form of damper, lately patented and put on the market by Uzal Cory & Co., 210 Water street, New York. The device is adapted for stove or furnace or other flues, the special feature being that it provides for the ventilation of the room and at the same time obviates the danger of gas escaping from the pipe into the apartment ventilated. Referring to the illustration, it will be seen to consist of a revolving face plate and a casing or setting that conforms to the cylindrical shape of the pipe, so that it can be riveted tight to the smoke flue when set in place. The damper disk, as shown in the illustration, is connected with a handle and is perforated to allow the slow passage of the products of combustion when it is closed. The special feature, however, is the arrangement of the ports. Ordinarily, where the revolution of the damper opens ports above and below the damper disk, there is opportunity for the gases to enter the room from below the damper plate, coming out through the lower port. In this improved form of damper, however, a passageway is formed back of the port to above the damper plate, so that air entering from the room through the lower port is conducted above the damper, and, although the gases below the damper may be under slight pressure when the latter is closed, there is no opportunity afforded for their escape into the room. This passageway leading above the damper, which is in the form of a hood, is mounted on the damper disk.



Broken View of Improved Damper.

Chinese Cook Stoves.

Some interesting information about the cooking utensils and cook stoves used by the Chinese is given by a writer in *Food*. A well-appointed Chinese kitchen differs from an American kitchen of the same grade, first in being much cleaner, and secondly in being better provided with apparatus and utensils. Moreover, the utensils are better made. Every vessel in which food is cooked is a segment of a sphere.

There are no angles or corners in which grease or dirt can gather. Neither are there shelves and boxes in the kitchen where the smaller tools may be put away. Everything is hung up, and a single glance around shows the spotless cleanliness. The Chinese boil food by the use of superheated steam, which gives better results than boiling in water. Another feature is the stove, in which fuel is used with lavish disregard of its cost. The stoves are peculiar to our eyes, for the fire is built outside of them as often as inside, the heat being drawn directly from the flame, through what we would call the oven, to the flue. This gives a smoky flavor to the meats which are roasted in the oven, and the smoky flavor is accounted good, while the oils of the smoke tend to preserve the meats.

Shelving and Numbering Repairs.

A friend in the trade recently wrote us for the best plan for shelving and numbering repairs, and while it may be an open question as to which of the many schemes adopted by the many manufacturers and dealers is the best, we describe a plan furnished by a manufacturer, which may be considered worthy of imitation by those whose present method is not so practicable. Our correspondent says:

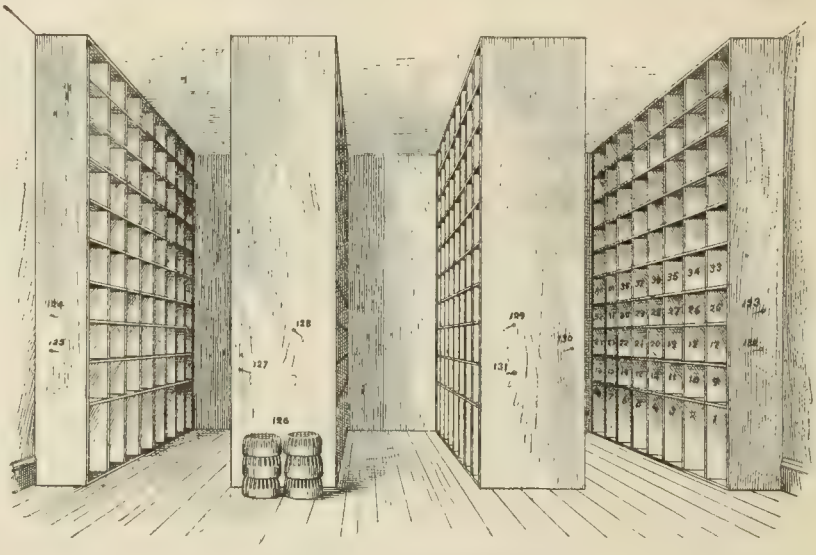
From the slovenly manner in which repairs are often kept by some dealers I should judge it to be a part of the stove business which is considered of secondary importance by most people, for little time and money are spent in the construction of suitable shelving or in the observance of a good system for keeping track of stocks on hand. There are, in fact, a thousand and one different ways of keeping repairs, according to the volume of business done in them. In many house-furnishing goods and hardware stores space is left on the floor under all platforms and shelving in which to poke repairs, and, while this plan may be the most economical so far as room is concerned, especially where it is limited and the business in repairs small, it cannot be recommended as desirable on any other grounds, as the repairs cannot be readily seen and it is back-breaking work to get at them. Some houses have all such repair pieces as will pile up placed about on the basement floor. They stack them in rows, with aisles between, and odd-shaped pieces they keep on shelves; but this simple method is not worth imitating by anybody who desires a good system in all departments of his business and is disposed to confine all his merchandise to the smallest space consistent with convenience in handling. But small dealers generally will naturally be apt to improvise means for taking care of repairs acording to the quantity they handle, their importance and the size of their store; that is to say, they put up shelves in their store in recesses or corners or in any space that cannot be advantageously devoted to the display or storage of more valuable merchandise. The plan I present here is intended more for larger dealers and jobbers and manufacturers, who carry anywhere from 50 to 100 tons of repairs and are obliged to devote entire lofts or basements to that department.

BINS FOR REPAIRS.

It is first necessary to build the bins, and it is perhaps needless to go into detail as to their construction, except to say that the boards used should be good and heavy; made out of 1¼-inch plank. Nearly all might be made of one size, say 16 inches high, about 16 inches wide and 21 inches deep, inside measurement, and a few cross partitions put in afterward for smaller bins to accommodate smaller articles, and inserted in such places as may be handiest, according to the quickness or slowness of sales of such articles. The first tier of shelves should start about 2 feet from the floor, leaving high bins at the bottom to pile up range bricks or to put tops, bottoms, backs and fronts, which would require larger space than grates, &c. In the basement or loft of any ordinary building 25 feet wide, bins 21 inches deep can be constructed on each side wall, and two sets of bins of double that depth in the center, with aisles between of ample width to swing a hand truck.

After providing all the bins, they should be numbered, and also a number given to any open space; any passageways or corners of the apartment, in which fire pots or extra large and heavy pieces may be kept, which on account of their weight and size, cannot be cared for in bins.

Every dealer must make his own "layout;" that is to say, decide what bins will be the handiest for the repairs most often called for.



Shelving for Stove Repairs.

INDEX BOOK.

Before piling them away he should provide himself with a well-bound index book of about 200 pages, ruled to give about 40 horizontal lines on each page, and about 12 columns for sizes, and a margin at the left for name of pieces, as follows:

Name of stove.

Name of repair parts.	Numbers or sizes of stoves.												Numbers of bins or corners or places where repairs are kept.
	6	7	8	9									
Grate, bottom.													
Grate, front.													
Grate rest.													
Bricks.													
Top.													
Bottom.													
Back.													
Front.													
Covers.													
Cross piece, long.													
Cross piece, short.													
Pipe collar.													
Top oven.													
Bottom oven.													
Fire oven.													

Then as the repairs are put away insert in book on the proper page containing the name of the stove, and opposite the name of the piece and under the number indicating size, the number of the bin where the piece was put.

It will probably be found that 40 horizontal lines will be all that are required for the pieces of any stove or range, and, of course, a good many

plain constructions will require the writing in the names of but a very few pieces, as well as some old stoves, of which only a few parts for repair are kept in stock.

So far as the vertical columns are concerned, there are no cooking constructions made under a certain name of as many sizes as there are columns, and that number of columns will also be found sufficient for any heating stove, even with the varieties of tea-kettle attachment and revertible flue.

The only labor connected with the plan is at the start. As each new stove makes its appearance or new repairs are kept, it is but little trouble to write the names of the pieces in the book, and insert the numbers of the bins where the pieces are kept and the reference is made. It is, of course, necessary to give a number to every place, shelf, corner or hook where anything is kept. If turnbuckles or small lugs or draft slides are kept on wires or hung up, for instance, in the passageways between the sections of bins, on nails driven in the boards forming the abutment of the section, the spot where they hang should be numbered. Fire pots piled up against a wall should have a number.

If this plan is followed thoroughly at the start and kept up when new goods are added, anybody around the establishment can find a casting wanted without being entirely dependent upon the repair man. There is no doubt that many large concerns have been bothered when they have lost the services of the repair man, who may be the only person around who knows where to get certain repairs, and there is no good reason why any well-regulated concern should not have as good a system in this department of the business, and one to give the least bother when clerks are changed, as in any other.

Electric Cooking.

In a paper on "Electric Heating," read before the Chicago Electric Club Carl K. MacFadden made the following remarks on the application of electricity to cooking purposes:

Since electric heating has been taken up so successfully on electric roads, the fact also presents itself that there would be a large field in cooking devices to be operated by currents of standard voltages to-day used in lighting. A few electric stove companies have at present good lines of cooking utensils which surely fill every want for reliability, cleanliness and good design. There are many cases, especially in the smaller sized cooking utensils, where electricity can compete with coal. A small tea kettle, taking 250 watts of current, will furnish boiling water in a few moments by the simple turning of a switch. An "afternoon tea" can be given, the cost of current being but a few cents. There would be no need of fires being lighted with the necessary dirt and attention, but the cooking utensils could be placed, you might say, on the parlor table, with no visible connection to a source of heat with the exception of a silk-covered conducting cord. The use of electricity in the kitchen reduces the art of cooking to a science. It is an easy matter to determine just how many minutes it will take to cook a certain dish with a current of a certain predetermined strength. This method leaves nothing to be guessed at, and, of course, the current may be cut off and all expense stopped the instant that the cooking is completed. With coal stoves this is an impossibility, and fires have to be started long before you are ready to use them, and the waste of fuel goes on even after the work is done. It would be a pleasant thought winter mornings for the lazy man to know that his kitchen fire was a thing of the past, and that the fire that would cook his morning meal had been started long before in the power house; that it was only a question of throwing a switch and waiting a minute or so for his electric culinary apparatus to be in condition for cooking. As to the exact pecuniary value of his comfort thus obtained, that is, of course, mere conjecture, and would have to be answered by the man in question.

There are, of course, a vast number of plants throughout the country that will not furnish current at a rate which would allow electric cooking apparatus to be used, provided it was simply a question of coal costing so many cents per hour and electricity a few cents more.

ODD PLATES.

The Ridgway Furnace Company, 76 Union street, Boston, Mass., have had gratifying success with their 1893 furnace, sales for the first half of the year showing a gain of two-thirds.

Spite of "financial stringency," "trade depression," "scarcity of currency" and other favorite terms which are becoming familiar to our ears as household words in the daily reports of the business situation, Sam S. Utter says this has been the best year for gas and oil stoves that he has seen yet. Business has been booming with him up till quite lately, and though a trifle dull just now, there is a prospect of lots more of it ahead. Sam is now engaged in perfecting a new parlor oil stove, which he thinks will beat all former efforts. We shall hear more of this anon.

F. M. Borden of Philadelphia has left stoves and stove repairs behind and is enjoying the sights at the White City in company with his wife.

An oil heating stove in which the parts are so arranged that the air is fed through the burner and made to rise through a vertical tube in a heated condition has been patented by Carl Brandt of Cedar Falls, Iowa. The arrangement is such that the air is fed downwardly through a spiral coil outside of the vertical tube to the exterior of the stove at one side, while at the same time an inflowing current of air from the bottom of the stove moves upward through and around the said parts and out at the top in such a way as to quickly warm the room and equalize the temperature.

The Foster Stove Works of Ironton, Iowa, resumed operations week before last, after the usual shut down for repairs, alterations, &c.

J. E. Frenning of S. M. Howes Company, 40 to 46 Union street, Boston, Mass., has gone to Maine for his annual vacation.

The Turner Zephyr Stove Company of Indianapolis, Ind., have been organized with a capital stock of $20,000. The directors are A. F. Kleinschmidt, William Henry Turner and William Hyde Turner.

Pursuant to an order of the Supreme Court John Gutmann, receiver of the Albany Stove Company, Albany, N. Y., offered for sale, at noon on Tuesday, August 15, the real estate, buildings, machinery, tools, implements, &c., excepting the manufactured stoves, castings, office furniture and nickel plant of the company. The receiver announced that there was a mortgage of $10,000 given to secure payment of notes, and that the terms of the sale were 10 per cent. down and the balance within ten days. There were but few persons present at the sale, and as no one made a bid the receiver, after consulting with his attorney, announced the sale postponed.

We are indebted to John Hobrecker, Jr., Omaha, Neb., for a copy of a 120 page catalogue which he has issued, showing some of the leading lines of stoves, ranges and heaters which he handles as agent. The list includes goods made by the March-Brownback Stove Company, Pottstown, Pa.; Duffy-Trowbridge Stove Company, Hannibal, Mo.; N. G. Galusha, Rochester, N. Y.; Cleveland Steel Range Company, Cleveland, Ohio; Leibrandt & McDowell Stove Company, Philadelphia, Pa., and the Joseph Bell Stove Company, Muncie, Ind. In the announcement to the trade it is stated that in 1889 Mr. Hobrecker started business in a room 20 x 35 feet, since which time trade has increased to such an extent as to necessitate removals and enlargements, until at present he occupies nearly all of the commodious building at 1007–1011 Jones street and represents nine large manufacturers, six of whom produce complete lines of cast or steel goods. As it is impossible to carry in stock full lines of all the goods manufactured, those sizes which it is necessary to ship from the factory on special order are indicated in the catalogue by a star. Mr. Hobrecker is also Western agent for a line of vapor goods and carries in stock a full assortment of hollow ware, refrigerators, stove boards, coal hods, shovels, repairs, &c.

On the 20th inst. the Quick Meal Stove Company of St. Louis laid the corner stone of their new manufactory, which will adjoin the present plant on Chateau avenue. The ceremonies were brief. The daughters of President C. A. Stockstrom and Secretary Louis Stockstrom performed the ceremony of laying the corner stone A tin box containing the usual articles employed on such occasions, copies of the St. Louis papers, coins, &c., was deposited by the two young ladies, and the following day the work of erection was practically begun. The building will be a four story structure 59 x 140 feet, and will be built on the latest slow combustion principle. The present season has taxed their works to the full capacity, and it is expected that the addition referred to will enable them to keep abreast with their orders next season better than they have been able to do during the past three months. Notwithstanding the general business depression throughout the country, this concern are in receipt of carload orders, which, as most manufacturing establishments are aware, are very scarce these days. Their sales during the present season, will, it is expected, show an increase of something like 30 per cent. over last year's trade.

The Dangler Stove & Mfg. Company of Cleveland, Ohio, are the assignees of a patent granted to Henry Ruppel for burners intended for use in connection with gasoline or vapor stoves. The burners are constructed with a series of perforated and non-perforated chimneys, so arranged in

connection with a hood and center funnel-shaped cap that the heat is concentrated toward the center of the burner, thereby creating, it is claimed, an intense heat, which is spread by means of the cooking utensils being placed above and over it.

According to a recent issue of the Louisville *Times* the foundry of the Bridgeford Stove Company of Louisville, Ky., has ceased operations for the present in order to make necessary repairs. It is stated, however, that the suspension of operations this year will be for a longer period than usual, owing to the depression in business and the fact that the company have a large stock of goods on hand. The paper named is authority for the statement that the officers of the company have not yet decided when oprations will be resumed, but intimate that they are not likely to until some of the stock has been worked off.

In the issue of the Detroit *Evening News* of August 16 appeared an interview with George H. Barbour of the Michigan Stove Company relative to the financial situation and the condition of affairs at the company's works. Among other things he is reported to have said: "At present we are running three days in the week with the mounting department, the other departments running light. Early next week we hope to find the financial condition in such shape that we can resume in full All is looking very favorable at present to that end. Our idea is to keep our men at work, and we are willing to take a share of the risk ourselves. The main point in the financial condition here is to have the savings bank depositors regain confidence and not draw out any more than the necessities of the case require. That confidence being restored and the banks relieved, the money will get into circulation and business will be promptly resumed."

The Littlefield Stove Company of Albany, N. Y., have issued an advertising novelty in the shape of a memorandum book of a size and shape convenient to be carried in the vest pocket. The covers are devoted to an illustration and a statement relative to the four important features embodied in the construction of the West Shore range. There is also given a calendar for the year 1893 and some remarks relative to the s ove named.

The Joliet Stove Works of Joliet, Ill., send us copies of circulars which they are mailing to the trade. One re lates to Moore's Fidelity range, which is made in 18 styles and sizes, and adapted for soft coal or wood. It has a large square oven, ample fire box, fit ted with the company's new automatic ally working soft coal grate and large plain draw hearth, under which is a capacious ash pan. The flues are roomy and especially adapted for soft coal. The ornamentation of this stove is of a striking character, the oven door carrying a handsome carved nickeled plate with tile ornament, while the door over the hearth is embellished with nickel in a pleasing manner. The second circular before us illustrates and describes Moore's Air Tight heater, a parlor stove of graceful proportions and rich and effective ornamentation. The construction and design are fully covered by letters patent, and the stove is referred to as being economical in the use of fuel, satisfactory in operation and may be run red hot without injury. Every stove has a double heating attachment, so that more than one apartment may be heated if desired. H. Leonard & Sons of Grand Rapids, have been appointed State agents for the sale of the company's goods in Michigan, while Baker & Myers of Cleveland have been appointed State agents for Ohio.

The Edwards Parlor Lamp Stove Company, 9 and 11 North Canal street, Chicago, Ill., are sending out a very neat circular or folder relating to their goods. The lamp stove is such that it can be used as a heater or, by removing the dome top, it can be employed for cooking purposes. It is made in two sizes, is finished in nickel plate, highly polished, and is claimed to operate without odor, smoke or soot.

J. H. Osmond of 156 North Seventh street, Philadelphia, Pa., sends us a circular of the Rival Portable furnace, patented in 1875 and improved last year. The heavy wrought iron radiator is so constructed that the heated gases are thrown against the outside and top and then pass down one drum and up the other before escaping to the smoke pipe. The fire pot is heavy, the grate is of the shaking and dumping type, operated by an upright lever, and the base is open all around for the admission of cold air. The water pan is at the back where a large manhole door allows the examination of the interior parts and permits the drum to be taken out and new ones put in without dismounting the furnace. The manufacturer states that the construction of the heater is such that before escaping into the chimney the products of combustion are retained within the furnace until their heat has been fully utilized.

The Danville Stove & Mfg. Company, with works at Danville, Pa., and branch houses in Chicago, Baltimore and New York City, are sending out a little pamphlet in which is illustrated and fully described the Beaver steel plate furnace. Special reference is made to the ash pit, the triplex grate, the fire pot, the dome, the double steel cylinder radiator, dust flue, check damper, feed doors, &c. Several reasons are given why the Beaver is the best, and directions are presented for operating and setting the heaters which are made under this name. Various tables relating to pipes, registers, &c., constitute valuable features of the pamphlet.

Graff & Co , 208 Water street, New York, who shut down their foundries July 1, as customary at that season of the year, for repairs, found they had a large stock of goods on hand. Since that time they have worked off most of it and were obliged to start up again August 21. Their experience has been that up to July 1 their trade was fully as good as usual and better than for the corresponding period of the preceding year. They say now the demand is as good as a year ago, although such as relates to building operations is behind in volume.

The Schneider & Trenkamp Company of Cleveland, Ohio, favor us with a copy of an illustrated catalogue of Reliable gas heaters, parlor grates and radiators. The pamphlet is made up of 40 pages of letterpress, bound in covers of deep blue with side title in old gold. The fourth page of the cover is embellished with a bird's eye view of the company's works at Cleveland. The first thing to which the attention of the reader is invited is a short chapter on gas fires and stoves, in which are presented some remarks by Dr. B. W. Richardson. Following this are general directions for operating and caring for Reliable heaters, after which are given numerous illustrations of the goods. The heaters are made in different sizes to meet varying requirements and range in size from those measuring 6 inches in diameter up to those of 12 inches. A telegraphic code for ordering goods by wire is a feature of the closing pages of the pamphlet.

For his five years' drift across the Arctic regions Dr. Nansen takes with him an oil stove which, at a cost of four cents, will, it is said, cook as large a dinner as any party of 20 could eat.

Novel Diseases

Modern facilities for rapid locomotion appear to be bringing in their train a whole string of brand new diseases which were unknown to the medical faculty a few years ago. One of these, the *kyphosis bicyclistarum*, or "bicyclist's stoop," is now a well-defined malady which has taken its place permanently in pathology. The cable car is reported to be responsible for another and entirely novel disease, from which a conductor in Philadelphia is now suffering. This is known as *cellular opestacitis*, or "bell arm." The man's case, as described in a Quaker City journal from the records of the hospital where he is being treated, is a curious one. He is a conductor on the foremost car of a train of three, and the habitual custom of listening for the sharp "ting ting" of the bell on the rear car, followed by the mechanical movement of the arm toward his own bell strap, has developed this strange ailment. This muscular movement has become a second nature to him, and his arm actually acts more quickly than his brain. To such an extent has this involuntary action gone that whenever he hears a bell of any kind his arm at once shoots upward toward an imaginary bell cord. The physicians at the hospital were greatly puzzled to account for this at first, but the case has finally been diagnosed as one of *cellular opestacitis*.

A third disease developed of late years, which is attributable to modern causes, is the "tennis shoulder," from which the devotees of that game are often found to suffer. There is much truth in the opinion of a distinguished surgeon that the conditions of our present high civilization are directly responsible for the majority of ailments that modern flesh is heir to.

The cyclonic storm that swept over the State of New York and other parts of the Atlantic coast on Wednesday and Thursday seriously injured the apple and corn crops. Short supplies for canners will, it is feared be the result.

A St. Louis dispatch of August 24 reports the destruction by fire of the entire plant of the Western Brass Mfg. Company of that city. The loss is estimated at $165,000, about three-fourths of which is covered by insurance.

Telephone messages have been successfully transmitted over wire fences in Australia.

THE RETAIL STORE.

Retail Dealers' Protective Association.

The following call for a meeting of the retail Hardware dealers of the United States to discuss the advisability of forming a National Protective Association and other matters of interest to the trade has been issued by S. S. Bryan, secretary of the Pennsylvania Retail Hardware Dealers' Association:

To the Retail Hardware Trade of the United States:

Feeling that the time has arrived when some action is necessary to protect ourselves as retail dealers in Hardware from the inroads which manufacturers and jobbers are making on our trade, we invite you to be present at a meeting of the Retail Hardware Dealers of the United States, to be held in Chicago, Wednesday, September 20, 1893, the exact place to be hereafter named. At this meeting will be discussed the advisability of forming a protective association, and other matters of interest to the trade.

The attendance at this meeting will in no way commit you to join if you do not see proper.

ORR & LOCKETT HARDWARE COMPANY, Chicago, Ill.
BULLARD & GORMLEY, Chicago, Ill.
HODGE & HOMER, Chicago, Ill.
S. J. STEBBINS, Chicago, Ill.
DAVIS, HUNT & CO., Cleveland, Ohio.
NORTHWESTERN HARDWARE COMPANY, St. Paul, Minn.
W. K. MORISON & CO., Minneapolis, Minn.
STEBBINS & CO., Rochester, Minn.
MOUND CITY HARDWARE COMPANY, St. Louis, Mo.
IRVING A. SIBLEY, South Bend, Ind.
SPRINGFIELD HARDWARE COMPANY, Springfield, Ohio.
TALLMADGE HARDWARE COMPANY, Columbus, Ohio.
J. B. KAERCHER, Pittsburgh, Pa.
SAMUEL MCKNIGHT, Allegheny, Pa.
STEINER & VOEGHTLY, Allegheny, Pa.
A. B. NEYHART, Williamsport, Pa.
J. P. FRAZIER, Franklin, Pa.
C. J. KIRK, New Castle, Pa.
H. W. PICKETT, Warren, Pa.
M. H. CLARK, Jamestown, N. Y.
D. C. WELLER, Erie, Pa.
D. ARTHUR GILL, Meadville, Pa.
JOHN S. LESLIE, Sharon, Pa.
R. L. KERNOCHAN, Titusville, Pa.
S. S. BRYAN, Titusville, Pa.

It is desired to have as large a representation as possible. It is especially requested that all who expect to attend will notify at once Wm. T. Humes, care Orr & Lockett Hardware Company, Chicago, Ill., in order that proper arrangements can be made for the meeting.

If for any reason you are prevented from attending, please send in your name for enrollment should it be deemed wise to organize. This will be a great assistance to those having the matter in charge.

JOHN Y. COOPER, 709 South Cherry street, Nashville, Tenn., writes us that he expects to engage in the business of repairing and fitting up stoves at an early date, and wishes to hear from manufacturers of stove pipe blanks, asking that they mail him circulars illustrating and describing their patents, with net prices.

Alaska Stove-Lid Lifter.

Troy Nickel Works, Troy, N. Y., are putting a new style of lifter on the market, as illustrated herewith. In construction the lifter is similar to others of their make, having a spiral wire handle, with a ring upon the end for hanging it up. The manufacturers claim for the lifter durability, fine finish and that it is always cold.

Alaska Stove-Lid Lifter.

MERIDEN BRONZE COMPANY have now on exhibition at their New York showrooms, 30 Park place, a handsome line of various kinds of Lamps, many of which have been prepared for this season's business. They are of medium and higher grades, suitable for fine trade. A good assortment of Vases has been imported for use as standards in Lamp mounting, and are now ready. The Lamps have been made up in numerous finishes and designs, those in gold and silver plate predominating, with many trimmed with onyx. A generous supply of art goods, including onyx and gold Tables, &c., can also be seen.

No. 0 Square-Lift Fire Department Lantern.

R. E. Dietz Company, 60 Laight street, New York, and 25 Lake street, Chicago, are putting the above lantern on the market, as illustrated herewith. It is made of brass in a substantial manner, particularly adapted to the use of fire departments. The lantern has a square-lift movement, and a conveniently shaped brass handle. A feature of the lantern is a wind-brake guard, represented in the cut by the band located near the top of the chimney. The band is attached to the side strips to which the wire guards are fastened. These strips, with wind brake and wires attached, slide on the upright square tubes, the whole being held in place by a spring push connected with one of the square tubes. This permits the chimney to be removed for cleaning, &c. In this connection the manufacturers state that they continue making their all-tin fire department lantern; also the tin one with copper oil pot, for fire department use.

No. 0 Square-Lift Fire Department Lantern.

A Brooklyn citizen is said to have dispensed entirely with coal in his house, and all his household operations are now performed by electricity. The house is lighted by electricity; and the cooking is done and all water heated by electricity; in summer the house is cooled by electric fans; in winter it is warmed by electric heaters. The work of ironing is done by electric irons, and whenever power is needed electric motors are employed, as for running a sewing machine, or in laundry operations.

A technical school is to be established at Osaka, in Japan, for the training of youths in various handicrafts.

TRADE REPORT.

The Iron Market.

In the Iron trade the general impression is that we must face a protracted period of low prices and only slowly expanding volume of business. The fact that a number of important plants are being operated by receivers in itself is regarded as likely to have an adverse effect. There is a growing feeling that the system is unjust to solvent concerns, since the competition is unfair.

Another factor which is pointed out as likely to hold down values is that mill after mill will make special efforts, as a preliminary to resumption, to secure good "backbone" orders, which are usually relied upon to secure at least partial employment for a series of months. This is particularly true where specifications must first be received before operations can begin.

In staple articles, distributed widely and in small quantities, where, therefore, stocks play an important part, the reserves of this character have been drawn down to a very low point. It is in these lines that the necessities of consumers are even now being felt and in which an upward tendency may be first expected to develop.

The outlook for raw materials like Ore and Coke looks gloomy, because in them the unprecedented dullness in the Rail trade, with its important tonnage, tells most.

Pig Iron.—In the New York market practically those who must sell in order to meet engagements are in control. Some very low offers have been made by Southern furnaces, and have to some extent been followed by Northern makers. It is hinted that those in control of the management of some of the Standard Eastern Pennsylvania makes are considering the question of lowering prices. We quote Northern brands $14 @ $15 for No. 1; $13 @ $14.25 for No. 2, at tidewater. Southern Iron, same delivery, $13.25 @ $14.25 for No. 1; $12.25 @ $13.25 for No. 2; $11.50 @ $12.25 for No. 3; $11.75 @ $12.25 for No. 2 Soft, and $12.25 @ $13 for No. 1 Soft.

The movement of Pig Iron is reported as extremely light in the Philadelphia district, and while quotations are nominally unchanged, there is no difficulty in securing special rates for special terms. That is to say, cash or short-time buyers can shade prices 25¢ to 50¢ ℔ ton; but on ordinary time sales quotations are pretty well maintained. Sales are all in small lots, there being no disposition to buy in advance of requirements and no possibility of marketing large lots unless on terms which holders are not willing to accept. Ordinary time sales are usually at about $13 @ $13.50, delivered, for Plain No. 2, $13.75 @ $14.25 for No. 2x and $14.50 @ $15 for No. 1x.

Production of Pig Iron in the Pittsburgh district has been further lessened by the banking down of other stacks. A very small amount of Iron is selling, but with increased activity among some of the mills it is thought demand will show a great improvement before a great while. Meanwhile, quotations are given as follows:

No. 1 Foundry	$13.00 @	$13.25	cash.
No. 2 Foundry	12.00 @	12.25	"
Charcoal Foundry No. 1	15.00 @	16 00	"
Charcoal Foundry No. 2	14.00 @	15.00	"

Very few transactions are noted from Chicago, but among them was a sale of 300 tons Lake Superior Charcoal. This would not usually be worth mentioning, but in the present state of the market is of some importance. There is considerable inquiry for Coke Pig from country trade, but only in a general way. Consumers seem merely to be keeping in touch with the market so that they can close quickly in case they should suddenly need Iron, as they are running with very light stocks. Now that production has been so heavily reduced, many are fearing a sharp reaction from dullness as soon as financial questions are settled. The Malleable Castings syndicate will need from 40,000 to 60,000 tons of Lake Superior Charcoal, and the members of the trade are wondering where they will get it, as the stock furnaces are pretty well sold, and very few furnaces are running or expect to run. The quotations given below are subject to concessions for prompt cash and immediate shipment:

Lake Superior Charcoal	$16.00 @		$16.25
Local Coke Foundry, No. 1	13.50 @		14.00
Local Coke Foundry, No. 2	12.75 @		13.00
Local Coke Foundry, No. 3	12.50 @		12.75
Local Scotch	14.0 @		15.00
Ohio Strong Softeners	15.75 @		16.25
Southern Silvery, No. 1	@		14.50
Southern Silvery, No. 2	@		14.00
Southern Coke, No. 2	12.60 @		12.85
Southern Coke, No. 3	12.10 @		12.25
Southern, No. 1, Soft	12.60 @		12.85
Southern, No. 2, Soft	12.00 @		12.25
Tennessee Charcoal, No. 1	16.00 @		16.50
Alabama Car Wheel	@		18.85
Hocking Valley, No. 1	15 25 @		15.50
Jackson County Silvery	16.50 @		17.00

Reports from Southern markets show little, if anything, of an encouraging nature in the Iron trade, and while the volume of business is exceedingly light, lower prices have been accepted for Southern Irons than ever before. There is some little inquiry for miscellaneous forward delivery, but it is not entertained on any such basis. Some factories are not offering to sell Pig Iron at all, but are devoting their energies to settlements. Pig Iron can now be bought at such low prices that it is worth the effort of all who will require it in the early future to secure it now. Quotations are as follws:

Foundry.

Southern Coke, No. 1	$12.75 @		$13.00
Southern Coke, No. 2	10.75 @		11.00
Southern Coke No. 3	10.25 @		10.50
Ohio Soft Stone Coal, No. 1	15.50 @		16.00
Ohio Soft Stone Coal, No. 2	14.50 @		14.75
Lake Superior Coke No. 1	15.00 @		15.25
Lake Superior Coke No. 2	14.00 @		14.25
Hanging Rock Charcoal, No. 1	18.50 @		19.00
Hanging Rock Charcoal, No. 2	17.50 @		18.00
Tennessee Charcoal, No. 1	14.00 @		14.25
Tennessee Charcoal, No. 2	13.00 @		13.25

Car Wheel and Malleable Irons.

Standard Southern Car Wheel	17.75 @		18.00
Lake Superior Car Wheel and Malleable	17.00 @		17.25

Metal Market.

Pig Tin.—Despite a steady downward movement in London that resulted finally in about £1 ℔ ton decline in prices, there has been a quite sharp advance in the New York market, with August delivery moved up to 18.80¢ ℔ lb early in the week, against 18 30¢ a week ago. At the close, however, the price for spot stock receded to 18.65¢. The London price, with duty added, would make the cost of importation several cents above local selling rates and fluctuation in the foreign market, therefore, has had little or no direct influence. One thing is evident, that English market prices are gradually slipping down to a point at which Tin may be shipped thence to this country with profit, although they must melt considerably still to meet prices current in this market, where a margin of about 2¼¢ ℔ lb remains now in favor of local holders. The supply on this side, however, is slowly but surely decreasing, and this cause it is which has probably induced the anxiety to sell for October and later deliveries indicated by the reduction in the margin of difference between prices for current month and later deliveries in this market. Purchases by dealers and consumers have been on a very moderate scale, and the market in general may be described as dull and heavy.

Copper.—Somewhat unusual conditions have prevailed the past week and the market has been very uneven in consequence, with the final outcome such as would indicate that best efforts in the direction of maintaining prices have been futile. Considerable Copper of one kind or other has been taken for shipment to Europe and the report has circulation that surplus stocks of a prominent producer have been about all cleaned up. Against this is a well-authenticated report that a number of

home consumers, after deferring acceptance of Copper tendered on contracts, finally canceled the same and settled by paying differences between original purchase prices and 9½¢ for Lake Superior Ingot, 9½¢ for Electrolytic and 9¢ @ 9¼¢ for ordinary casting brands. Those figures subsequently came out as a reflection of true market value, and in connection with offers on the Metal Exchange at 9.60¢ for October–November delivery imparted a weak undertone. For the moment the market is a very uncertain one, with general financial conditions a drawback that offsets the intended effect of reduced production and quite heavy exports. Such demand as exists from home consumers is for just so much as they imperatively require, and sales are almost entirely in small lots, there being a marked disinclination to stock up ahead in view of the present peculiar position of the metal. A slightly better feeling is, however, reported by jobbers as having developed during the past few days, and the situation is by no means regarded as without hope. Prices for small lots firm and unchanged, at 11¢ for Lake, 10½¢ for Ansonia grade Arizona, and 10¢ for casting.

Sheet Copper.—The completion of some large building operations in various parts of the country, which were so far advanced as to be comparatively unaffected by the existing stringency, has called for supplies of Cornice Copper to a very fair amount. Otherwise the market is dull, although something of a better feeling has been observed during the present week, in a slight increase of orders, well distributed, and considerably more inquiry. The fact is that consumers' stocks are so generally depleted that they are now forced to purchase in order to supply current needs, and this gives a fair movement to jobbers' business. An improvement is also noticed in collections.

Pig Lead.—Prices for common domestic have moved up from 3.30¢ to 3.45¢, with transactions of less than 1000 tons here during the week, and the market closes very firm. The last sales were at the highest price and involved about 300 tons, while 3.50¢ was bid for one or two carloads on the spot. It was reported on Thursday by a large Eastern consumer that no prices could be obtained from Western smelters. Curtailment of output in the West and very light receipts of Mexican Silver Lead Ores figure with some prominence as factors in bringing about the advance. Stocks at headquarters are reported as being very low, and jobbers do not anticipate a very bright future. The retail demand has slacked off somewhat during the past week or two. For small quantities the price remains firm and unchanged at 4¢ for American Pig, and 4½¢ for Bar Lead.

Lead Pipe and Sheet.—A very moderate demand exists. The setback in the building trade caused by the difficulty of obtaining money, which has caused the completion of many building operations to be postponed or curtailed, has been felt in a shrinkage of orders for plumbing goods. Prices are firm at the former quotations.

Spelter.—Ordinary brands of Western have been offered at as low as 3 70¢, delivered here and in this vicinity, without stimulating business. Some brands that are rather above the average may be secured at 3.75¢. In short, the market is weak and dull, with little sign of probable turn for the better in the immediate future unless production be considerably curtailed. The price for small lots has receded to 4½¢ @ 4¾¢, with a probability of these figures being shaded for advantageous cash offers.

Sheet Zinc.—Market dull and lifeless. There is no buying except in very small lots for immediate use. Price ℔ lb for less than cask, 7¢, nominally.

Antimony.—Sales are moderate, but the business passing is at about former prices. We quote at 9¾¢ @ 9⅞¢ for Hallett's, 10⅛¢ @ 10¼¢ for L. X., and 10⅜¢ @ 10½¢ for Cookson's in round lots.

Tin Plates.—Light weight Cokes for prompt delivery have met with somewhat better sale, the demand coming principally from Southern canners who had not stocked up sufficient to meet their requirements for the favorable tomato crop. Some inquiry is also reported in more than one quarter both for spot goods and future delivery, probably encouraged by the more favorable legislative outlook at Washington, and also due, no doubt, largely to the curtailment of Welsh production, which has been very marked during the past week. Otherwise no great improvement is perceptible. The generally fair demand for domestic Ternes continues, although not to the extent that was anticipated for this season, or that would have developed had the monetary situation been more favorable. Prices, meanwhile, although no higher, are steadier than they were a week ago, and it is thought they will not easily drop again. Nevertheless, for spot cash and good amounts it would not be difficult to still obtain material concessions on published quotations. Large buyers are still holding off laying in any heavy stocks and even those who must have considerable quantities of Tin Plates early next month are deferring their purchases, probably waiting for the definite action of the legislature on the Silver Purchase Repeal bill. Jobbers in the city, while looking after old customers, do not appear anxious to fill Western orders just at present. A London cable of August 23 reports: A moderate business in Tin Plates, although the enforced closing of works in consequence of the coal strikes hampers business. Makers are firmer on prices, but buyers are unwilling to respond. Canadian business continues good, but is the exception. 'Frisco purchases are not up to the average. Stocks at Swansea amount to 236,000 boxes, against 268,000 boxes last week. Liverpool prices are as follows:

IC Charcoal, Alloway grade	12/9 @ 13/3
IC Bessemer Steel, Coke finish	11/9 @ 12/
IC Siemens " " "	12/0 @ 12/3
IC Coke, B V, grade, 14 x 20	11/6 @ 11/9
Charcoal Terne, Dean grade	11/6 @ 11/9

Sheet Iron.—The demand for Black Sheets shows little or no improvement. Prices are weak, and stocks ample. therefore to those who will require this material in the near future the present appears a good time to purchase stock. Galvanized Iron is in good demand, and prices are stiffer. It is thought more than likely that an advance in price for this material will be announced within a few days, as stocks are dwindling materially and many mills are shut down, while the demand increases. At the same time, a number of the closed mills are ready to start up again at short notice and any lack of material would be very speedily filled.

Chicago Report.

Scrap.—Dealers are almost refusing to buy any more old material. For such as they accept they pay the following prices:

	Per net ton.	Per lb
No. 1 Wrought Scrap	$8.00	....
Machinery Cast	6.00	....
Malleable Cast	6.00	....
Stove Plate (free of burnt)	5.00	....
Burnt Iron and Grate Bars	4.00	....
Sheet Iron and Hoops	3.00	....
Plow Steel and Breaking Stock	6.00	....
No. 2, such as Shovels, Hoes, &c	4.50	....
Old Boilers—whole (Iron)	6.00	....
" (Iron)—cut in single Sheets and Rings	9.00	....
Old Gas-Pipe and Boiler Tubes	5.00	....
Cast Borings	3 50	..
Turnings	5.00	...
Horseshoes	9.00	....
Copper Bottoms	....	5½¢
Copper Clips and Heavy	....	6½¢
Heavy Brass	....	6 ¢
Light Brass	....	4 ¢
Pipe Lead	....	2½¢
Tea Lead	....	2 ¢
Zinc	....	2¼¢
Rubber	....	2 ¢

Anthracite.—The market is very quiet, but prices are firmly held. Carload lots of 12 net tons or over are quoted as follows:

	Grate.	Egg, Sto. and Ch.
Chicago, Ill	$5.85	$6.10
Milwaukee, Wis	5.85	6.10
Kansas City, Mo	9.05	9.30
Council Bluffs, Iowa	9.05	9.30
Lincoln, Neb	9.20	9.45
Sioux City, Iowa	9.05	9.30
Aberdeen, S. Dak	9.10	9.35
Dubuque, Iowa	7.15	7.40
Madison, Wis	7.35	7.60
St. Paul, Minn	8.35	8.60
Burlington, Iowa	7.35	7.60
Des Moines, Iowa	8.80	9.05
Davenport, Iowa	7.15	7.40
St. Joseph, Mo	9.05	9.30
Leavenworth, Kan	9.05	9.30
Omaha, Neb	9.05	9.30

Colorado Anthracite.

COLORADO FUEL & IRON COMPANY.	
Denver	$8.00
Pueblo	8.00
Colorado Springs	8.00
Leadville	8.00
Cheyenne, Wyo	10.00
All points between Denver and Missouri River	9.35

CONDITION OF THE

Hardware Trade.

ALL CLASSES OF TRADE are pursuing the conservative policy which they have followed for some time. Retailers and jobbers are ordering only in small quantities to keep up their assortments, and manufacturers continue to curtail their production to the requirements of the immediate future. Many are still closed down, and those who are running are usually on short time. A tendency in the direction of the curtailment of credits is clearly manifested and little effort is making to sell goods, and travelers who are on the road are sending in small orders.

Advices from Chicago.—The orders for Shelf Hardware have recently increased considerably, but they are all small. This shows that merchants are only keeping up assortments and are not yet prepared to order for stock. The larger volume of business from this accumulation of small orders, however, has greatly encouraged the jobbers. They are looking forward confidently to a good trade during the fall months, especially if the currency question is settled by Congress within a reasonable time. Some very conservative jobbers go so far as to predict decided activity in trade after this happens, because crops are good and farmers are in better financial condition than ever before, and will be good customers of the retail Hardware merchants. Stocks in the latters' hands are so light that any demand at all must lead to important buying from jobbers and manufacturers.

Notes on Prices.

Wire Nails.—An improvement in inquiries has been noticed during the week. Stocks in the hands of the trade are light, and still more so in the hands of manufacturers, whose assortments are generally broken. The price is firm at $1.50 for carload lots at mill for any orders to be shipped after September 1, and it is the impression in the trade that if the condition of business warrants it the makers are getting into a position to be able to make a further advance. Small lots in New York are held at $1.65.

Advices from Chicago.—Some Wire-Nail manufacturers report continued good demand, but others are not so favored. Buyers are evidently waiting to see whether the arrangements now being consummated by the makers will really hold them together. The proof of this will be advanced prices maintained rigidly by everybody. Thus far such a condition has not been realized. Some quote $1.60, Chicago, but others have not changed from $1.50. Perhaps the coming week may bring them closer together. Some of the factories have started up part of their machines to fill broken assortments, but there are few, if any, that will run full handed for some time. Jobbers quote small lots from stock $1.55 to $1.60.

Cut Nails.—While transactions have been small there is a noticeable improvement in inquiries. The quotation remains unchanged at $1.05 for carload lots at mill, and although some sales have been made at lower prices, the market is stronger, in sympathy with Wire Nails.

Advices from Chicago.—Cut Steel Nails have not kept up the pace with which they started off last week, but business is not as dull as it was before the spurt. Nails are being called for quite steadily and specifications accompany the orders. Prices are unchanged at $1.20 to $1.25, for factory lots. Jobbers quote $1.30 for small lots from stock.

Barb Wire.—There is little to note in this market, and quotations remain nominally at $2.45 to $2 50 for carload lots at mill for Four-Point Galvanized, with the usual advance for small lots from store.

Advices from Chicago.—Inquries are increasing and manufacturers report many of them resulting in orders. They hope that the dull season has at length ended for this year and that business will steadily improve. Stocks are very light in manufacturers' hands and for immediate shipment they ask $2.50 to $2.60 for Galvanized. Jobbers quote small lots of Galvanized from stock at $2 60.

Kodak Rat Trap.—The Kodak Rat Trap, manufactured by the Waddel Wooden Ware Works, Greenfield, Ohio, which was illustrated in our last issue, is sold to the trade at $2.25 per dozen.

Magic Columbian Lock.—This Lock was recently illustrated in our columns. It is put on the market by the Magic Introduction Company, 321 Broadway, New York, and is sold to the trade at 75 cents per dozen.

Magic Gas Lighter.—Magic Introduction Company, 321 Broadway, New York, are putting this article on the market. The device is sold to the trade at $4 per dozen, or $42 per gross.

Glass.—Developments of the past week have emphasized the fact that the demand for American Glass is not large enough to warrant an early start of the factories, although assortments of single-strength Glass at factories are reported as being broken. A feature of the situation is the selling of foreign Glass by importers at prices under those made by the National Window Glass Company to buyers other than members. This price is reported as being from 80 and 10 per cent. discount to 80 and 20 per cent. discount, according to quantity. The stocks of Plate Glass at factories are being reduced, though the amount of Glass in manufacturers' hands is great enough to supply demands for some time to come. Quotations remain unchanged on all lines of Glass.

Old Rubber.—The market continues dull and weak. What little business is being done is at about the following prices, delivered in New York :

Car Springs, ton lots, ℔ lb.	....	@	$0.03¼
Rubber Shoes, carloads, delivered at factory, ℔ lb..	....	@	.03
Rubber shoes, less than carloads	2¼	@	.03⅛
Large Hose, ℔ ton	....	@	9.00
White Wringer Rolls, ℔ lb.	....	@	.04¼
White Syringes, ℔ lb	....	@	.05

Old Rags, Paper, &c.—The demand has been fair for certain descriptions of Paper Stock. Prices are fairly steady at about the following figures, delivered in New York :

No. 1 White Rags	℔ lb	3½	@ 3¾¢
No. 2 White Rags	℔ lb		.. 1¾¢
Mixed Rags	℔ lb		1 ¢
Blues and 3ds	℔ lb		1 ¢
Hard Sized White Shavings	℔ lb		2½¢
No.1 White Book Shavings	℔ lb	2⅛	@ 2¼¢
No.2 White Book Shavings	℔ lb		@ 1¼¢
Light Book Shavings	℔ lb		¾¢
No. 1 Mixed Shavings	℔ lb		1¢
No. 2 Mixed Shavings	℔ lb		½¢
No. 1 Printed Books	℔ lb	1	@ 1¼¢
Ordinary Mixed Books	℔ lb	½	@ ¾¢
Newspapers	℔ lb		½¢
No. 1 Manila Paper	℔ lb	1	@ 1⅛¢
No. 2 Manila Paper	℔ lb	¾	@ ⅞¢
Bogus Paper	℔ lb	⅝	@ ¾¢
Common Paper	℔ lb	⅝	@ ½¢
Straw Chips	℔ lb	½	@ ⅝¢
Binders' Clippings	℔ lb	¼	@ ⅝¢
Jute Butts	℔ lb		1 1-10¢
No. 1 Jute Bagging	℔ lb		1¼¢
Mixed Bagging	℔ lb	¾	@ 1 ¢
No. 2 Bagging	℔ lb	½	@ ¾¢
Hemp Twine	℔ lb		2¼¢
Manila Rope	℔ lb		2½¢
Jute Rope	℔ lb	1½	@ 1⅝¢
Mixed Rope	℔ lb	¾	@ ⅞¢

Old Metals.—There is small demand for Old Metals, and the market shows little sign of immediate improvement. Prices remain weak and irregular ; the following quotations representing approximately those now ruling in New York :

Heavy Copper	℔ lb	8¾¢
Light and Tinned Copper	℔ lb	7½¢
Heavy Brass	℔ lb	6¢
Light Brass	℔ lb	5¢
Lead	℔ lb	3¢
Tea Lead	℔ lb	2¾¢
Zinc	℔ lb	2¾¢
No. 1 Pewter	℔ lb	14¢
No. 2 Pewter	℔ lb	7¢
Wrought Scrap Iron	℔ gross ton,	$12.00
Heavy Cast Scrap	℔ gross ton,	8.00
Stove Plate Scrap	℔ gross ton,	5.50
Burnt Iron	℔ gross ton,	3.75

Trade Notes.

STRANSKY & Co., 27 Murray street, New York, have recently issued an illustrated price-list of their extensive line of wares. The Cameo Stransky Steel Ware, which opens the volume is shown in various forms : Saucepans of all sorts, Stewpans—Preserving Kettles, &c. Then come Teapots, Coffee Pots of the same material, followed by the Royal Tea and Coffee Pots, made with nickel-plated covers and wood handles and hinges, recently patented. The list of Cameo articles covers over 50 pages, and includes a wide variety of household utensils and house-furnishing goods. At the close are several pages for memoranda, as well as an alphabetical index. All the articles are illustrated, full price-lists being given in connection with the engravings.

J. S. CAPRON, traveling in New England for Dean Mfg. Company, mak-

ers of Tinware, Taunton, Mass., has just returned from the World's Fair and is out among the trade again.

CHARLES THOMAS, 215 West Second street, Elmira, N. Y., issues a four-page catalogue descriptive of the Waugh Circular Shears. On the front page is an illustration of his No. 1 and No. 2 with bevel and squaring attachments. The second page illustrates the No. 3, which is made for both hand and power, while on the third page the No. 5 Circular Shear is represented, this being a heavy, substantial tool from new patterns. The No. 5 Shear will cut circles up to 30 inches in diameter and up to 14 gauge iron or mild steel. The weight is 650 pounds. It is back geared 4 to 1. Brief descriptive particulars are given of these machines as well as a price-list of each.

CUYLER & MOHLER have opened a supply store at 2206 Boston street, Baltimore, Md., and announce their intention of catering to the wants of the mill and machinists' trade. Mr. Cuyler of the above firm has an extended acquaintance throughout the South, where he has traveled for the past ten years for some of the largest manufacturers Mr. Mohler has up to a recent date represented the Magnolia Anti-Friction Metal Company.

THE RECORD MFG. COMPANY, Conneaut, Ashtabula County, Ohio, issue a circular letter under date of August 22, from which we quote as follows: "We believe the worst of the financial scare is practically over. Our wheels have not stopped. Our tin-working and wood-working departments in our manufactory have been kept running, also our Tin-Plate plant. We are on hand to receive your orders for Record's Butter and Lard Packages, Record's Wood Incased Shipping Cans, Varnish Cans, Sugar Makers' Supplies, Sap Spouts, Pails and Syrup Cans. In our Tin-Plate works we have put into service Record's New Tin-Plate Cleaning and Polishing Machine, which works grandly, doing work that has always been done by hand and producing Tin Plate superior to hand work. All Record's brands of Tin Plate will be run through this machine."

R. E. DIETZ COMPANY, New York and Chicago, manufacturers of commercial, railroad and other Lanterns and Oil Stoves, have issued an illustrated catalogue of their goods in the Spanish language for distribution largely in Mexico, Central and South America and the West Indies, although suitable for any market where that language is spoken. This pamphlet of 111 pages calls attention to a large assortment of tubular Lamps and Lanterns, embracing dash, fire department, side, hand and socket, street, hanging, car, square, triangular and government Lamps. Also marine and bridge signal Lamps, conductors', police, pocket and trade Lanterns. A good line of oil cooking and heating stoves is likewise given. This volume is similar to the one printed in English some time ago, except the language.

WALLACE & SONS, manufacturers of Brass and Copper goods, at Ansonia, Conn., with offices at 29 Chambers street, New York, suspended on Wednesday, and their affairs were placed in the hands of receivers. Thomas Wallace of Ansonia, the treasurer of the concern, and Robert M. Thompson, president of the Oxford Copper Company, have been appointed receivers, both in this State and in Connecticut, on the application of John B. Wallace, the secretary, and U. T. Hungerford, the manager of the New York office. The reason for suspension is given as inability of the company to collect outstanding accounts from customers, on account of the financial stringency, and consequent inability to meet notes falling due in the present month. The liabilities are placed at $875,000, of which $450,000 is on open accounts, nearly all of which are past due, and $425,000 on notes. The nominal assets are put down at $2,000,000, of which unemcumbered property, including rolling mills, wire mills and factory plant at Ansonia, is valued at $1,000,000, book accounts at $600,000 and merchandise at $400,000. It is expected that the suspension will only be temporary, as the assets of the concern largely exceed their liabilities. The business was established at Ansonia in 1848, and incorporated in 1853, with a capital stock of $100,000.

THE FACTORY of the Lalance & Grosjean Mfg. Company, at Woodhaven, L. I., was started up again this week after a briefer shut down than was anticipated. The establishment will be run on half time for the present.

A PRESS REPORT from Chicago, under date of August 24, states that F. W. Lamb & Co., manufacturers of steam heating apparatus, have assigned.

Prize Competitions.

Prize Competition No. 27 (Reopened).

Local Associations of Merchants.

This competition closed July 8, but in view of the exceptionally few replies which have been received from the trade and the importance and practical nature of the subject, we reannounce it as above, and extend the time up to which responses will be accepted to September 16.

The formation of local associations has been found feasible in many places for the purpose of securing more friendly relations among competitors and reaching an understanding in regard to matters of common interest. Among the good results referred to as coming from such associations are the following: Overcoming petty jealousies; cultivating a spirit of fraternity; listing of undesirable customers; an understanding in regard to time of presenting bills; putting in operation early-closing movements; agreement as to the prices at which goods are to be sold; mutual accommodation in supplying goods which one merchant may be temporarily short of, &c. The subject is thus evidently a broad one and of a good deal of practical interest. In discussing it the following points are suggested:

Whether it is desirable to have such associations;

How such associations may be organized;

The objects to be accomplished by them.

It will also be of interest to have any information in regard to the practical working of such associations.

This competition will remain open until September 16, 1893.

Those intending to compete are reminded that it will not be necessary to write long essays, but that comparatively brief and business-like answers will be favorably regarded as meeting the purpose for which these competitions are announced.

The following prizes will be awarded:

First prize	$12.50
Second prize	7.50
Third prize	5.00

The prizes will be awarded for answers which, in the judgment of the Committee of Award, are most suitable for publication and of the most general interest.

The committee to whom the papers in Competition No. 23 were referred have awarded the prizes as follows:

First prize to J. E. JANSSEN.

Second prize to C. O. F. YOUNGSTROM.

Third prize to E. H. MASON.

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Metal and Miscellaneous Prices.

CHICAGO, AUGUST 24, 1893.

Tin—

Straits pigs..... 21½¢

Imported Tin Plates—

Charcoal Plates.—Bright.

Guaranteed Plates command special prices, according to quality.

		Per box.
Galland and Melyn Grade	IC, 10 x 14	@ $6.75
	IC, 12 x 12	@ 6.75
	IC, 14 x 20	@ 6.75
	IC, 20 x 28	@ 13.50
	IX, 10 x 14	@ 8.75
	IX, 12 x 12	@ 8.75
	IX, 14 x 20	@ 8.75
	IX, 20 x 28	@ 17.50
	DC, 12½ x 17	@ 6.50
	DX, 12½ x 17	@ 8.50
Allaway Grade,	IC, 10 x 14	@ 6.50
"	IC, 12 x 12	@ 6.50
"	IC, 14 x 20	@ 6.50
"	IC, 20 x 28	@ 13.00
"	IX, 14 x 20	@ 8.00
"	IX, 20 x 28	@ 16.00

Coke Plates—Bright.

		Per box.
Steel Coke—	IC, 10x14.14x20.	$5.85 @ $6.00
	IC, 14x20.90 ℔	5.60 @ 5.75
	IC, 14x20, 100 ℔	@ 5.85
	10 x 20	8.75 @ 9.00
	20 x 28	11.70 @ 12.00
	X, 10x14, 14 x 20	@ 7.50
B.V. Grade.	IC,10x14, 14x20.	5.85@ 6.00

Charcoal Plates.—Terne.

Guaranteed Plates command special prices, according to quality.

Mansel and Dean Grades.—

IC. 14 x 20 ...@ $5.62½
20 x 28.....@ 11.25
IX. 20 x 28.....@ 14.25

Worcester Brand and equal.—

IC, 14 x 20.. 6.12½@ .....
IC, 20 x 28..12.25 @ .....
IX, 14 x 20.. 7.62½@ .....
20 x 28..15.25 @ .....

American Tin Plates.

Charcoal Plates.—Bright.

Irondale, A. A.—IC, 14 x 20.....$7.00
" " IX, 14 x 20..... 9.00
" " IXX, 14 x 20.....11.00
" " IC, 20 x 28.....14.00
" " IX, 20 x 28.....18.00
" " IXX, 20 x 28.....22 00

Florence.—

IC, 10 x 14, 12 x 12, 14 x 20..$6.75
IX, 10 x 14, 12 x 12, 14 x 20.. 8.50

Palma.—

IC, 10 x 14, 12 x 12, 14 x 20..$7.25
IX, 10 x 14, 12 x 12, 14 x 20.. 9.25

Each extra cross $2.00 and 20 x 28 double these prices.

Brilliant, Tissue Packed, IC, 14 x 20.$9.25
Royal, extra, IC, 14 x 20..... 7.25
Merion, IC, 14 x 20..... 7.00
Almond, IC, 14 x 20..... 6.50
Mint, IC, 14 x 20..... 6.25

Coke Plates.—Bright.

Elwood.—IC, 14 x 20.....$6.00
" IC, 20 x 28.....12.50

Roofing Plates.

Arch, IC, 20 x 28.....@$11.75
Crescent, IC, 20 x 28.....@ 12.25
Crescent, IX, 20 x 28.....@ 15.25
Empire, IC, 20 x 28..... @12 50
Empire, IX, 20 x 28..... @15.50
Hickory, IC, 20 x 28.....@ 12.75
" IX, 20 x 28.....@ 15.75
Alaska (heavily coated), IC, 20x28@$14.50
Alaska IX, 20 x 28.....@17.75
Special, IC, 20 x 28.....@ 15.50
" IX, 20 x 28.....@ 18.50
Merchant's Roofing (extra coated), IC, 20 x 28.....@$17.75
Merchant's Roofing (extra coated), IX, 20 x 28.....@$21.50
Merchant's Old Method, (extra heavily coated), IC, 20 x 28.....@$19.75
Merchant's Old Method (extra heavily coated), IX, 20 x 28.....$23.60

Irondale A:

IC, 14 x 20..... $6.25
IX, 14 x 20..... 7.75
IC, 20 x 28..... 12.50
IX, 20 x 28..... 15.50

Westmoreland:

IC, 14 x 20..... $6.25
IC, 20 x 28..... 12.50

Elwood:

IC, 20 x 28 ..... $12.00

Juno:

IC, 14 x 20..... $5.75
IC, 20 x 28..... 11.50

Illinois, Old Method:

IC, 20 x 28..... $17.00

E. L.:

IC, 20 x 28..... $12.50

Jessie:

IC, 20 x 28..... $12.00

Scott's Extra Coated, Stamped and Resqured, IC, 14 x 20 ..... $9.50
Scott's Extra Coated, Stamped and Resqured, IX, 14 x 20 ..... 11.00
Scott's Extra Coated, Stamped and Resqured, IC, 20 x 28 ..... 19.00
Scott's Extra Coated, Stamped and Resqured, IX, 20 x 28..... 22.00
Neville, Stamped, IC, 14 x 20..... 6.25
" " IX, 14 x 20..... 7.50
" " IC, 20 x 28 ..... 12.50
" " IX, 20 x 28..... 15.00
Taylor's Old Style, IC, 14 x 20 (Stamped and Resqured)..... $9.50
Taylor's Old Style, IC, 20 x 28 (Stamped and Resqured)..... 19.00
Taylor's Roofing, IC, 14 x 20 (Stamped and Resqured)..... 8.25
Taylor's Roofing, IC, 20 x 28 (Stamped and Resqured)..... 16.50
Columbia, IC, 14 x 20 (Stamped)..... 7.25
" IC, 20 x 28 (Stamped)....14.50
Maple, IC, 14 x 20 (Stamped)..... 6.75
" IC, 20 x 28 (Stamped)..... 13.50
Willow, IC, 14 x 20..... 6.50
" IC, 20 x 28..... 13.00
Knoxall, IC, 14 x 20 ..... 6.25
" IC, 20 x 28..... 12.50
Globe, IC, 14 x 20..... 6.00
" IC, 20 x 28 ..... 12.00
Miami, IC, 14 x 20..... 6.00
" IC, 20 x 28..... 12.00
" IX, 20 x 28..... 15.00
" (Redipped), IC, 20 x 28.....17.00

Tin Boiler Plates.

	Per box of 100 sheets.	Per box of 112 sheets.
X, 14 x 28.....	$13.00	$13.00
XX, 14 x 28.....	14.50	14.50
X, 14 x 31.....	14.50	15.80
XX, 14 x 31.....	16.50	17.50

	Per box of 56 sheets.
X, 14 x 56..... 29.50	16.50
XX, 14 x 56..... 32.50	18.20
X, 14 x 60..... 31.50	17.65
XX, 14 x 60..... 35.50	20.90

Sheet Iron—

Black.

	Common American	Refined.
Nos. 10 to 16.....	℔ 2 7-10¢	3 3-10¢
17 to 20.....	℔ 2 8-10¢	3 4-10¢
21 to 24.....	℔ 2 9-10¢	3½¢
25 and 26.....	℔ 3¢	3 6-10¢
27.....	℔ 3 1-10¢	3 7-10¢

Russia, Planished, &c.

Genuine Russia, all numbers....13¢ net.
Patent Planished....℔ A, 10½¢; B, 9½¢
dis. 5%

Galvanized.

Juniata or first quality.....dis. 70&5%

Copper—

Ingot.

Lake..... 11¾¢ @ 12¼¢
Casting Brands..... 11¢ @ 11⅝¢

Sheet and Bolt.

Discount, 25%.

Copper Bottoms.

Discount, 25%.

Seamless Brass and Copper Tubes.

Base price, 17½¢, Chicago, with extras according to size.

Copper, Bronze and Gilding Tube, 3¢ ℔ additional.

Brazed Brass Tubing.
(To No. 20 inclusive.)

Add freight from New York to Chicago to these prices, or 50¢ ℔ 100 ℔.

Above 5-16 inch to 3 inch inclu...35¢
Plain, above 3 inch.....45¢
Plain, 5-16 inch.....45¢
Plain, ¼ inch.....60¢
Plain, 3-16 inch.....$1.00
Plain, ⅛ inch.....$1.50
Fancy Tubing, Brass, to No. 20 incl.....43¢ ℔
Bronze Tubing, 3¢ ℔ ℔ more than Brass.....

35 @ 40 %

Roll and Sheet Brass.

Discount, 35 @ 40%.

Slab Spelter—

Western Spelter 5

Sheet Zinc—

600 ℔ casks..... 6¼¢
300 ℔ casks..... 6½¢
Loose sheets..... 6¾¢

Lead—

Soft Pig Lead..... 4½¢
Bar..... 4.60¢@5¢
Pipe..... 5½¢, dis. 10¢
Block Tin Pipe..... 35¢
Sheet..... 6¢, dis. 10%

Solder—

½&½..... 13¢@13½¢
Extra Wiping..... 11½¢

The prices of the many other qualities of Solder in the market indicated by private brands vary according to composition.

Antimony—

Cookson..... 12 @12½¢
Hallett's..... 11¼¢@11½¢

Wrought-Iron Pipe—

List on following page

1¼ and under, Plain.....57½&10%
1¼ and under, Galv.....52½&10%
1½ and over, Plain.....67½&10%
1½ and over, Galv.....60&10%
Boiler Tubes, list Oct. 24, 1892...65@67½%
Casing, list Nov. 16, 1892.....52½%
Inserted Joints Casing, list Nov. 16, 1892.....47½%
Steel Boiler Tubes.....27½%
Cold Drawn Seamless Steel Tubing...40%

Cast-Iron Soil Pipe—

Cast-Iron Soil-Pipe, Tarred; sizes 2 to 6 inches, inclusive.....dis 70&2½%
Other sizes.....dis 60%

Leader Pipes—

Abendroth's Galv. Spiral Riveted.....60¢
Austin's Corrugated.....60%
Gordon & Gilbert's Corrugated.....60%
Ritchie's (Galv. Iron only) Cor'd.....60%
Ritchie's Spiral Lock Seam, Galv'd.....5t %
Austin's Spiral Ribbed Pipe.....60%
Plain Adjustable Elbows.....60%
James A. Miller Bros. (Galv'd Iron only) Corrugated.....60%

Furnace Fittings—

Discount from Excelsior Steel Furnace Co.'s list.....50%

Steel Roofing—

Perfection.....$3.75 square
Climax.....$3.50 square
The Lloyd Spanish Tiling....$4.50 square

Metallic Shingles—

Cushman's.....$1.25 square
Merchant & Co.'s Spanish Tiles:
Copper, 14 oz.....$36.00 square
Tin.....$9.75@$14.25 square
Steel, painted.....$9.00 square

Drain Pipe—

Discount from list.....50%

Paints, Oils, &c.—

Deodorized Benzine.....7½@8 ¢
Iron Paint, Bright Red.....℔ 2, 2 ¢
" " Brown.....℔ 1½ ¢
" " Purple.....℔ 2½ ¢
" Ground in oil, B. Red ℔ 6½ ¢
" Ground in oil, Red..℔ 6½ ¢
" Ground in oil, Brown ℔ 5½ ¢
" Ground in oil, Purple ℔ 6 ¢
Linseed Oil, Boiled, in bbls.....53¢
Linseed Oil, Raw, in bbls.....50¢
Mineral Paints.....2@4¢
Orange Mineral.....10¾¢
Pure White Lead in Oil.....6¾@7¼¢
Dry White Lead in bbls.....6¼@6¾¢
Red Lead, American.....7@7½¢
Red Venetian, English, dry...$1.65@$1.70
Red Venetian in oil; asst'd cans, 8½¢; kegs.....7½¢
Sipe's Japan Oil, in bbls, ℔ gal.....34¢
Spirits Turpentine, in bbls., ℔ gal..32½¢
Asphaltum, Trinidad Refined, ℔ ton..$45
Tarred Felt, 1 Ply, ℔ 100 ℔.....$1.65
Tarred Felt, 2 Ply, ℔ roll 108 sq. feet.....$1.80
Tarred Felt, 3 Ply, ℔ roll of 108 sq. feet.....$2.00
Roofing Pitch, ℔ bbl. of 300 ℔.....$3.20

NEW YORK, AUGUST 25, 1893.

The following quotations are for small lots.

Aluminum—

No. 2 Grade Metal, in ton lots..℔ ℔, $0.75
No 1 (guaranteed to be 98 % pure and over), in ton lots .....℔ ℔ .90
Lots less than 1 ton, 10¢ ℔ ℔ additional.

Antimony—

Cookson .....℔ ℔, 11¢
Hallett's.....℔ ℔, 10½¢

Brass—

Planished.....net
Roll and Sheet.....35@40%

Brass and Copper Tubes

Brazed Brass Tubing—

List May 20, 1889.

	Per ℔.
Plain, to No. 20 inclusive, above 5-16 inch to 3 inch inclusive....	$0.35
Plain, to No. 20, above 3 inch....	45
Plain, 5-16 inch to No. 20.....	45
Plain, ¼ inch.....	60
Plain, 3-16 inch.....	1.00
Plain, ⅛ inch.....	1.50
Fancy Tubing to No. 20, inclu...	43

35@40%

Copper and Bronze Tubing—

3¢ ℔ ℔ more than brass.

Bronze, Tobin—

Drawn Rods for Bolts, Forgings, &c

Over ¼ to 3½ inches inclusive....17¢ ℔ ℔
Over 3½ to 5 inches inclusive.....18¢ ℔ ℔

Piston Rods, Finished True, Smooth and Straight.

Over ¼ to 3½ inches inclusive....18¢ ℔ ℔
Over 3½ to 5 inches inclusive.....19¢ ℔ ℔

Clips—

Buffalo Damper: Nos. 1, $1.25; 2, $2.50 per doz.....40&10%

Conductors—

Corrugated. *Round or Square—*

Galvanized.....60%
Galvanized, Locked Joints.....60%
Tin.....60%

Spiral Riveted—

Galvanized.....50%

See also *Elbows and Shoes; Eave-Trough Miters; Strainers, Conductor.*

Conductor Strainers—See *Strainers, Conductor.*

Copper—

Bottoms, Pits and Flats....25@25&5%

Ingot.

Lake.....11¢
Ansonia Grade Arizona.....10½¢
Ansonia Grade Casting.....10¢

Planished......net

Sheet and Bolt.....25&25&5%

Tubes—See *Seamless Brass Tubes.*

Coppers, Soldering—

See *Irons, Soldering*, in Current Hardware Prices.

Damper Clips Buffalo—

See Clips, Buffalo Damper.

Eave Troughs—

Lap or Slip Joint, Galvanized.....60&10%
Lap or Slip Joint, Terne.....60%

Eave-Trough Mitres—

Lap or Slip Joint.....list, net

Elbows—

Plain Adjustable—

Tin.....70%
Galvanized.....70%

Crimped Tubing—

Re-Tinned or Galvanized.....35%

Stove-Pipe—

Buffalo Four-Piece.

4½	5	5½	6	7 inch,
$0.78	.87	.90	.99	1.20 per doz..20 %

Elbows and Shoes—

Flat Crimp.

Tin.....35%
Galvanized.....35%

Corrugated.

Flat Crimp.

Galvanized.....60%

Round or Square.

Tin.....60%
Galvanized.....60%

Iron, Sheet—

Black.

	Common American.	R. G. Cleaned American.
Nos. 10 to 16....	℔ ℔, 2½.....	3.10¢
Nos. 17 to 20	℔ ℔, 2.85....	3.10¢
Nos. 21 to 24....	℔ ℔, 2.90.....	3.20¢
Nos. 25 and 26..℔	℔, 3.05.....	3.30¢
No. 27....	℔ ℔, 3.15.....	3.40¢
No. 28.....	℔ ℔, 3¼.....	3½¢
American B. B.....	℔ ℔,	4¢@4½¢

Russia, Planished, &c.

Genuine Russia, according to assortment.....℔ ℔, 11¾@12¾¢
Patent Planished....℔ ℔, A, 10¢; B, 9¢, 5%
Craig Polished Sheet.....℔ ℔, 8½¢

Galvanized.

	B. B.
Nos. 10 to 16.....	70&5%
Nos. 17 to 22.....	
Nos. 23 to 24.....	
Nos. 25 to 26.....	
No. 27.....	
No. 28.....	
Nos. 29 and 30.....	

Filter Joints—

Lee's..... 33⅓ %

Lead—

American Pig..... 4¢
Bar..... 4½¢

New York Prices.

Pipe.....6½¢, 20%
Tin Lined Pipe.....15¢, 20%
Block Tin Pipe.....37½¢, 20%
Sheet.....7¢, 20%
Old Lead in exchange, 3½¢ ℔ ℔.

Metal, Expanded—

Manufacturers' list No. 5.

Lathing.....10%
Fencing, Painted Sheets.....20%
Netting, Painted Sheets.....20%
Door Mats, Galvanized.....25%
Window Guards, Paneled.....15%
Tree Guards, Paneled.....15%

Mitres Eave-Trough—See *Eave-Trough Mitres.*

Paints Oils &c.—

Lead, Amn. White, Dry or in oil:
Kegs, lots less than 500 ℔.... 7 @ 7¼
Kegs, lots 500 ℔ to 5 tons 6¾ @ 6¾
Kegs, lots 5 tons to 12 tons... 6¾ @ 6¾
Kegs, lots 12 tons and over.. 6¼ @ 6½
Lead, White, in oil, 25 ℔ tin pails, add to keg price. ... ... @ ½

ead, White, in oil, 12½ ₰ tin pails, add to keg price..... ... @ 1
Lead, Red, bbls. and ½ bbls... 6 @ 7
Lead, Red, kegs ..... 6¼ @ 7¾
Ocher, American ..... ½ @ 1¾
Red, Venetian, American ..... ₰ 100 ₰..1.00 @ 1.10

Linseed Oil:
City, raw, ₰ gal..... .. @ .50
City, boiled..... .. @ .53
Western, raw..... .. @ .50

Spirits Turpentine:
In regular bbls.....26½ @ .27
In machine bbls..... .. .... 29 @ .29¼

Putty:
In barrels and ½ bbls..... .01⅜ @ .01¾
In tubs ..... .01⅝ @ .01¾
In tin cans .... .01½ @ .02¼
In bladders ..... .01⅞ @ .02¼

Roofing Material, &c.:
Asphaltum, Trinidad Refined, ₰ ton. ....$30.00@$35.00
Asphaltum, Rock, ₰ ton.....$14.00
Coal Tar Felt, 1 Ply, ₰ ₰.....2¢
Coal Tar Felt, 2 Ply, ₰ roll 108 sq. ft. $1.42½
Coal Tar Felt, 3 Ply, ₰ roll 108 sq. ft. $1.8c
Roofing Pitch, ₰ bbl.....$2.2¼

Pipe, Drain 50%

Pipe and Fittings, Cast Iron Soil—

Cast-Iron Soil Pipe, Tarred, sizes 2 to 6 Inches, inclusive.....60@60&10%
Other sizes.....55@55&10%
Cast-Iron Fittings, Tarred, sizes 2 to 6 inches.....60@60&10%
Other sizes.....55@55&10%

Pipe, Spiral—

Galvanized.....60%
Tin.....60%

Rock and Slag Wool—

	₰ ₰	₰ cub. foot.
Slag Wool, ordinary	1¼	1¾¢
Slag Wool, extra.	4¼	3⅜¢
Rock Wool, ordinary	2¼	2¾¢
Rock Wool, extra	7¼	4¾¢

Rosin—

Common and Good—Strained,
Rosin, C. & D.....₰ bbl. $1.02@$1.05
Rosin, E. & F.....₰ bbl. $1.15@$1.20
Rosin, G. & H.....₰ bbl. $1.45@$1.70
Rosin, I. & K.....₰ bbl. $1.90@$2.35
Rosin, M. & N.....₰ bbl $2.50@$3.50

Seamless Brass Tubes..net

Shoes and Elbows—See *Elbows and Shoes.*

Slate Roofing—

According to size, f.o.b. cars, Quarry Station.

Pennsylvania:
Best Bangor, ₰ sqr.....$3.25@$4.50
Pen Argyle, ₰ sqr..... 3.50@ 4.25
Peach Bottom, ₰ sqr..... 5.00@ 6.25
No. 1 Chapman, ₰ sqr..... 4.00@ 4.65
Lehigh Slates, ₰ sqr..... 3.00@ 4.50
Vermont:
Sea Green, ₰ sqr..... 2.70@ 3.20
Purple, ₰ sqr..... 3.50@ 4.50
Unfading Green, ₰ sqr..... 3.50@ 4.00
Red, ₰ sqr..... 9.75@12.00

Solder and Soldering Fluids—

Solder—

½ & ¼ (Guaranteed)..... 13½@14½¢
No. 1..... 11¾@12 ¢
Prices of Solder indicated by private brands vary according to composition.

Soldering Fluids—

Concentrated Soldering Flux.
f.o.b. New York.
In barrels, ₰ ₰..... 4¢
Smaller quantities, ₰ ₰.....5¢

Gedney's Soldering Fluid.
In carboys or barrels, ₰ ₰.....2¢
$1.50 for carboy or barrel; money refunded when returned.

Perfection Soldering Flux.
No charge for package.
8bls., about 500 ₰, ₰ ₰.....3½¢
¼ bbls., about 300 ₰, ₰ ₰.....4¢
Kegs, about 110 ₰, ₰ ₰..... 4¢ } 5% dis.
75¢ extra for keg.
Kegs, about 55 ₰, ₰ ₰..... 4¢

Yager's Soldering Salts.
¼-₰ bottles, each.....30¢
Large quantities, per ₰.....40¢

Spelter—

Western Spelter..... .....4¼¢@4¾¢
Bertha.....

Spiral Pipe—See *Pipe, Spiral.*

Stove-Pipe Elbows—*See Elbows, Stove Pipe.*

Stove Polish—See *Polish, Stove*

Stove Trucks—See *Trucks, Stove.*

Strainers Conductor—

Galvanized.....60%

Tin, Pigs and Bars—

Banca, pigs, ₰ ₰ .....21½¢
Straits, pigs, ₰ ₰.....21¢
Straits in bars, ₰ ₰.....22¢

Tin Plates—

American Terne Plates—

Apollo Roofing.
IC, 14 x 20.....$6.25
IC, 20 x 28.....12.50
IX, 14 x 20..... 7.25
IX, 20 x 28.....14.50

Buckeye.
IC, 14 x 20.....$7.00
IC, 20 x 28.....14.00
IX, 14 x 20..... 8.25
IX, 20 x 28.....16.50
IXX, 14 x 20..... 9.50
IXX, 20 x 28.....19.00

De Mill's.
First New York, IC, 14 x 20.....$5.75
" " " IC, 20 x 28..... 11.50
First New Jersey, IC, 14 x 20..... 5.75
" " " IC, 20 x 28.....11.50
Manhattan, IC, 14 x 20 ..... 7.00
" IC, 20 x 28 ....14.50

Dunlap's.
Double Dipped, IC, 14 x 20.....$8.25
" " IC, 20 x 28.....16.50
" " IX, 14 x 20..... 9.50
" " IX, 20 x 28.....19.00
Domestic, IC, 20 x 28 .....12.00
" IX, 20 x 28.....15.00

Glendale Tin Plate Co.
Optimus, Best Redipped, IC, 14 x 20.$8.25
" " " IC, 20 x 28.16.50
" " " IX, 14 x 20. 9.75
" " " IX, 20 x 28.19.50
N. F., Old Style, IC, 14 x 20..... 7.50
" " " IC, 20 x 28 .... 15.00
" " " IX, 14 x 20 ..... 9.00
" " " IX, 20 x 28..... 18.00
Bonus, Extra Coated, IC, 14 x 20... 6.75
" " " IX, 14 x 20... 8.25
" " " IC, 20 x 28...13.50
" " " IX, 20 x 28...16.50

Gummey, Spering & Co.

	14 x 20	20 x 28
IC Terne, Pennsyl Old Method, Treble Coated	$8.50	$16.75
IC Terne, Leominster, Extra coated	7.75	15.00
IC Terne, Waldo, Redipped	7.25	14.00
IC Terne, Alderly, Extra quality	6.37½	12.50
IC Terne, Phoenix	5.80	11.50
IC " Climax	5.70	11.25
IC " Venux	5.60	11.00
IC " Flag	5.50	10.50

Hamilton's.
Hamilton's Best Redip'd, IC, 14x20 $9.25
" " " IC, 20x28 18.50
" " " IX, 14x20 10.75
" " " IX. 20x28 21.50
Osceola Hand Coated, IC, 14x20 8.25
" " " IC, 20x28 16.50
" " " IX, 14x20 9.75
" " " IX, 20x28 19.50
Lula Best Charcoal, IC, 20x28 12.50
" " " IX, 20x28 16.00

Laufman's.
Apollo, IC (Resquared), 14 x 20.....$8.12
Apollo, IX (Resquared), 14 x 20..... 9.37
Apollo, IC (Resquared), 20 x 28.....16.00
Apollo, IX (Resquared), 20 x 28.....18.50
Apollo, IC (Resquared), 20 x 56.....16.00
Apollo, IX (Resquared), 20 x 56.....18.50
Tip Top, IC (Resquared), 14 x 20.... 6.62
Tip Top, IX (Resquared), 14 x 20.... 7.88
Tip Top, IC (Resquared), 20 x 28....13.00
Tip Top, IX (Resquared), 20 x 28....15.50
Allegheny, IC, 14 x 20..... 6.12
Allegheny, IX, 14 x 20..... 6.38
Allegheny, IC, 20 x 28.....12.00
Allegheny, IX, 20 x 28 .....12.50

McKinley Tin Plate Co.
McKinley:
IC, 20 x 28 .....$12.00
IX, 20 x 28 .....15.00
Fort Pitt.
IC, 20 x 28 .....$11.00
Chicago:
I , 20 x 28 .....11.50
Wilkinsburg Redipped:
IC, 20 x 28.....$16.00
IX, 20 x 28 .....19.00

Merchant's.—All Stamped
Crescent, IC, 20 x 28.....$12.00
Crescent, IC, 14 x 20..... 6.00
Hickory, IC, 20 x 28 (Resquared).. 12.75
Hickory, IC, 14 x 20 (Resquared)...6.37½
Empire, IC, 20 x 28..... 12.25
Empire, IC, 14 x 20.....6.12½
Alaska, IC, 20 x 28 (Resquared).... 14.00
Alaska, IC, 14 x 20 (Resquared).... 7.00
Merchant's Roofing, IC, 20 x 28 (Resquared)..... 17.00
Merchant's Roofing, IC, 14 x 20 (Resquared)..... 8.50
Merchant's Old Method, IC, 20 x 28 Resquared)..... 19.00
Merchant's Old Method, IC, 14 x 20 (Resquared) 9.50

Merry's.
Lion, IC, 14 x 20 (Stamped).....$6.25
IC, 20 x 28. ..... 12.50
Palacio, IC, 14 x 20.....$5.55
IC, 20 x 28..... 11.00

Pittsburgh Tin-Plate Works.
Kensington:
IC, 14 x 20 ..... $6.75
IC, 20 x 28..... 13.50
IX, 14 x 20..... 8.00
IX, 20 x 28 ..... 16.00
Westmoreland:
IC, 14 x 20 ..... $6.25
IC, 20 x 28..... 12.50
Juno:
IC, 14 x 20..... $5.75
IC, 20 x 28 ..... 11.50

Scott's.—All Stamped.
Scott's Extra Coated, IC, 14 x 20 (Resquared) $9.25
Scott's Extra Coated, IX, 14 x 20 (Resquared)..... 10.75
Scott's Extra Coated, IC, 20 x 28 (Resquared)..... 18.50
Scott's Extra Coated, IX, 20 x 28 (Resquared)..... 21.50
Neville, IC, 14 x 20 .... 6.00
" IX, 14 x 20..... 7.25
" IC, 20 x 28..... ....12.00
" IX, 20 x 28 ..... 14.00

N. & G. Taylor Co.'s.
Taylor, Old Style, IC, 14 x 20 (Stamped and Resquared)..... $9.25
Taylor Old Style, IC, 20 x 28 (Stamped and Resquared)..... 18.50
Taylor Roofing, IC, 14 x 20 (Stamped and Resquared)..... 8.00
Taylor Roofing, IC, 20 x 28 (Stamped and Resquared)..... 16.00
Columbia, IC, 14 x 20 (Stamped)... 7.00
Columbia, IC, 20 x 28 (Stamped)... 14.00
Maple, IC, 14 x 20 (Stamped)..... 6.50
Maple, IC, 20 x 28 (Stamped)..... 13.00
Willow, IC, 14 x 20..... 6.25
Willow, IC, 20 x 28..... 12.50
Knoxall, IC, 14 x 20 .. .. 6.00
" IC, 20 x 28..... ..... 12.00
Globe, IC, 14 x 20..... 5.75
Globe, IC, 20 x 28..... 11.50

A. A. Thompson & Co.'s.
Old Colony, IC, 14 x 20.....$8.00
" " IC, 20 x 28.....16.00
Thompson's Puritan, IC, 14 x 20.....5.75
" " IC, 20 x 28....11.50
Durham, IC, 14 x 20.....5.75
" IC, 20 x 28.....11.50
Central, IC, 14 x 20..... 5.45
" IC, 20 x 28.....10.75
" WC, 14 x 20..... 5.25
" WC, 20 x 28.....10.25
Western, IC, 20 x 28.....10.50

U. S. Brands.—All Stamped.
U. S. Monongahela, IC, 14 x 20.....$6.50
U. S. Redipped, IC, 14 x 20..... 9.25
20 x 28 double the price of 14 x 20

American Bright Plates—

Continental Tin Plate Works.
" Phoenix " extra. Climax
IC, 14 x 20, Bright..$6.50 $6.25
IX, " " ...8.00 7.75
All sizes and thicknesses, etc.

Merchant's.
Merchant's Dipped, IC, 14x20.....$11.00
Palma Xtra, IC, 1x20..... 7.25
Florence, IC, 14x20..... 6.75

N. & G. Taylor Co.'s.
Brilliant, Tissue Packed, IC, 14x20..$9.00
Royal, extra, IC, 14x20..... 7.00
Merlon, IC, 14x20..... 6.75
Linden, IC, 14x20..... 6.50
Almond, IC, 14x20..... 6.25
Mint, IC, 14x20..... 6.00

U. S.
IC, 14x20..... $7.25
IC, 20x28..... 14.50

Imported Terne Plates—

Charcoal.
Dean Grade.—IC, 14 x 20.....@$5.50
20 x 28.....@11.00
IX, 14 x 20.....@ 6.75
20 x 28.....@13.50
Abercarne Grade.—IC, 14 x 20.....@ 5.40
20 x 28.....@10.80
IX, 14 x 20...@ 6.62½
20 x 28.....@13.25

Imported Bright Plates—

Charcoal.
Duty: 2.2¢ ₰ ₰.

Melyn and Caland Grade.	IC, 10 x 14	@$6.50
" "	IC, 12 x 12	@ 6.75
" "	IC, 14 x 20	@ 6.50
" "	IC, 20 x 28	@13.00
" "	IX, 10 x 14	@ 8.50
" "	IX, 12 x 12	@ 8.75
" "	IX, 14 x 20	@ 8.50
" "	IX, 20 x 28	@17.00
" "	DC, 12½ x 17	@ 6.00
" "	DX, 12½ x 17	@ 8.00
Allaway Grade.	IC, 10 x 14	@ 6.00
" "	IC, 12 x 12	@ 6.25
" "	IC, 14 x 20	@ 6.00
" "	IC, 20 x 28	@12.00
" "	IX, 10 x 14	@ 7.50
" "	IX, 12 x 12	@ 7.75
" "	IX, 14 x 20	@ 7.50
" "	IX, 20 x 28	@15.00
" "	DC, 12½ x 17	@ 5.50
" "	DX, 12½ x 17	@ 7.00

Coke.
Steel Coke.—IC, 10x14, 14x20.$5.40@$5.50
10x20.....@ 8.50
20x28.11.50@12.00
IX, 10x14, 14x20.....@ 6.75
B. V. Grade.—IC, 10x14, 14x20....@ 5.50

Imported Boiler Plates.—

IXX, 14x26..(112 sheets)..... ..@$13.35
IXX, 14x28..(112 sheets)..... ..@ 14.50
IXX, 14x31..(112 sheets)..... ..@ 16.00

Tinning—

Brass and Copper.....net

Tubing—

Tin.....55%
Galvanized.....55%

Troughs, Eave—See *Eave Troughs*

Trucks Stove—

Improved Lock Frame, per doz....$15.00
Steel Lock Frame, per doz..... 18.00

Brass and Copper.—

Standard List.....30@35%

Zinc—

600 ₰ casks.....6¼¢
Per ₰..... 7¢

News and Notes.

Kansas has still open for settlement nearly 1,000,000 acres of unoccupied Government lands.

A striking instance of a nuisance being converted into a profit is, says the London *Engineer*, afforded by the new process for extracting sulphur from alkali waste. At Widnes alone 500 acres must have been covered with it to an average depth of 12 feet. These 10,000,000 tons of noxious material have been with great difficulty prevented from being a source of intolerable nuisance throughout a large district, owing to the amount of sulphur contained, and the consequent discharge of sulphureted hydrogen into the air.

The Columbian Steamship Company, in connection with the Panama Railway and the North American Navigation Company, have issued a new tariff on west-bound shipments, affecting several hundred kinds of manufactured goods. The new rates are very much lower than have been heretofore in force either by rail or isthmus, and present a reduction of from 40 to 76 per cent. from the latest reduction in rail rates.

The quickness with which our American hustlers can work when caught in the horns of a dilemma was well illustrated at Muncie, Ind., a few days ago, observes a Western exchange. The material for building 1 mile of electric railway arrived in that city, after having been "lost" on the railroad for 12 days, at 4 o'clock Monday morning. The rails and other materials were unloaded and hauled from the cars, over a mile, where the work of road making began. This was kept up until 12 o'clock the next day, when, after just 32 hours' work, 4800 feet of track had been laid, the track lined up, surfaced, dirt thrown back in, the poles erected, the trolley wires strung, the feeders tapped in and a car started over the track. More than 8000 persons were carried to the baseball game over the road that afternoon.

After many experiments the Central-Hudson Railroad Company have found a method of lighting passenger cars perfectly by electricity. At one end of the car which has been equipped is a dynamo about 4 feet high, which is connected with one of the axles of the car. Near the dynamo is a small storage battery. When the car is in motion the dynamo not only supplies electricity to light the 60 incandescent lamps which are suspended along the sides of the car, but also stores a quantity away for use when the car is not in motion. The dynamo and battery are well secured in a closet, upon the door of which are six large padlocks, which renders it impossible for any person to secure a drawing of the mechanism.

Briquettes made of solidified petroleum on the system of Lieutenant Maestracci of the Italian navy have been tried on several tugboats at Marseilles, and were found to give out three times the heat of ordinary coal briquettes, while leaving no residue behind. It is hoped that with a few simple modifications of the furnace the calorific effect will be so far increased that the solidified petroleum will equal four times its weight in coal, and that smoke will be almost entirely suppressed.

LABOR EXCHANGE.

Notices under this heading of reasonable length are inserted free of charge. Only those relating to employment are admitted. Write distinctly on one side of paper only, and do not use postal cards.

HELP WANTED.

A first-class man to work on heavy galvanized iron; state salary. "G.," Box 826, office of *The Metal Worker*, 96-102 Reade street, New York City. Aug. 26

A FOREMAN for skylight and cornice shop; state salary and experience. "G.," Box 826, office of *The Metal Worker*, 96-102 Reade street, New York City. Aug. 26

A TINSMITH, who can also do plumbing and piping; steady job to a steady man. Wm. H. Clarke, Southbridge, Mass. Aug. 26

At once, two or three young men, TINSMITHS and PLUMBERS; to sober, competent and industrious men a steady job will be given; give age and experience and wages expected. Burbank, Studd & Metze, Berlin, N. H. Aug. 26

SALESMEN visiting retail trade in every State in the Union to carry a good paying side line; small samples; you can easily make $1200 to $1500 per year. "Side Line," office of *The Metal Worker*, 59 Dearborn street, Chicago, Ill. Aug. 26

The address of T. P. Kay, plumber; can have a permanent position if he will inform C. H. Carter, Muncie, Ind.; job is O. K. Aug. 26

At once, a TINNER and GENERAL JOBBER, good pay and steady work for the right man; L. Pease & Son, Hartford, Vt. Aug. 26

A first-class man to superintend a tinware factory in the South; he must be well posted in the manufacture of pieced tinware and stamped tinware and know how to handle men and boys; good references required. "Tinware Factory," office of *The Metal Worker*, 96-102 Reade street, New York City. Aug. 26

A good all-around TINSMITH; one with experience in furnace and plumbing work preferred; a steady job to a sober, competent and industrious man; give reference and state age and wages desired. A. J. Snow, Fulton, N. Y. Aug. 19

A reliable, temperate and competent TINSMITH for a steady job in a country town 35 miles from New York; one who is familiar with furnace work, can repair pumps and do the work common in a country tin shop; wages $2 a day. "Tin Shop," office of *The Metal Worker*, 96-102 Reade street, New York City. Aug. 19

A man who thoroughly understands the foundry business in all its branches; must have some capital; manufacturing only staple goods; good profit; splendid opportunity for live man. "Foundry," office of *The Metal Worker*, 96-102 Reade street, New York City. Aug. 19

A TINSMITH; one used to sheet iron work; must be temperate and honest. F. W. Strong, Dalton, Mass. Aug. 19

TINNER who understands all kinds of tin work, roofing of all kinds, sheet iron and furnace work; a steady job for the right man; state wages. A. & F. Rockhold, Hillsboro, Ohio. Aug. 19

SITUATIONS WANTED.

A steady job as TINNER or HARDWARE CLERK; three years' experience in store and shop on roofing, spouting and tinware; best of habits and references. J. H. Bowers, Navarre, Ohio. Aug. 26

A position as CLERK or TRAVELING SALESMAN for a tinware or stove house; three years' experience; can give the best of references. "H.," 408 Lower Main street, Henderson, Ky. Aug. 26

By a first-class TIN, SHEET IRON and FURNACE MAN, a place that will be steady by the year at good wages; am capable of handling men, taking charge of shop and figuring on all kinds of sheet-metal work; 15 years' experience at the business; best of references. Address, with full particulars, "Furnace," office of *The Metal Worker*, 59 Dearborn street, Chicago, Ill. Aug. 25

Young man 21 years of age desires position with reliable hardware firm; have had two years' experience in retail hardware store of good standing; can furnish best of references as to capabilities and character; wages low. W. H. Platt, Girard, Pa. Aug. 26

As FOREMAN, by a japanner; can furnish best of references. "Japanner," office of *The Metal Worker*, 96-102 Reade street, New York City. Aug. 26

By an experienced TINSMITH, 24 years of age, good jobber; has some knowledge of plumbing. "Tinsmith," Washington street, Hoboken, N. J. Aug. 26

By a first-class PLUMBER, 23 years of age, with six years' experience at the trade; city or country; can furnish the best of references. Albert Johnson, 349 East Fifty-eighth street, New York City. Aug. 26

Steady situation wanted within a month, as TINSMITH and GENERAL JOBBER, or as a clerk in a stove and tin shop; 15 years' experience. C. E. Whelden, Springfield, Vt. Aug. 26

TINSMITH, inside and outside worker, desires a steady job; city or country. "Tinsmith," care of Mr. Labouseur, 322 Washington street, Hoboken, N. J. Aug. 26

By a first-class all round workman at plumbing and general jobbing; can do all kinds of iron piping; steady job desired; can furnish best of references. "Workman, Box 35," office of *The Metal Worker*, 96-102 Reade street, New York City. Aug. 26

By a TINSMITH and GENERAL JOBBER, in the city or country. "Tinsmith," 1575 Avenue A, New York City. Aug. 26

By a first-class TINSMITH and SHEET-METAL WORKER; 15 years' experience; well acquainted with the hardware business, and the best of references. F. A. Thompson, Denver, Col. Aug. 26

By a first-class workman, over ten years' experience; thoroughly familiar with sheet-metal roofing and ceiling work, also understands the care and handling of iron roofing machinery, and competent to take charge of men. M. C. James, office of *The Metal Worker*, 22-24 Pickering Building, Cincinnati, Ohio. Aug. 26

Good PLUMBER and GAS FITTER; can take charge of buildings and country work; sober and reliable. B. J. Curry, 362 West Forty-third street, New York City. Aug. 26

An experienced PLATER wants work; understands silver, nickel, brass, copper, oxidizing, lacquers, also polishing, buffing, water rolling; best references. T. McDermott, 2069 E. Madison avenue, Cleveland, Ohio. Aug. 26

A young German TINSMITH, 24 years old, two years in this country, who understands the business in all its branches, wants a steady position. Louis Kenzman, 199 Forsyth street, New York City. Aug. 26

Furnace and stove SALESMAN who is acquainted with the stove and tin trade in New England, and a practical TINSMITH and FURNACE MAN, strictly temperate and can furnish first-class references, would like a situation. "Salesman," office of *The Metal Worker*, 146 Franklin street, Boston, Mass. Aug. 26

Steady job for year or more by a good all-round TINNER; 13 years' experience; furnace work, job work, roofing, assortment, stoves, &c.; first-class references; Chicago preferred; state wages. J. D. Green, Urbana, Ill. Aug. 26

PLUMBER; on country or city work; has 20 years' experience; can work from plans or specifications on new or old work, small or large jobs; first-class references. "Sanitary," Box 826, office of *The Metal Worker*, 96-102 Reade street, New York City. Aug. 26

By October 1, a situation as TINNER by an all-round, good every-day workman; am acquainted with the general run of a hardware establishment; can do roofing, furnace work, assortment and general job work; want steady work and not less than 25 cents per hour; total abstainer; last situation three years. S. Wiltshire, Sun Prairie, Wis. Aug 26.

As TINNER or SALESMAN in hardware store anywhere west of the Mississippi by a young, single man; honest, industrious and capable; best of references given. S. W. Moore, New City, Kan. Aug. 26

By a TINSMITH, 22 years of age, 7 years' experience, some knowledge of plumbing, speaks English and German, steady job desired, city or country. "O. E. F.," 216 E. Fourth street, New York City. Aug. 19

A position as SALESMAN by a man of 15 years' experience on the road selling hardware, thoroughly acquainted with shelf and heavy hardware, iron and tinners' stock. "Head," office of *The Metal Worker*, Fifth and Main streets, Cincinnati, Ohio. Aug. 19

A practical STEAM and HOT-WATER FITTER and SALESMAN desires to represent a manufacturer of some special goods in the heating or plumbing line for the States of Pennsylvania and New Jersey. "R. S.," Lock Box 1086, Philadelphia. Aug. 19

By a practical PLUMBER and STEAM and HOT-WATER FITTER; competent to draw plans and specifications, and do all work desired; situation preferred in a city from 10,000 to 15,000 inhabitants. Wilson, Box 619, Schenectady, N. Y. Aug. 19

By a practical WOOD PATTERN MAKER, who is thoroughly conversant with furnace work, inside the shop and on the road, as estimator, having been employed in that capacity for 16 years. F. Kildridge, 405 East Eighty-eighth street, New York. Aug. 19

A man 45 years old, 12 years' experience in retail hardware and furniture store; can make myself useful at anything connected with hardware, stove, furniture or tin shop; can take charge of store and would like a position as clerk, or take charge of branch store; I am temperate; Western town preferred; I have a good position now, but I want a change of location; I am a married man; can give the best of references. Z. C. Strong, Oakland, Iowa. Aug. 19

An all-round TINSMITH and SHEET-IRON WORKER; good on furnace, fire place, heaters, roofing, iron pipe, pumps, and all general jobbing, wants steady job by the year in country or city. A. A. Clark, office of *The Metal Worker*, 96-102 Reade street, New York City. Aug. 19

By a PLUMBER and GAS FITTER in the West or South; married; temperate; willing to work; wages moderate. Henry W. Bauer, 469 West Congress street, Chicago, Ill. Aug. 19

Steady situation by a PLUMBER; good workman, sober and industrious, understands gasfitting, hot-water heating and both city and country work; 14 years' experience. "Plumber," 19 Centre street, Yonkers, N. Y. Aug. 19

By a practical and experienced STOVE MOUNTER on bench, floor, drill or patterns; competent in handling men; can furnish good reference. "G. C.," Box 819, office of *The Metal Worker*, 96-102 Reade street, New York. Aug. 19

A first-class furnace and range workman, also used to all kinds of jobbing in city or country shop; tin roofing, pumps, &c., wants steady position now or by September 1; temperate; references. Geo. Anderson, Flushing, L. I. Aug. 19

A man with 18 years' experience in PLUMBING, STEAM and HOT-WATER HEATING trades, and can take charge of any kind of machinery; reference given. "U. S. G. F.," Middletown, Dauphin County, Pa. Aug. 19

By a strictly temperate PLUMBER, one who understands all kinds of job tin work; used to estimating and handling men; would like permanent position; 15 years' experience. Box 466, Wellsville, N. Y. Aug. 19

ESTABLISHED 1864.

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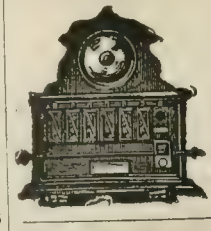

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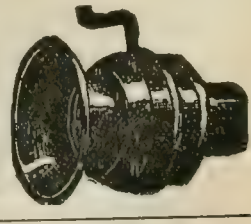

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WRITE FOR PRICES TO

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MINERS,

27 PECK SLIP, NEW YORK.

Chicago Branch, 67 & 69 Lake St.

THE METAL WORKER.

NEW YORK AND CHICAGO.

Saturday, September 2, 1893.

DAVID WILLIAMS, - PUBLISHER

BUSINESS OFFICES:

NEW YORK.....96-102 Reade Street.
PHILADELPHIA.....220 South Fourth Street.
BOSTON.....146 Franklin Street.
PITTSBURGH..... Room 509 Hamilton Building.
CHICAGO.....59 Dearborn Street, cor. Randolph.
CINCINNATI.....Rooms 22-24 Pickering Building.
ST. LOUIS.....Bank of Commerce Building.
CLEVELAND.....312 The Cuyahoga.

BRITISH AGENCY: The Ironmonger, 42 Cannon street, London, England.

American Tin-Plate Statistics.

There has been no little comment upon the action of the Secretary of the Treasury in withholding the statistics collected by Special Agent Ira Ayer of the production of American tin plates. The quarterly report, including the statistics up to April 1, was promptly sent in to the Treasury Department, where it has lain concealed for months. Rumor is to the effect that the present Secretary has directed that the figures be reclassified so that they will show the quantities of tin plate made from American black iron and from the imported sheets, and it is intimated that, possibly, there may be a new ruling of the Department affecting the definition of American tin plate. It will be remembered that under the former administration it was announced that the plates tinned in this country, without respect to the place of their original manufacture, should be classed as an American product and should be entered as such in the statistics that are being kept. The importance attaching to the quantity of the American product is, of course, well known, for upon the output of the American works previous to 1897 will depend the continuance of the present law, that is, provided Congress does not in the mean time repeal the tariff act of 1890. According to the wording of the act, the statistics must show that during either of the six years preceding 1897 the domestic product of tin plates has equaled one-third the amount of such plates imported during any year of the same period if the tariff is to be retained. It is evident, therefore, that those who are interested in the continuance of the present duty of $2\frac{3}{10}$ cents per pound are anxious to make the domestic product appear as large as possible, and this will be very greatly increased or diminished as the tin plates made from foreign black sheets are included in or excluded from the total figures.

The Treasury Ruling.

According to the present interpretation of the law, as above noticed, foreign black plates tinned here will count as American tin plates, but there is a new Secretary of the Treasury since this interpretation was promulgated, and it lies with him to acceptor to change the ruling of his predecessor. While the Secretary occupies, in a certain sense, a judicial position, a ruling is simply his opinion as to the meaning of the statute. It, therefore, is evident that he himself, or his successor in office, can reverse his opinion. The decision in the present case is a difficult one and reports have come from Washington that inquiries are being made by the Treasury Department in many places to find precedents for a tin-plate ruling. Plates made in England and tinned in Wales are classed as Welsh plates, but it is difficult to find many cases sufficiently alike to form precedents, and even though the Secretary is persuaded that foreign black plates should not be turned into American tin plates, it does not follow that he will reverse the present interpretation of the act. It is, however, strange that while the decision is pending the figures collected by the special agent of the Treasury have not been made public, as it is a matter in which there is a great interest. A classification of the production as American made and as black plates tinned in this country would not commit the Department to any view of the matter, while it would furnish the information which the public are anxious to secure.

Classifying Information.

The systematic classification of information relating to one's chosen trade or profession, and its ready application as a result of this classification, cannot fail to improve a man both intellectually and financially. In these days of book and newspaper there is scarcely a progressive man who does not take a trade paper and own a few technical books. In the periodical reading of his paper he notes many things of value, but not being interested in them at the moment they are not impressed upon his memory. When at some future time their information would be of marked value to him he has either forgotten it altogether or at least cannot remember where he saw it. It is his ability to find at short notice information regarding any given subject that makes him valuable, rather than his mere encyclopedic knowledge. His mind is not burdened with a load and yet he is practically as well equipped as though his head carried it all.

Scrap Books.

The scrap book always suggests itself as the most ready and simple means of retaining newspaper clippings. But it usually fails just as it becomes of greatest service, for as soon as the material has accumulated in sufficient quantity to make reference to it desirable, it will take too much time to find it unless the entire book is satisfactorily indexed. To avoid the necessity of thus indexing, it has been found very satisfactory to substitute a series of large, stout envelopes for the scrap book. These envelopes may be variously titled according to their contents, which may consist either of newspaper clippings, illustrations, sketches or memoranda. A proper alphabetical arrangement of these envelopes makes it an exceedingly simple matter to instantly find all the material of this character relating to any given subject. The arrangement is expansible without limit, and the envelopes may be classified and sub-titled with the greatest refinement.

Card Index.

For the classification of such material as cannot be filed in this manner, or even for the purpose of making the scrap book practical, the card index stands as above all other methods the best. This can be adopted of the form of the general library index, with cards about 3 inches by 5 inches. A card relating to any given subject may be filled in at any time and place and subsequently dropped into its proper position. Like the envelope system, there is no limit to the extent of this arrangement, and anything conceivable may be entered upon the cards. Before starting the project, however, the entire subject of card indexing should be studied, for it is an art in itself. The general style in which the card is to be filled out should be decided upon and adhered to. All cards should be titled under the broadest word in the title—that is, the one which the other words simply modify. This first word then becomes indicative of a class, while the modifying words indicate the subdivisions of this class. As the index increases cross reference cards, division cards, and the like can be introduced—in fact, any device or arrangement that will facilitate the use of the index.

Refuse Disposal and Utilization

A report of the borough engineer of the city of Southampton, England, published in the *American Architect*, gives some very interesting details in regard to the disposal of the city's refuse and sewage. The Southampton destructor is said to be the best in England, and is capable of disposing of 50 to 60 tons of garbage per day. The sewage is clarified by precipitation, and the resulting sludge is passed into the destructor. The residue from the

continuous day and night combustion consists of about 20 per cent. of good, hard clinkers and sharp, fine ashes. The clinkers are used for the foundation of roadways and the manufacture of paving slabs. The latter are said to have been used in paving several footpaths of the town and some large public baths, at a cost of about 60 cents per square yard. The fine ashes are also employed for making mortar, with which many public buildings have been erected, and for many other purposes. The mortar is also sold to builders at $1.80 per cubic yard. The waste heat from the destructor is used for producing electricity, giving the light for two arc lamps, in the works, of 3000 candle-power each, and 12 incandescent lamps of 16 candle-power, besides supplying the lights of four streets in the vicinity of the works, the Town Hall and other municipal buildings. The total annual expenditure for the maintenance of the destructor and the sewage works is about $2790, while the receipts from the sale of manure, clinkers, concrete, slabs, ashes, &c., reaches some $4380, so that the apparatus is a good investment on the original outlay of $32,715. It would seem that the provision of similar methods of disposing of city and house refuse might be readily made more general. That it tends to ameliorate the public health has been proved in many cities where destructors or cremators are already in operation.

The Repeal of the Sherman Act.

The unexpectedly large majority secured in the House of Representatives for the repeal of the Silver Purchasing law must be regarded as a distinct triumph for the solid business interests of the country. Its greatest good is likely to come from the effect which it will produce upon the trimmers and talkers in the Senate. Even as it is, the business world has had its patience taxed to the limit of endurance. When commerce and industry are in the condition in which they have been for months, immediate relief is demanded. What is wanted is action, and not rhetoric, and the sooner the Senate follows the House in passing a repeal bill the better, because it is the course of that body which has been in doubt. Even now the improved chances of favorable action are being discounted. Still, absolute certainty is required to restore confidence, particularly abroad, from whence the contagion of doubt first spread.

Efficient Foremen.

The test of efficiency in a foreman is how much good work he can properly and legitimately get out of the men placed in his charge. It is to be noted that in this proposition is embraced the ideas of quantity, quality and means used for obtaining these ends in work performed for wages. Either quantity or quality may fall short, and the foreman's skill is not up to the standard unless a full measure of both is obtained. If these cannot be secured except by resort to such methods as are certain to breed disaffection, discontent and disloyalty to the interests of employers in the ranks of the employed, the foreman is unqualified for his position, and is a damage to the establishment in whose service he is engaged.

Qualifications for a Good Foreman.

It is difficult if not impossible to specify all the qualifications needed by a competent foreman. Of course he must know what is good and bad in the quality of the work the performance of which he is placed to superintend, and he must himself know not only how to execute and how to teach others to do this work, but also the quantity of the work that he can justly demand from each workman under his charge. But beyond these essential qualifications, which will be, perhaps, possessed by nine-tenths of the men he supervises, he must possess something more, found only in comparatively few artisans. Tact, adroitness in management of men, power to command willing and ready obedience, ability to maintain discipline in a shop without exasperating men, and without arousing antagonism to his authority. These are a few of the general ways of expressing what is needed in a foreman beyond mere skill in the craft to which he belongs. But, after all, these expressions mean something quite impossible to define minutely. Summed up, they mean that besides being an expert in the art to which he attaches himself, he must have other qualities that cannot be specified in detail, and that whether he has them or not can only be determined by results attained when he first steps out of the ranks into a position of command.

FLASHINGS.

J. M. Robinson & Co., Cincinnati, Ohio, issue a number of illustrated circulars relating to the machinery of their manufacture. The pamphlets, all of a size, measure 8½ x 6 inches, and contain full accounts of the tools referred to. One of them is devoted to cornice brakes, showing general views of the brakes made by the company, describing them thoroughly and giving diagrams of the moldings and shapes that can be executed by their tools. A second pamphlet shows their improved 8-foot heavy bending power brake, likewise stove and range makers' brakes, folding machines, &c. A third pamphlet shows the V-crimping and corrugating machines, curving rolls and other tools, all of which are completely illustrated and described. A fourth pamphlet which has recently been issued by the firm relates to a variety of hand, foot and power punching presses, showing screw presses, gate cutters, pendulum foot presses, power presses, drop presses and power lifts. The power punching presses are shown in a large variety of styles, all the machines being illustrated and described, with tables of dimensions, prices, &c.

British Board of Trade returns for the first half of this year show a remarkable increase in the exports of galvanized and corrugated iron to Central America, South Africa, the East Indies and Australia. The use of this material is said to be largely increasing in warm climates.

W. J. Wilder, Hampton, Iowa, issues a circular addressed to manufacturers of sheet metal respecting the advantages of aluminum-alloy coated sheets. In the circular referred to he mentions the objections to galvanized iron and the difficulty experienced in making bends, due to the flaking off of the metal. In his opinion the cause of this is "the grain of the spelter is too coarse to enter the fine pores of the steel." Sheets, however, coated with aluminum-alloy, he claims, overcome this difficulty. The alloy is a combination of aluminum and other metals, containing no poisons. At the bottom of the circular is a reference to a test of aluminum-alloy coated sheets, subjected to water and slush for six months without any sign of rust. Sheets of this sort may be soldered with ordinary solder and acid flux.

SCRAP.

R. Wallace & Sons Mfg. Company, Wallingford, Conn., are using about 1000 tons a year of American black plates, which they manufacture into tin spoons and other articles. The firm report themselves as greatly pleased with the quality of the domestic material.

At Apollo, Pa., P. H. Laufman & Co. are running their sheet mills and tinplate works to full capacity. Operations are temporarily suspended in the mills of the Apollo Iron & Steel Company. The steel works are in operation.

At Canonsburg, Pa., the works of the Canonsburg Iron & Steel Company are in operation, with the exception of No. 1 tin mill. The old black plate mill has been running steadily for the past six weeks and the puddlers have worked part time. The two sheet mills were started up last week.

The St Louis Stamping Company, St. Louis, Mo., have resumed operations in all branches of their works after an idleness of nearly two months. The proprietors have, it is reported, signed the Amalgamated scale, and 2000 men were set to work on Thursday, to the great relief of the large number of people who depend directly or indirectly upon these works.

Wallace, Banfield & Co, Limited, of Irondale, Ohio, announce that they have appointed Casey & Day, 445 The Rookery, Chicago, as sole agents for their Irondale Tin and Terne Plates.

Prize Competitions.

Prize Competition No. 27 (Reopened).

Local Associations of Merchants.

This competition closed July 8, but in view of the exceptionally few replies which have been received from the trade and the importance and practical nature of the subject, we have reopened it, and extend the time up to which responses will be accepted to September 16.

Some points in regard to the subject appeared in the announcement concerning the competition in our last issue, and will probably be of service to those who are intending to compete.

The committee to whom the papers in Competition No. 24 were referred have awarded the prizes as follows:

First prize to C. T. Rosenthal.
Second prize to Ross F. Rainey.
Third prize to J. E. Janssen.

THE LETTER BOX.

Cleaning Galvanized Iron.

From L. G. L. & Co., *New York.*—Can *The Metal Worker* tell us what to use to clean an article made from galvanized sheet iron after it is finished?

Note. — Articles made from galvanized sheet iron that have tarnished in the making or while in stock may be cleaned so as to present a bright appearance by washing or scrubbing with a solution consisting of ½ pint of muriatic (hydrochloric) acid and 1½ pints of water. They should be thoroughly rinsed after the washing, to remove all of the cleaning fluid, and carefully dried. A thin, transparent varnish or lacquer on the goods after they are cleaned will preserve their bright, clean appearance for a long time by protecting the galvanizing from the action of the air.

Cold Air from Hall.

From J. J. WILSON, *Troy, N. Y.*—Having had my attention called to communication from "Western" in *The Metal Worker* of July 8, entitled "Cold Air from Hall," I desire to make a few remarks in regard to same. The general tenor of this essay would lead one to suppose that the setting of furnaces so as to obtain satisfactory results was a game of chance, and a majority of the essential details largely supposition. "Western" says if the house is properly situated, the north or west side of the building is selected and the cold-air box made equal to three-fourths the total area of all the hot-air pipes. Under such favorable circumstances the furnace is supposed to operate in a proper manner and furnish the desired amount of hot air to each register. Does it do so? Then follow remarks in regard to cold air coming up through warm-air registers during the prevalence of high winds. In answer to the above, I can say the furnace will work if properly located, the warm-air pipes and cold-air duct of necessary size, and the cold-air connections made as they should be. If "Western" will examine the pages of "*The Metal Worker* Essays on House Heating" he will find this subject thoroughly discussed, and also drawings which will show him how cold-air should be connected to overcome this difficulty. In regard to the closing of damper in cold-air box, what would a dealer think of a customer who would object to using the oven damper in a range or cook stove, when they wished to heat oven for baking, and insist upon this being done without any attention to details? The comparison is not overdrawn. One would have just as much reason to expect to close off the warm air from an overheated room by simply wishing so, instead of closing the register or the damper in the warm-air pipe, as to expect a furnace to operate in a satisfactory manner without attending to the different appliances and dampers. Regarding warm air coming out of cold-air box, there is an old adage which teaches us that there is always a cause for an effect. Having had the pleasure of calling commercially upon a majority of the heating trade from the Atlantic to the Pacific, I have at different times had my attention called to this condition of affairs, and have had some curious experience in regard to this matter, but I have never met with a case of this kind but that it was due to an oversight in giving proper attention to details. As regards taking air from the cellar for the furnace, this is done quite often in that class of work which is cheap to buy, but dear to own. Hardly any rational person if given his choice, aside from the expense, would choose this mode of procuring air. Few would care to use the cellar as a living room, and yet this is the effect accomplished by using cellar air. No man would intentionally devise means to injure the health of his family, yet will any one affirm that a house heated in this way is as healthy from a sanitary point as the house which has been provided with adjuncts for a bountiful supply of outside air? I know of some localities where the entire supply of air to the furnace is taken from the hall or other room. The ultimate object attained by this means generally is the using of a furnace with small fire pot in proportion to size of casing used, or one that is short in square feet of heating surface. There are, however, many points in the extreme East and West where a moderate sized exhaust pipe taken from the hall to be used in conjunction with cold air from outside is beneficial—viz.: During extreme cold weather before retiring at night it is customary to fill the furnace fire pot with coal and set the different appliances to check rapid consumption of fuel. The fire surfaces of the furnace being by this process cooled, will not heat air to the temperature that it would if drafts were open; therefore, instead of using outside air at a temperature near zero, air is taken from the hall at a temperature of about 50°. The lower rooms adjacent to the hall are not occupied during the night, hence the air is not much contaminated and the temperature of air in the entire house much higher than if outside air had been used. This, then, is the proper use of exhaust from the hall or room—viz.: to be used only as an adjunct.

Account of a Well Cooler.

From C. A. S., *Springfield, Ohio.*—As a practical illustration of the benefit of your Letter Box in *The Metal Worker*, I give you a bit of my experience. When I built my house I drilled a well 40 feet deep in the rock under the kitchen, but a few years afterward a large dormitory building was erected on the next lot, and they put in a sink hole and contaminated the water in my well so that I had to abandon it. Some time ago I noticed the discussion about a well cooler not working properly, and the idea struck me why not run my pipe for city water down in the well and up again and get cool water, instead of using the water warm, as it usually is in the mains. Acting on this inspiration, I pulled up the old pump that had been standing for several years unused in the well, and taking off the pump and suction chamber, put a U on the bottom, connecting a ½-inch pipe to it, and running to the water faucet. I then connected the city water to the top of the pump pipe and dropped the whole thing in the well. We are now using most delightful spring water, cool and clear as though it came out of the old oaken bucket. I have gotten several such things out of *The Metal Worker* simply by putting in practical operation such ideas as I have gathered or which came to me in a leisure moment from reading the paper. I have been a subscriber to *The Metal Worker* since 1874, and value it as the best among all the publications that I take—and I take several.

Squared Roofing Tin.

From W. H. B., *Monroe, N. Y.*—Notwithstanding the claims made by the advocates of steel and terne plate standing-seam roofs, there is still a large amount of flat-seam tin roofing laid. The ordinary terne plates are often irregular in shape, with curved ends and sides not being squared before placing in the box. The sides and ends of such sheets must be cut and the corners clipped before the edges can be turned. These operations should be performed by the manufacturers. Why do not some of the manufacturers of American roofing plates offer the trade sheets with the edges squared and turned ready to lay on the roof? When the sheets have the edges turned they pack together nicely, and four packs of 28 sheets each would constitute a box of 112 sheets as now, and this work could be done cheaper in a large way by the manufacturers than at the shop or job by the roofers. We do not make our own clothes, harness, or for that matter our tinware, as of old, and why not have our roofing plates delivered to us ready to lay? It must be a simple operation to cut the corners off of a box of plates by means of the powerful machinery now at hand, and there is, I believe, an edger made that turns the four edges on roofing plates at once, but the price removes it from the reach of most roofers. By the use of improved machinery it appears possible to offer the trade roofing plates squared, clipped and edged ready for laying on flat-seam work. Such an improvement should command the attention and patronage of the trade as soon as introduced.

Answer.—If our correspondent simply required terne plates that were squared he could be accommodated, as there are manufacturers who make a practice of squaring certain brands of plates. There are other brands or grades that are not squared. As stated by a prominent dealer, there is so much competition in price that makers do not care to add the cost of squaring, especially as the plates may be required for various uses for which squared plates are not demanded. Regarding the turning of edges on plates, the objection raised by a number of roofers was that if such a course was to be followed the various makers would not all produce sheets or edges of the same size. Then, as the packages would be more bulky, the boxes would be more

expensive and freight charges increased. Also that the notching and turning of edges on plates was something that could be done by the men at odd times, or during stormy weather. Other roofers were of the opinion that turned roofing plates would be an improvement, providing the price charged for the work was not too high.

Wants the Plumbers' Opinions.

From S. W. H., *Maine.*—In answer to "M. C. H.," whose question appears under the above heading in *The Metal Worker*, August 19, I suppose a number of opinions exist as to whether an iron or lead trap is best for the purpose mentioned. I think lead traps are best, because there is no danger of breaking with the settling of the soil pipe and no sand holes are found in them. Iron traps frequently have sand holes, and are not true and have to be blocked up to make them set level, while a plumber can readily fit a lead trap to the requirements. With my experience I should vote for the lead trap every time.

A Chimney Problem.

From OLD RELIABLE, *North, Mo.*—In answer to "X. Y. & Z.'s" chimney problem in *The Metal Worker*, August 12, I find by the explanation and sketch that the fault is entirely in the two stoves. It is well known that the Todd stoves, especially when new, are practically air tight, and the older the stoves get the less trouble they will cause. Now for the remedy: Punch a 1¼-inch hole in the lower part of the first joint of pipe and make a sheet-iron slide damper to cover it. Then every time the present damper is opened open the slide damper in the pipe.

Lining for Tank.

From APPRENTICE, *Bainbridge, N. Y.*—Please inform a subscriber how the operation of lead burning is performed when a tank is to be lined with sheet lead. Is lead better than copper for the purpose? Some are of the opinion that lead is injurious to water. How should the lead be fastened to the sides of a tank?

Answer.—We refer our correspondent to the following articles that have been published in *The Metal Worker* this year: "Lining Tank with Copper," March 11. "Lining a Tank," April 22. "Lead Burning," June 3. Either lead or copper, if of sufficient thickness, is well adapted for lining a tank, providing the water is not to be used for culinary purposes, although both of the metals are acted upon to a certain extent by some kinds of water. Pure waters act upon lead and copper with more energy than those that contain carbonates, as most waters do. When lead or copper is exposed to the action of air and water alternately, it is liable to corrosion, and on this account water in metal-lined tanks should be maintained at as nearly one level as possible. Lead is not suitable for lining tanks to contain hot water, as the steam condenses on the lead. The combined action of air and water corrodes the lead, and as the water drips back into the tank it is liable to carry the corroded lead with it. If the water from the tank is to be used for culinary purposes tinned copper would be the proper material to use, as tin is not acted on by water.

The sheet lead is secured to the sides and ends of a wooden tank by making countersinks or dots in the wood about 2 feet apart. These dots to be about 2 or 2½ inches in diameter, and ½ inch deep. After the lead is in position it can be sunk into the dots with the back of the wiping ladle. Then scrape the dots and apply plumbers' soil about the edges. An iron or steel screw is then to be put in the center of each dot, allowing the head of the screw to project a little, but not beyond the inner surface of the tank. The dots are then ready for wiping, which is to be done in the usual manner.

Plumbing Regulations.

From L. E. N., *Westfield, Mass.*—Can you tell us how we can learn the regulations that govern plumbing in different cities?

Answer.—In *The Metal Worker*, April 29, the regulations of Washington, D. C., were given, and those of Mt. Vernon, N. Y., May 27; Massachusetts State law, July 29, and of Yonkers, N. Y., August 5. By writing to the Board of Health of a city a copy of the regulations in use could probably be secured.

Information About Rubber.

From J. F. S., *Seneca, Kan.*—I would like to ask the "boys" who contribute to the Letter Box if any of them can tell me how the rubber of old wringer rolls can be dissolved, so that it can be molded and returned to the same state as it was before being dissolved.

Gas Heating Stoves.

From H. W. F., *St. Louis, Mo.*—I have an idea to heat my rooms, such as dining, sitting and bed rooms, with gas stoves, or gas radiators, this winter, coal gas being used, as there is no natural gas here. Please state in *The Metal Worker* if they are practical and healthy to use for that purpose. I would also like to hear from some of the readers of *The Metal Worker*.

Answer—If a gas stove is set like an ordinary coal stove, there is no question whatever as to its healthfulness. Small gas stoves are sometimes set in rooms without any flue connection and in that case they do not do any appreciable harm on account of the room being ventilated by opening doors and the gas given off being not more than what is evolved by a gas jet or lamp flame. Gas stoves, however, of sufficient capacity to warm a house should be connected with a chimney, the same as a coal or wood stove. Not only will such connection keep the atmosphere of the rooms purer, but it will prevent the frosting and wetting of the windows so common where gas is burned in an unventilated room.

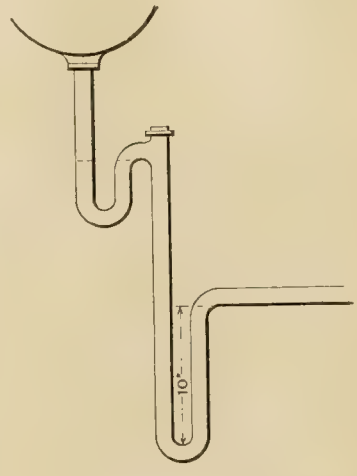
Book on Explosives.

From M. D. S., *New York.*—Please inform me through *The Metal Worker* what is the most complete work touching the latest improvements in explosives for mining work.

Answer.—A well-known work on this subject is "Eissler's Explosives, Nitro-Glycerine and Dynamite." The price of the book is $4 and it can be obtained through the Book Department of this office.

Air-Bound Pipes.

From G. F., *Washington, D. C.*—Please inform me through *The Metal Worker* what pressure is required to overcome a certain obstruction in a closed water pipe. For instance, what hight of column is necessary to overcome an air-bound trap 10 inches deep and 1 inch in diameter, or if there are two traps on a level with air between them, what head would it take to overcome them? In the sketches



Air-Bound Pipes.—Fig. 1.—Traps on Different Levels.

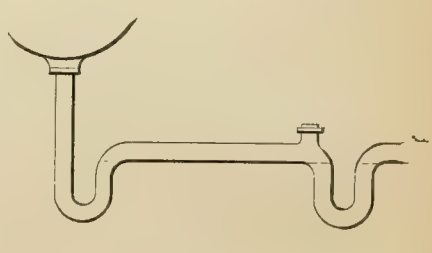


Fig. 2.—Traps on One Level.

Fig. 1 shows one trap above the other, and Fig. 2 shows the trap on a level; the air is between them in both cases, and there is a plug for filling the further trap.

A Questionable Chimney.

From CÆSAR, *Louisville, Ky.*—I would like to get through the Letter Box ideas from practical men on the following case: Having contracted to place a hard coal furnace where its capacity of 50,000 cubic feet will be required, I find that the chimney is only 3 x 12, and does not extend to the cellar. Would a first-class furnaceman connect such a furnace with this flue, and if so how would he connect it without tearing it out from top to bottom? This is the nut I wish cracked.

Note.—Here is an opportunity to give some information on chimneys, the need of which is felt by all, and the question can be discussed with advantage.

The Curtis Steam Trap.

The accompanying illustrations show a new form of valve which is now used with the steam trap made by d'Este & Seeley Co. (formerly Curtis Regulator Co.), 29 Haverhill St., Boston, Mass. As will be seen from Fig. 1 the trap, of close grained cast iron, is made very heavy, in the form of a cylindrical pot with rounded ends, a form which experience has shown to be the best shape to resist pressure, being sufficiently strong to withstand a pressure of 250 pounds. A neck or nozzle large enough to admit the float is placed on one side. This nozzle is covered by a strong plate, to which is bolted the composition valve. Should it be necessary for any reason to take out the float and valve it may be done by removing the plate, which brings away with it the float and valve, so that it may be readily examined, repaired or shipped to the manufacturers, should this be necessary, but at the same time it leaves the pot in place and connected.

Looking at the sectional view, Fig. 2, it will be seen that the valve body is provided with strong ears, by means of which it may be bolted to the cover of the trap. The valve itself consists of a loose tube with water ring packing, resting on a Jenkins seat in the cap of the valve and operating endways by the rise and fall of the float. The flow of the water, which passes through the tube and out between the end of the tube and elastic seat, is cut off by the contact of the end of the tubular valve with the seat, while the water line in the trap is still some inches above the outlet. The valve holds tight, even when the end is quite worn, owing to the fact that the seat is a Jenkins and expansible. To remove the valve it is simply necessary to take out the small bolt in its center and draw out the valve with a hook. This valve may be easily turned up in a lathe, in a few moments the seat renewed and the valve made practically new without starting a gasket, bolt or pipe.

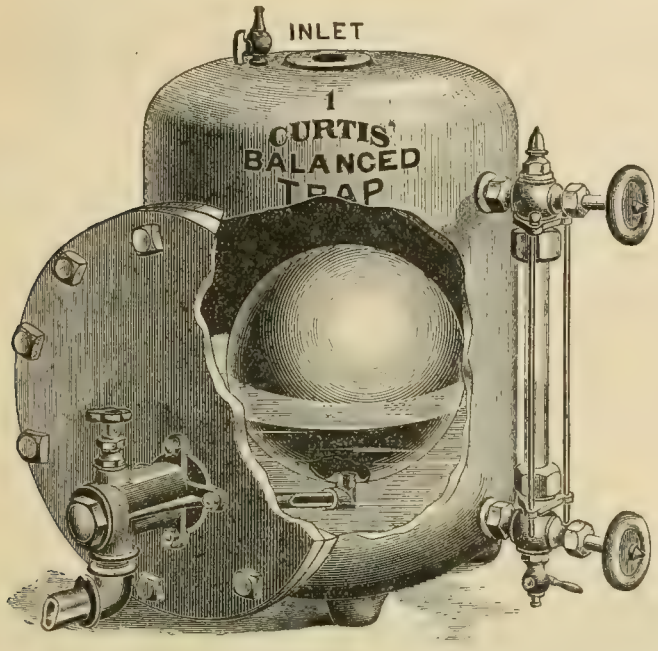


Fig. 1.—THE CURTIS STEAM TRAP.

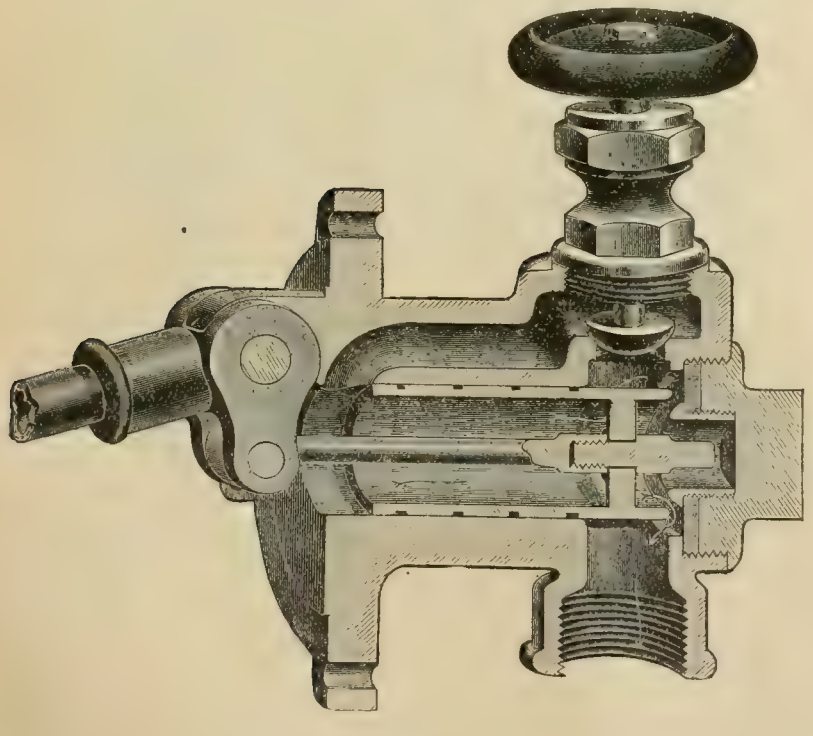


Fig. 2.—SECTIONAL VIEW OF VALVE.

In order that the water may be drained off when the discharge valve is closed, and work continued, the trap is provided with an independent passage or by pass controlled by a stop valve.

The float is made by an original process in which the ball is constantly rotated while the copper is electrically deposited, thus securing an absolutely uniform thickness. It is large, heavy, perfectly spherical, hardened by the rolling process, so that it is hermetically sealed, and will remain tight and strong at a pressure of 200 pounds. Each trap is provided with a glass water gauge so that the amount of water by which the trap is sealed may be seen at a glance. The traps are particularly adapted for use in dry rooms, drying cylinders and buildings, taking care of large quantities of water and delivering it very hot to a tank or returning it to the boiler, and also on stacks of pipe for indirect radiation with or without a blower. They will work against any head pressure less than the direct pressure in the trap. The trap is often used in large plants as a water line trap when there is necessity of balancing any particular circulation, thereby preventing snapping and cracking in pipes and radiators. This may be accomplished by connecting to the top of the trap the direct steam pipe and bringing the return below the water line of the trap.

Senator Chandler of New Hampshire fathered a motion last week in the Senate to instruct the Committee on Commerce to inquire into the expediency of construction, in the near future, of an interior coast line of waterways across the head of the peninsula of Florida, along the coast from Florida to Hampton Roads, between Chesapeake Bay and Delaware Bay and by Cape Cod. The idea is to use in part the vast system of salt-water sounds extending from Chesapeake Bay to Florida, which can at a comparatively small cost be connected by short canals, and so afford an advantageous Atlantic coast waterway, which would be of great commercial and military advantage. Government aid would be required to carry out the project.

From the agricultural statistics lately published we learn that of a total of 8,086,837 acres of cultivated land in the State of Texas, 4,520,310 acres were, in 1892, devoted to cotton and 3,166,353 to corn. The farm products from this area, during the 12 months, were valued at nearly $131,500,000, an increase of $30,000,000 over the returns for 1888. During those four years there was an increase of 13 per cent. in acreage, and of 18 per cent. in the number of farmers. The Lone Star State has been thus steadily increasing her production and adding to her wealth during these years of Southern depression in a most satisfactory fashion, which promises well for her future prosperity.

PLUMBING and GAS FITTING.

New York State Plumbing Law.

The plumbers of this city, and those in the other cities of the State as well, are interested in the statute known as Chapter 620 of the Laws of New York State. This famous law, which provided for the examination and registration of plumbers, was through the efforts of Col. Geo. D. Scott and Mayor Gilroy, superseded by a similar law, extending the time of registration to September 1, 1893, from March 1, 1893. This change of date was made necessary on account of the delay under the former administration in bringing the law into operation. We have many inquiries about the text of this law, and as no copies can be obtained from the State authorities, or elsewhere that we know of, we print it in full, as follows:

An Act to Secure the Registration of Plumbers and the Supervision of Plumbing and Drainage in the Cities of the State of New York.

The people of the State of New York, represented in Senate and Assembly, do enact as follows:

SECTION 1. Within 90 days after the passage of this act it shall be the duty of the Mayor of each of the cities of this State to appoint a board for the examination of plumbers for such city where such board shall act, to be known as the "Examining and Supervising Board of Plumbers and Plumbing," excepting in the cities of New York, Brooklyn and Albany, where it shall be known as the "Examining Board of Plumbers." Such board shall consist of five persons, of whom two shall be employing or master plumbers of not less than ten years' experience in the business of plumbing, and one shall be a journeyman plumber of like experience, and the other members of said board shall be the chief inspector of plumbing and drainage of the Board of Health of such city and the chief engineer having charge of sewers of said city, but in the event of there being no such officers in such city, then any two other officers having charge or supervision of the plumbing, drainage or sewerage whom the Mayor shall designate or appoint, or two members of the Board of Health of such city having the like duties or acting in like capacities. The term of office of the master and journeymen plumbers first appointed under the provisions of this act shall be as follows:

One shall be appointed for one year, one for two years and one for three years, their terms of office to expire respectively one, two and three years from and after the thirty-first day of December of the year in which such appointments shall be made, and the Mayor in making the first appointments shall for each one so appointed specify the duration of the term of office to which he makes said appointments respectively, and annually thereafter upon the expiration of the term of office of any such member of the board his successor shall be appointed by the Mayor for the term of three years, or until a successor shall be appointed, and the Mayor shall have the power to fill any vacancy caused in such Board of Examiners by the death, removal, inability to act, resignation or removal from the city of any member thereof, and such appointment shall be for the unexpired term.

Such Chief Inspector of Plumbing and Drainage, and such Chief Engineer in charge of sewers, or the officers holding equivalent positions or acting in like capacities, designated or appointed by the Mayor as herein provided, shall be deemed to be also *ex-officio* members of such Examining Board, and when they shall cease to hold the offices by reason or on account of which they were so designated or appointed, their successors shall act on the Examining Board in their stead.

SEC. 2. It shall be the duty of such *ex-officio* members of the Board of Examiners to discharge their duties as members of this board without compensation therefor. The master and journeymen plumbers serving as members of such board shall severally be paid at the rate of $5 per day for each day's services when actually engaged in the performance of the duties pertaining to the office, but such compensation shall not exceed the sum of $5 per month in cities of 100,000 inhabitants or less, nor the sum of $10 per month in cities having a population of over 100,000 and less than 300,000, nor a sum of $20 per month in cities having a population of over 500,000.

SEC. 3. All the members of such board shall be citizens and actual residents of the cities in which they are appointed.

SEC. 4. The several Boards of Examiners constituted under this act shall have power and it shall be their duty:

1. *Meetings.*—To meet at stated intervals in their respective cities; they shall also meet whenever the Board of Health of such city, or the Mayor thereof shall in writing request them so to do.

2. *Examinations.*—To have jurisdiction over and to examine all persons desiring or intending to engage in the trade, business or calling of plumbing as employing plumbers in the city in which such board shall be appointed, with the power of examining all persons applying for certificates of competency as such employing or master plumbers or as inspectors of plumbing, to determine their fitness and qualifications for conducting the business of master plumbers or to act as inspectors of plumbing, and to issue certificates of competency to all such persons who shall have submitted to and passed a satisfactory examination before such board and shall be by it determined to be qualified for conducting the business as employing or master plumbers or competent to act as inspectors of plumbing.

3. *Plumbing Code.*—To formulate, in conjunction with the local Board of Health of the city in which it shall act, except in New York, Brooklyn and Albany, a code of rules regulating the work of plumbing and drainage in such city, including the materials, workmanship and manner of executing such work, and from time to time to add to, amend or alter the same.

4. *Fees.*—To charge and collect from each person applying for examination the sum of $5 for each examination made by said board, and all moneys so collected shall be paid over by the board monthly to the chamberlain or treasurer of such city in which said board shall be appointed

SEC. 5. Any person desiring or intending to conduct the trade, business or calling of a plumber or of plumbing, in any of the cities of this State, as employing or master plumber, shall be required to submit to an examination before such Board of Examiners as to his experience and qualifications in such trade, business or calling; and after March 1, 1893, it shall not be lawful in any city of this State for any person to conduct such trade, business or calling unless he shall have first obtained a certificate of competency from such board of the city in which he conducts, or proposes to conduct, such business.

SEC. 6. On or before March 1, 1893, every employing or master plumber carrying on his trade, business or calling in any of the cities of this State shall register his name and address at the office of the Board of Health of the city in which he shall conduct such business under such rules and regulations as the respective Boards of Health of each of the cities of this State shall respectively prescribe, and thereupon he shall be entitled to receive a certificate of such registration, provided, however, that such employing or master plumber shall, at the time of applying for registration, hold a certificate of competency from an Examining Board; but such registration may be canceled by such Board of Health for a violation of the rules and regulations for the plumbing and drainage of such city duly adopted and in force therein, after a hearing had before said Board of Health, and upon a prior notice of not less than ten days, stating the grounds of complaint and served upon the person charged with the violation of the aforesaid rules and regulations; but such revocation shall not be operative unless concurred in by a majority of the local Board of Examiners.

And after March 1, 1893, it shall not be lawful for any person to engage in, or carry on the trade, business or calling of an employer or master plumber in any of the cities of this State unless his name and address shall have been registered as above provided.

SEC. 7. Within 60 days after the organization of such Examining Board in any of the cities of this State the local Board of Health, or the Commissioner or the Commissioners of the Board of Health or the Health Department thereof, as the case may be, shall detail, designate, or appoint for the purposes of this act and the enforcement of the provisions thereof and the work of inspecting the plumbing and drainage of buildings, in said city, an inspector or inspectors of plumbing, subject, however, to the provisions or limitations of existing laws regulating the appointment of inspectors by such Commissioner or Commissioners or Board or Department of Health of such city.

But all inspectors of plumbing so detailed, designated or appointed, and all inspectors of plumbing hereafter appointed, except in New York, Brooklyn and Albany, shall be practical plumbers not engaged directly or indirectly in the business of plumbing during the period of their appointment, and they shall be citizens and actual residents of the city in which they are appointed, and before entering upon the discharge of their duties, as such inspectors, each shall be required to obtain a certificate of competency from said Examining Board. They shall be entitled to receive compensation not exceeding $5 per day for each day of actual service, to be fixed by the board, commissioner or department making such appointment.

SEC. 8. The duties of the inspector or inspectors of plumbing appointed under the provisions of this act, in addition to the duties prescribed by law, and those which may be enjoined or required by the Commissioner of Health, the Board of Health or the Health Department of the city in which they shall be appointed, shall be to inspect the construction and alteration of all plumbing work performed in such city subsequent to the passage of this act, and to report in writing the results of such inspection to the said Commissioner of Health or the Board of Health or the Health Department of their respective cities; they shall also report in like manner any person engaged in or carrying on the business of employing plumber without having the certificates herinbefore mentioned.

SEC 9. All certificates of registration issued under the provisions of this act and all licenses authorizing connections with street sewers or water mains shall expire on the thirty-first day of December of the year in which they shall be issued, and may be renewed within 30 days preceding such expiration, such renewals to be for one year from the first day of January in each year.

SEC. 10. Whenever any inspector or other person reports a violation of any of said rules and regulations for plumbing and drainage, or a deviation from any officially approved plans or specifications for plumbing and drainage filed with any board or department, the local Board of Health shall first serve a notice of violation thereof upon the master plumber doing the work, if a registered plumber. Such notice may be served personally or by mail, and if by mail it may be addressed to such master plumber at the address registered by him with local Health Board; but the failure of a master plumber to register will relieve any Board of Health from the requirement of giving notice of violation. Unless the violation is removed within three days after the date of serving or mailing such notice, exclusive of the day of mailing or serving, the Board of Health may proceed according to law.

SEC. 11. From and after March 1, 1893, the plumbing and drainage of all buildings, both public and private, in each of the cities of this State shall be executed in accordance with the rules and regulations adopted by the local Board of Examiners in conjunction with the Board of Health for plumbing and drainage; and all repairs and alterations in the plumbing and drainage of all buildings heretofore constructed shall also be executed in accordance with such rules and regulations, except in New York, Brooklyn and Albany, where the Board of Health shall have control; but this section shall not be construed to repeal any existing provision of law requiring plans for the plumbing and drainage of new buildings to be filed with any local Board of Health and to be previously approved in writing by said Board of Health, and to be executed in accordance therewith, except that in case of any conflict between such plans and the rules and regulations of the Board of Examiners, the latter shall govern.

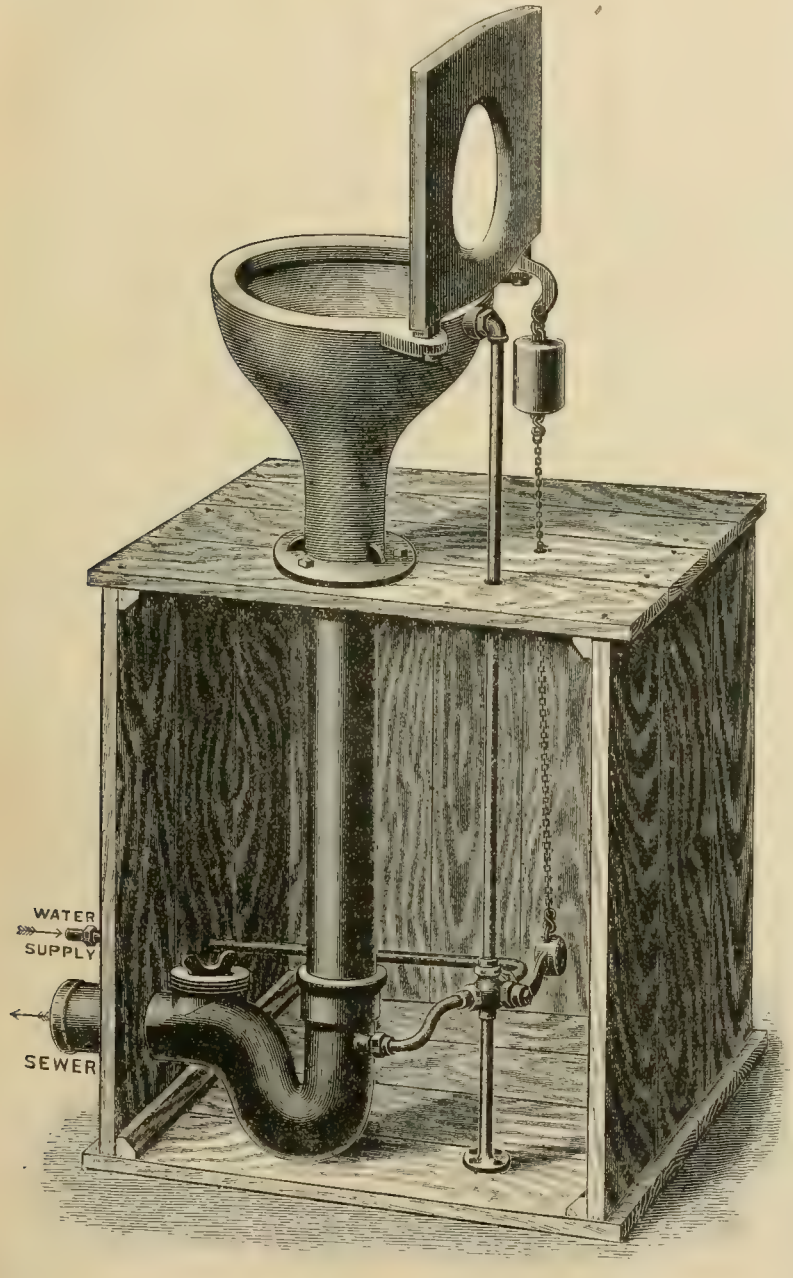
SEC. 12. Each of such Boards of Examiners shall have power to secure suitable quarters for the transmission of business, to provide the necessary books and stationery and to employ a clerk to keep such books and record the transactions of such board. The Board of Estimate and Apportionment of the City of New York and the Common Council of all other cities shall annually insert in their tax levy a sufficient sum to meet the expenditures incurred under the provisions of this act; and all expenses incurred by the several Boards of Examiners in the execution and performance of the duties imposed by this act shall be a charge on the respective cities, and shall be audited, levied, collected and paid in the same manner as other city charges are audited, levied, collected and paid.

SEC. 13. Any person violating any of the provisions of this act or any rules and regulations of the Board of Health or of the Board of Examiners in any city regulating the plumbing and drainage of buildings of such city, shall be deemed guilty of a misdemeanor and upon conviction, if a master plumber, shall, in addition, forfeit any certificate of competency or registration, which he may hold under the provisions thereof.

SEC. 14. After the passage of this act the Commissioner of Public Works of any city, or the officer or officers acting in a like capacity in any of the cities of this State, and having charge of the sewers and water mains, shall not issue a license to any one to connect with the sewers or with the water mains of such cities unless such person has obtained and shall produce a certificate of competency from the Examining Board of such city hereby created.

SEC. 15. All acts or parts inconsistent with or repugnant to the provisions of this act are hereby repealed.

SEC. 16. This act shall take effect immediately.



The Kelly Frost Proof Closet.

The Kelly Frost-Proof Closet.

Thos. Kelly & Bros., 122 Franklin street, Chicago, have invented and are putting on the market the Kelly frost-proof closet, as herewith illustrated. The closet is intended to take the place of privy vaults, and is made ready to put up, as shown in the accompanying engraving. When placing the closet in position it is only necessary to connect the trap with the sewer and supply pipe with the water supply. The operation of the closet is as follows: While the seat is occupied the inlet side of the Kelly hopper cock is opened and the waste end closed. The water runs into the top of closet through the vertical pipe until the seat is vacated, when the weight raises the seat and closes the supply, at the same time opening the waste, which allows the water to drain from the pipe above the valve. The water pressure tends to close the inlet ball, which prevents waste of water and leakage. The Health Department of Chicago have adopted this closet and now compel the abandonment of privy vaults where sewers are accessible.

Chicago Master Plumbers.

The Chicago Master Plumbers' Association, who are well known for their energy in promoting the interests of their organization, have issued a circular letter to the members of the plumbing trade in Chicago, with a view of still further enlarging the membership of the local association. The circular, signed by President T. B. Culloton, begins with an account of the Master Plumbers' Association, from which we quote as follows:

"The first Association of Master Plumbers in Chicago was organized in 1860, represented by 25 firms engaged in the plumbing business, many of whom are now dead, and a few are members of the present Chicago Master Plumbers' Association, which was organized in 1882, for the purpose of establishing a closer business and social relation to one another, mutually benefiting its members by the more thorough understanding and enforcement of principles, rules and regulations for transacting the business of plumbing and protecting themselves by all lawful and honorable means, and to maintain a high and honorable standing among the mechanical industries of the State. How far this association has progressed in the benefiting of the trade, as well as the public, we will investigate. During the last quarter of a century, owing to many causes, among which may be mentioned the introduction of 'manufactured goods' in place of hand-made goods, unfair competition, fraud and dishonesty, irregular labor market, &c., our trade, as a whole, had degenerated until it had (in contradiction of the very general belief) arrived at that point where a business man engaged in plumbing must do one of two things, cheat and defraud, or fail to make a bare living profit."

To remedy this state of affairs, which was of gradual growth, concerted action was taken and the Baltimore resolutions were adopted. In the circular issued by President Culloton a copy of the resolutions is then presented. Following this the circular proceeds to tell what great benefit has resulted from these resolutions in the matter of business prosperity. Returning to the technical part of their trade, the circular proceeds as follows:

"Laws have been enacted in nearly all of the cities and many of the States governing the construction and placing of plumbing fixtures. Here in Chicago plumbing has been advanced remarkably; it is needless for me to go into

details, as you are all familiar with the rules and regulations governing same, all of which has been advocated, introduced and passed by the City Council through the efforts of the Chicago Master Plumbers' Association. There is a great deal more work yet to be performed to elevate our trade. We must do away with our earthen sewer pipe inside of buildings and substitute iron. Abolish the privy vaults where sewers are in adjoining streets and compel water closets to be used instead. A house to house inspection each year, and made compulsory on tenants and landlords to put plumbing in a sanitary condition in keeping with the laws. Examination before licenses are issued and a certificate of qualification given before same is granted. A suitable number of practical plumbers as plumbing inspectors, who will rigidly enforce the plumbing laws. All these, gentlemen, and many more questions, must be put through the Common Council and enacted into laws in order to elevate our trade, which will require the united support of all those concerned. Let the plumbing trade of Chicago be united, let each and every person carrying on the plumbing business be enrolled in the Chicago Master Plumbers' Association, giving support thereby to its officers, and instruct them what work they must perform, and back them up with all your force and main in order to place the plumbing trade in the highest plane of usefulness, unsurpassed by any other business in the land."

Clambake of the New York Master Plumbers.

A generous representation of the Association of Master Plumbers of New York took the 8.45 a.m. train at the Grand Central Depot for the Rhode Island clambake, at Rye Beach, N. Y., on Tuesday, August 29. The affair was in charge of a committee composed of Joseph W. O'Brien, James N. Knight, Henry J. Pattison, Henry G. Gabay and Alexander Bryant, who acted as treasurer and issued the invitations. The early portion of the day was spent in social and athletic enjoyment. In the game of baseball the trap for the ball was not always sealed, which gave free vent to hilarity.

All had a jolly time, and by 4 o'clock, when a charge was ordered on Betz Hotel, at the grove, there were no stragglers. Not the least pleasant of the diversions was the entertainment prepared by the committee. The officers of the association, President Henry G. Gabay, Vice-President Thomas J. Tourney, Recording Secretary Henry J. Pattison, Financial Secretary Thomas J. Cummins, Treasurer James N. Knight, Marshal Thomas F. Gaynor, and Sergeant-at-Arms Charles Schlosser, rendered yeomen's service in attending the members and their guests. Among the guests were several of the city officials: Col. Geo. D. Scott, Louis A. Hornum and Henri D. Dickinson of the Bureau of Plumbing and Ventilation, Nicholas R. O'Connor, Frank Vanahan, Geo. Hackett and J. Campbell of the Department of Public Works, and Major W. Bullard and A. Lucas of the Board of Health, and J. E. McGovern, John McKenna and John Crowley from the Journeymen Plumbers' Association. No time was left for speech making after the good things disappeared, but some of the good things that will not vanish are the prizes that are yet to be awarded to the winners of the contests.

THE DIFFERENCE between the master plumbers and the journeymen at Norfolk has been satisfactorily adjusted.

Trap Ventilation.

We have the following communication from Wm. Paul Gerhard of New York:

In the paper entitled "A Review of Recent Plumbing Practice," read by Mr. Glenn Brown, P.A.I.A., at the World's Congress of Architects in Chicago, and reprinted in a recent issue of your journal, Mr. Brown asserts that "I practically avoid in my works the question of trap ventilation."

This statement is erroneous and misleading and shows that Mr. Glenn Brown has either not read my books carefully or else that he has not taken the trouble to understand correctly the opinions expressed by me regarding the "back airing" of traps.

It is, in my judgment, only a question of time when all plumbing regulations will be so changed as to leave it optionary with the owner or architect of a building whether to "back air" his traps, or to adopt the much simpler and safer system of non-syphoning traps.

I have, as early as 1884, gone on record as being opposed to any useless and expensive system of trap ventilation, and have since then repeatedly asserted my belief in, and preference for, non-syphoning traps and a simpler plumbing system.

On page 123 and following of my book "Hints on the Drainage and Sewerage of Dwellings," published in 1884, I expressed my opinion regarding trap ventilation, as follows:

"While admitting that such air pipes render S-traps practically safe against most of the above-made objections, it cannot be denied, on the other hand, that they largely increase the cost of plumbing in dwellings, especially so where fixtures are much scattered throughout the house.

"1. They complicate the work and are difficult to run in old buildings, and must be largely increased in the case of high buildings toward the upper floors.

"2. They increase the evaporation of water in traps, and therefore aggravate the danger from sewer gas entering through fixtures in cases where these remain unused for a long time.

"3. It is quite possible that vent pipes stop up in time at the crown of the trap with splashings from soapsuds, when they will cease to furnish air to break the vacuum. Unluckily, such fact would not reveal itself and is not easily detected, nor is much known at the present time about this point.

"The literature on this subject has been lately enriched by numerous careful and valuable experiments upon the syphonage of traps made by Col. George E. Waring, Jr., assisted by the writer, by Edward S. Philbrick, C. E., and Ernest W. Bowditch, C.E., of Boston; by S. Hellyer of London, England; Dr. Lissauer of Dantzic, Germany; Dr. Renk of Munich, Germany, and others.

"The results of the first-mentioned experiments are greatly at variance, and seem to indicate that while in some cases traps need a strong protection against syphonage, in other cases, especially where the soil and waste pipes have ample ventilation and branch wastes are very short, such protection is not required. At any rate it is too early yet to establish rules which apply to all cases. *It has always seemed to me as if it would be feasible to practice a wise discrimination.*" (The italics are not in the original.)

"Where a fixture is located remote from a vertical pipe, and consequently discharges through a long run of waste pipe, which would otherwise form a 'dead end,' it is positively necessary to run a vent pipe from the crown of the trap upward to the outer air, which prevents in the first place a stagnation of air, and at the same time stops syphonage; and this is true of any kind of trap, not only of the class of traps known as S-traps. It should apply to mechanical traps as well.

"If, on the other hand, such fixture is located quite near to a vertical thoroughly ventilated soil pipe, or a well-ventilated horizontal run of pipe, I should not hesitate to place under the fixture a trap which is not easily syphoned, leaving out the air pipe if there is no vent pipe near by to connect to. Such a course seems especially desirable in the case of high buildings for single fixtures in basements, or on lower floors. For instance, a 1½-inch sink trap in the basement of a flat, such as is now being erected in New York City, 200 feet in hight, would require an air pipe at least 3 or 4 inches in diameter to prevent syphonage, the friction in a 1½ or 2 inch pipe 200 feet long being too great to allow the air to enter quickly enough to break the suction. I would consider it foolish extravagance to use such long length of pipe of such large size for the trap of only a single sink. If a non-syphoning trap could not be made to answer the purpose, the only sensible course to pursue would be to abandon such fixture entirely.

"I must further say that it seems to me dangerous to use vented S-traps with the usual water seal of only 1½ or 2 inches under bowls or tubs in spare or guest rooms of large city residences, and for such dwellings generally that are occupied only a part of the year. This danger is generally disregarded or passed over lightly by enthusiasts for 'back-air piping.' My personal preference in such cases would always be for a non-syphoning trap, with a water seal which does not so easily evaporate, or for a non-syphoning trap with a mechanical seal against gases from the soil pipe, and where rules of local Boards of Health would demand such an air pipe under such conditions, I should probably advise the use of a tight-shutting stop valve on the waste pipe,* and combined with it an arrangement for simultaneous shutting off the hot and cold water supply to the fixture, so as to render an overflow impossible. I am quite ready to admit that the latter arrangement would tend to complicate the plumbing work, but, I think, everybody must concede that, under the conditions mentioned, it would be safer than a vented S-trap with usual slight seal."

In my work, "House Drainage and Sanitary Plumbing," second edition, published in 1884, I expressed a similar opinion, as follows:

"It is always costly and often very inconvenient to run vent pipes to the roof. The plumbing work is greatly complicated and the number of joints which may leak sewer air greatly increased by trap ventilation. There is also danger that the vent pipes for traps under tubs, sinks and bowls may stop up with soapsuds or grease, in which case they would cease to act properly. The continuous current of air in the vent pipe in passing over the water in the trap undoubtedly increases its evaporation. Finally, it becomes necessary, in the case of high buildings, largely to increase the diameter of vent pipes, in order to make up for the loss through friction necessarily occurring with long air pipes. Therefore, while I consider vent pipes for traps a necessary evil in many cases, especially for water-closet traps, I am inclined, in other cases, to prefer a good non-syphoning water-seal or mechanical

* Such a combined trap and shut-off valve is now obtainable in the market.—W. P. G.

trap, provided the soil and waste pipe system has ample ventilation. Such a mechanical or anti-syphoning trap may be used under sinks, tubs and bowls, but for water closets and slop hoppers (if without a strainer) the simple lead water-seal trap, with vent attached, is the only safe device." †

In an article published in the Chicago *Inland Architect* in 1885, and subsequently reprinted in 1887 in my book, "Recent Practice in Sanitary Drainage of Buildings," I stated as follows:

"Experiments have established with a sufficient degree of certainty the fact that the self-cleaning S, P, or running traps cannot be depended upon always to retain their water seal against syphonage, unless air is admitted at the crown and sewer side of the trap, either by some anti-syphoning trap attachment or by a so-called 'back-air' pipe of ample size. Consequently, I should not use such traps without providing such protection as the remedies mentioned afford. Later experiments have shown that an air pipe is not a reliable protection against syphonage in all cases, especially where the course of the air pipe is long and tortuous, and that where fixtures are not in constant use, it furthers the evaporation of the water in traps, and hence endangers the safety of plumbing work. That it increases the cost of plumbing and hinders simplicity of arrangement must be conceded by all. Thus, while it offers certain advantages in some instances, there are other cases where the disadvantages predominate. It remains, then, to be decided, only after a thorough and intelligent consideration of all conditions, whether a seal retaining water-seal trap safe against back pressure, syphonage or other influence, or an anti-syphoning trap attachment of some kind, may not be preferable."

In an article on "The Drainage of a House," published in Boston in 1888 and subsequently reprinted in 1890, in the second edition of the book "Recent Practice," &c., I stated:

"From my best knowledge and belief I cannot accept as universally necessary the requirement of 'back ventilation' of traps. . . I do not fail to explain to my clients that the back airing of traps is done at the expense of simplicity; that in a properly laid out system trap vent pipes are not necessary to prevent dead ends in short lateral waste pipes, and that prevention of syphonage can be accomplished and the extra cost incurred by using back-air pipes be saved in all but rare instances by adopting simple and well known devices.

"Where I am compelled to run back-air pipes, complicating the pipe system, it is always my endeavor to modify the arrangement so as not to expose the water in the trap too much to the air current; for there can be no question that the thereby increased free circulation of air in the vicinity of the sealing water of traps hastens the unsealing, by evaporation, of traps under fixtures which remain unused for some days in succession and endangers the security of all traps during any period when a house is left unoccupied."

The above quotations must convince any unprejudiced person that I am not a blind believer in trap ventilation. They will also suffice to refute the careless assertion of Mr. Brown, that I avoid the question of trap ventilation.

† The many forms of excellent syphon and syphon jet closets now obtainable are constructed with a very deep and effective trap seal, which does not require a vent pipe when the piping is properly arranged.—W. P. G.

TRAPS AND VENTS.

C. L. Burg is occupying his handsome brick building on Seventh avenue, Clinton, Iowa, with his plumbing establishment.

The Board of Health of the town of Beverly, Mass., have appointed Dr. Geo. A. Stickney, D. S. Ingersoll and Robert Robertson a board for licensing and supervising plumbers. The board are at work on a set of regulations that will be presented to the Town Council for adoption.

The Master Plumbers of Albany, N. Y., recently enjoyed a jolly clambake at the Abbey. All of the city officials were invited and the architects, beside many other dignitaries. A ball game, foot races and other sports entertained the guests while the feast provided by the committee in charge was being prepared. Provender was plenty and the consumption cleared both the tables and the minds of the committee of any burden they may have carried. The officers of the local association are: Thomas Hyde, president; Horace T. Westcott, secretary; John Moran, treasurer, and Frank Schimpf, financial secretary.

At a recent meeting of the local union of plumbers and roofers at Albany, N. Y., a number of the master plumbers were present, witnessing the installation of the new officers, who are: M. J. Quinn, president; Daniel Powers, vice-president; John J. Burn, secretary; H. H. Derouvel, recording secretary, and John Roach, treasurer.

The Atlantic Plumbing Company, at Atlanta, Ga., are about to be incorporated, with a capital of $5000, for transacting a plumbing, gas and steam-fitting business, with J. A. G. Beach, M. A. Beach, Allie Wingate, and A. R. Butcher as the petitioners for the charter.

S. W. Holman & Co., plumbers, at Durham, N. C., are about to erect for their business a building 36 x 65 and three stories high.

The Springfield, Mass., Master Plumbers' Association held a meeting in the Board of Trade rooms, August 28, and elected H. G. Briggs treasurer and D. D. Casey secretary. Both offices were held by F. W. Tower, who resigned when he took the position of plumbing inspector. John G. Howland was appointed a committee of one to make arrangements for a clambake to be held near the Watershops pond, September 8.

The stock and plumbing shop of Edward Farley, 68 Greenpoint avenue, Brooklyn, N. Y., was recently damaged by fire.

HEATING AND PLUMBING.

NEW WORK AND CONTRACTS.

Plans for the proposed sewerage system at Macon, Ga., are being prepared by Samuel Gray of Providence, R. I., the estimated cost being about $6500 per mile and about three years will be necessary for laying the 36 miles proposed.

H. E. Bottum has secured the contract for heating the new Island School at Albany, N. Y., at $800.

In the new shoe factory at Ipswich, Mass., M. B. McLaughlin of Lynn did the steam fitting.

A letter from W. J. Goff apprises us that Goff & Taylor, Malone, N. Y., have nearly completed the work on a $7000 sewerage system that they are putting in at the village of Saranac Lake, N. Y. They also have the contract to put in a system of water works at the same place to cost $20,000.

Contract for putting a Richmond steam heater in the High School Building at West Brookfield, Mass., has been awarded to W. A. Putnam of Warren.

The plumbing work in the new shoe factory at Ipswich, Mass., was done by George Sleeper & Co. of Lynn.

The Carman Thompson Company, Rumford Falls, Maine, have recently completed the plumbing work in the office of the Rumford Falls Paper Company and in the new residence of Judge Morrison. The work was done by their foreman, Charles Mobb, and is said to be the finest in the State. The fixtures were all silver plated.

McCullough Bros., Bridgeport, Pa., were recently awarded three steam heating contracts.

John W. Mills, 100 Lake street, Chicago, has the contract for removing the steam heating plant in the St. Joseph Convent, Milwaukee, and substituting five No. 20 Bolton hot-water boilers. There will be about 11,000 feet of radiation used in the building.

The Smith & Anthony Stove Company, proprietors of the Sanitas plumbing specialties, are to furnish through their Chicago branch, 219 Lake street, J. A. Cunningham manager, 37 Sanitas closets and 175 Sanitas traps for the Old Colony Building at Dearborn and Van Buren streets, Chicago.

The toilet rooms in the stations of the Chicago Metropolitan and Lake street elevated railroads are to be wainscoted with Italian marble and furnished with the Wade flushing washbowls, improved basin cocks and syphon jet closets. All exposed work is to be nickel plated, and the sewer, soil and waste pipes are to be ventilated in the most thorough manner. The plumbing work in these stations is to be done by J. J. Wade & Son, 298 Dearborn street, Chicago, who have also contracts for the plumbing in the Old Colony Building, Boyce Building, Watson Building, Kedzie Building, Newberry Library and others. The same firm are also overhauling the plumbing in the Pullman Building and putting in the Wade sewer flushing system.

Howell, Shanklin & Dowman, Charleston, Kanawha County, W. Va., report an excellent run of business during the month of August, among the jobs being the steam heating and plumbing for the Kanawha Valley Bank Building at a price of $4160; steam heating for the Kanawha National Bank Building, $1150; four hot-water heaters for dwellings aggregating $2400. For these and other jobs the firm are now in the market to buy nearly 10,000 square feet of direct radiation for steam and hot water.

E. J. Brady of New York is putting a No. 5 Mahony steam boiler in one of Dennett's restaurants at Philadelphia.

Some of the plumbing contracts that are now being filled by Macdonald & Co., 296 Third avenue, New York, are the John L. Downey Building, at Pine and Front streets and the Home Life Insurance Building, at Broadway and Warren streets, which will have the Durham screw-joint pipe system of drainage. Cast-iron pipe will be used in the Bowery Savings Bank, at Bowery and Grand streets and at the addition to the Buckingham Hotel, at 615 Fifth avenue.

Jas. Holland has secured the contract for the plumbing in the new jail at Watseka, Ill.

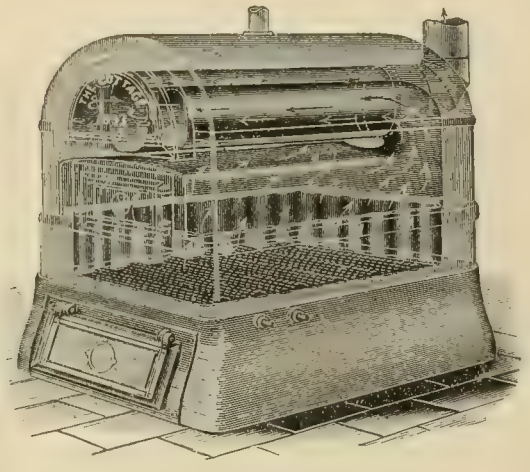
STEAM AND HOT WATER.

The Etna Combination Hot-Air and Hot Water Heater.

A circular from Wood, Bishop & Co., Bangor, Maine, shows their Etna furnace and their method of combining hot air and hot-water heating. A brief description says the fire pot is made in two parts, and the upper part being hollow makes the water chamber. This location exposes it to the full effect of the fire. The water enters the water heater and passes around to the opposite side, becoming heated and ready to pass off through the pipes to the radiators. By the insertion of this device rooms located at a distance from the heater to the north or west can be thoroughly warmed. A lever working draw-center grate reduces the labor of attending the fire and prevents dust, as the ash door need not be opened. Above the fire pot is a wide expanse of surface for heating air and so arranged as to utilize the heat of the gases. The drafts are so arranged that they can be opened or closed to any desired extent from an upper room. A novel arrangement of having a water pan inside and outside of the furnace casing and connected at the bottom avoids the probability of the supply becoming exhausted unnoticed and is convenient to replenish when it does. A number of letters expressing satisfaction with the heater in use is a feature of the circular. The Etna is made in six sizes, Nos. 3½, 4, 4½, 05, 5 and 6, and the claim is made that either examination or practical test will discover a first-class heating apparatus.

The Cottage Boiler.

Our illustration shows a new boiler that is being placed on the sample floors of the H. B. Smith Company, 133–137 Centre street, New York, and for which they were granted patents June 6, 1893. The three different sizes are painted red, white and dark brown, and enlivened by gilt stripes they present an attractive appearance. The boiler is complete in three sections. The ash-pit section is deep, and contains a Reed grate, which consists of a bar supporting a series of disks. The ends of the first two grate bars extend through the ash pit on the right-hand side, and as every alternate grate bar is connected with these two, a lever used on first one and then the other agitates the entire bed of the fire. The ash door is arranged to lift when attached to a lever operated by a draft regulator. A water section rests on the ash pit and forms the fire chamber, being a hollow square with the feed door at the front. At the back it is tapped to receive the return pipe at two points, and the inner surfaces are corrugated to present a larger surface to the fire. This section is connected to the dome section, which rests on it, by wrought iron push nipples at four points, forming a connection that, it is claimed, is at once strong and durable. The dome section is a novel construction cast in one piece through ingenious core work and foundry skill. It is a hollow casting with an arched roof and covers the fire chamber entirely, with two openings at the back which lead into oval flues which run to a chamber at the front, from which a central return flue runs to the smoke outlet at the back. This section might well be termed a tank over a fire with heating pipes running through it. The smoke and gases passing through the flues impart their heat to the water before they escape. A door at the front opening into the flue chamber enables them to be readily cleansed. In the top of the dome section are two openings tapped for the flow pipes. The grate surface is respectively 16 x 16, 16 x 20 and 16 x 24 inches, and the capacity is rated at 250, 325 and 400 square feet of radiating surface.



The Cottage Boiler.

A New Business Plant.

On completing his new storerooms, machine shop and pipe warehouses at 452–454 and 435–437 Water street and 187–189 Cherry street, Edward F. Keating issued from his office, at 75 John street, New York, invitations to the trade to inspect the plant.

On Tuesday, August 29, the manufacturers and jobbers of goods used in fitting for steam, water, gas and oil were received. The head of the house, E. F. Keating, was aided in dispensing hospitality by his genial corps of assistants, J. T. Keating, manager; Henry Currier, F. H. Fairweather, Wm. Smith, Wm. Campbell, John Hogan and Superintendent Thomas McGrath. Among the guests present on Tuesday were Mr. Knight of Knight & Jillson, Indianapolis; Mr. Kelly of the Kelly & Jones Company of Pittsburgh; J. B. Murphy of the Crane Company, Chicago; Mr. Wells of Wells & Coutan, Fred. Rogers of H. A. Rogers, Mr. Richards and Mr. Pancoast of Pancoast & Rogers, New York. No difficulty was experienced in locating the plant, as a substantial, freshly renovated and newly painted brick building, 55 x 120 feeet, of six stories and a basement, was conspicuous fronting on Water street and extending through to Cherry street. On the opposite side of Water street, a few doors below, is the pipe storehouse. A half circle made by slitting lengthwise a piece of A. M. Byers & Co. full-weight 20-inch pipe extends across all three of the street fronts and is painted black, bearing in large letters "Edward F. Keating," with the words "Full weight" at each end. This makes an attractive sign and brings into prominence the full-weight pipe, which is made a specialty. Smaller signs at each side of the entrances state that everything is furnished that is required for fitting steam, water, gas and oil systems.

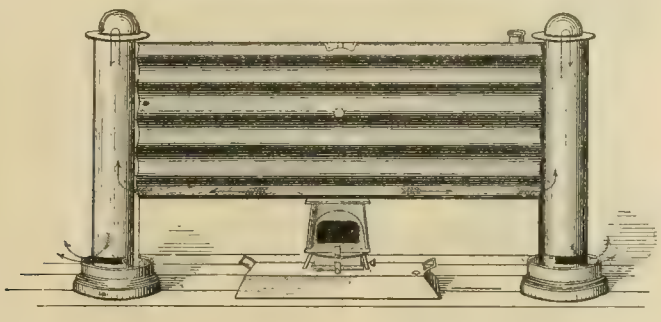
At the pipe storehouse, which is 50 x 130 feet, pipe from ¼ inch to 12 inches is stored. The building is divided into two long, narrow sections and a system of traveling cranes is used, operated by electricity from the main plant, by which one man can load or unload a truck with the largest size of pipe. At the main building the basement is fitted up according to plans perfected by Mr. Keating from his experience with what is necessary in a pipe machine shop. The tools consist of a lathe, two drills, two tapping machines, ten 2 inch, two 8-inch, one 12 inch and one 16-inch D. Saunders' Sons latest improved pipe-cutting machines. In the shop is a system of overhead trolleys and switches that takes the material from the point where it is received to any or all of the machines in the shop. Pipe bending, radiating coils and all pipe work is done here and a plant for testing the work under pressure in used to prove its tightness. A 110 horse-power Hewes & Phillips' engine is used to furnish power and to drive a dynamo for lighting and running the pipe storehouse traveling cranes. An elevator at each end of the building furnishes transportation. On the first floor, at the front, is the superintendent's office and salesroom, the balance being used for a well-arranged system of bins for storing brass goods. The second floor is used for storing pipe fittings, malleable, cast and galvanized, the variety carried overflowing to the third floor. Some idea of the variety and quantity of stock carried may be obtained from the fact that the bin for storing 1¼-inch tees

holds 11 barrels, and that fittings, flanges, valves, &c., can be furnished for pipe up to 20 inches. The fourth floor is devoted to steam traps and kindred sundries.

The fifth will never be devoted to any more pleasing supplies than were found by the guests, a repast that was the more appreciated as it was unexpected. The lubricants were of the anti friction character, and a smoke was furnished that cleared away in fragrance without any damage being done. The guests enjoyed a view of the East River and the lower bay from the sixth floor, which is as yet unoccupied except by good wishes and congratulations left by them. On Thursday, the 31st, the steam fitters and other customers of the house were entertained with the same liberal hospitality, and notable representatives of the craft were present.

English Individual Radiator.

To one of our foreign contemporaries we are indebted for the accompanying illustration of what is termed the



English Individual Radiator.

Little Samson hot-water heating apparatus. The description of the heater in our exchange is altogether inadequate, so our readers must rely upon the engraving for an idea of the article. Such information as is given, however, we reprint. The radiator is described as simple in construction, composed of two sheets of corrugated metal placed together so as to form a water space between them. This horizontal waterway is fixed over the burner of a lamp or gas jet and becomes heated and retains the heat so long as the lamp or gas is kept burning. The illustration shows the course taken by the products of combustion, which pass along a channel under the radiator, up the side pillars and then down again into the room. The apparatus is made for both lamp and gas flame to do the heating, the illustration herewith showing the lamp construction.

HEATING NOTES.

Among the other things exhibited at the World's Fair at Chicago by Abendroth Bros., New York, is the Andrus water heater, which excites considerable interest, resulting in daily inquiries by mail for additional information.

The Portland Foundry & Machine Works have purchased the foundry stock of the Dirigo Heater Company of Portland, Maine. The Dirigo Heater Company have given up foundry work as a specialty and will confine themselves solely to turning out their special branch in the heating line.

The Fuller & Warren Company, Troy, N. Y., issue a pamphlet relating to their hot-water and combination warm-air and hot water heaters. The volume is a neat publication of some 70 pages and begins with a general account of hot-water heating, its advantages over other systems of warming and the notable features in the Fuller & Warren Company apparatus. Proceeding to the catalogue proper there is given at first a description of the Fuller & Warren Company hot-water heaters Nos. 250, 300 and 350, with double section and single section with galvanized casing. Then come broken views of the separate sections, after which are given illustrations with descriptive particulars of their hot-water heater No. 17. In an early part of the book are sectional views of residences and houses, showing the application of the Fuller & Warren Company apparatus to the warming of dwelling houses. Later on cuts are given showing the hot-water heaters Nos. 12 and 15 as applied to laundries, greenhouses, conservatories, &c. At the end of the pamphlet their combination warm-air and hot-water heater is described, the volume closing with a long list of testimonial letters. A supplementary page, arranged to be torn out, contains blanks for estimate of heating.

Nason Mfg Company, 71 Beekman street, New York, manufacturers of iron pipe, fittings, and specialties for steam and hot-water heating, report an exceedingly good season's business in their line. Their sales have exceeded those of last year, notwitstanding the prevailing depression in trade.

A fine display of radiators is made in the showrooms of Mulhern, Piatti & Kirk, 144 East Forty-second street, New York. They are selected from different houses, the A. A. Griffing Iron Company being represented by the Bundy, Renaissance, Bundy Elite, Bundy and the Pyro wall radiators. Those selected from the line of the American Radiator Company are the National, National single column, Detroit, Perfection, Ideal and Ideal box base direct-indirect radiators. The Union and Royal Union radiators represent the H. B. Smith Company. In the many different colors of bronze and other colors used in decorating the radiators a very handsome effect is produced, and a customer of æsthetic taste can be gratified.

F. W. Lamb & Co., manufacturers of steam heating apparatus at 258 Michigan street, Chicago, made a voluntary assignment in the County Court on the 25th ult. August Kehm was appointed assignee to take charge of the firm's property, and assets were scheduled at $50,000, with liabilities of $32,000. The failure is attributed by the attorney for the assignee to the dullness of trade and slowness of collections. An effort will be made to resume business by agreement with the creditors.

The Perfection Radiator.

We show in the accompanying illustration a general view of the new radiator which has just been put upon the market by Levi Hey & Co. of 311 and 313 State street, Rochester, N. Y. The construction of the device is referred to by the manufacturers as being very simple, consisting as it does of two drums connected by a series of vertical pipes. The latter are kite-shaped in cross section, which admits of their being arranged in a cluster or group, as indicated in the engraving. Space is thus utilized to good advantage while the radiating surface resulting is large. The pipes are placed with the narrow portion inward, which compels the hot air to seek the larger area, bringing it to the outside surfaces. The pipes are connected to cast-iron heads

The Perfection Radiator.

by fitting over raised flanges, and are held together by a rod passing through the center. The manufacturers state that they now place a drum over another raised flange on the opposite side of these heads, and then a second cast-iron head on the other end of the drums, making both ends of the radiator alike. The cast-iron heads are held together by three bolts, those used in connection with the lower heads passing through for the purpose of holding the feet of the radiator in place. The end heads are provided with collars to fit the different sizes of pipe, so the hot air passing from the smoke pipe through the lower end head enters the lower drum, then divides, and, passing through an opening in the next head, enters the pipes and so on through them to the top drum, thence to the top head and finally escaping to the smoke pipe. The radiator here shown is known under the name Perfection, and it is claimed that when attached to the smoke pipe just back of the stove the efficiency of the latter will be largely increased. Reference is made to the economy resulting from the employment of the radiator and to its constantly growing popularity with the trade.

THE RETAIL STORE.

Rochester Lamp Stoves

The illustrations herewith show some new heating and cooking oil stoves just being put on the market by the Rochester Lamp Company, 42 Park place, New York. All of these stoves are an adaptation of the well-known Rochester lamp, consequently have all of the advantages resulting from a seamless brass oil tank, the central draft tube, the perforated cone burner, the circular wick and the Rochester draw bar or wick lift. Fig. 1 shows the Rochester parlor heater, which is made from the mammoth fount lamp, with its chimney and all just as it would be lifted from a bracket or pennant and set in a handsome orna

Rochester Lamp Stoves.—Fig. 1.—General View of Parlor Heater.

mental fret work nickel shell base. The latter has handles for carrying when necessary. At the base of the chimney is a brass perforated plate, to receive the Russia iron body, which is perforated at the top and bottom and finished with an ornamental top. In operation the air passes in the lower openings and is heated in its passage between the hot glass chimney and the casing, when it is discharged into the room, which is warmed by the circulation of the heated air. The top is so arranged that it can be removed and any ordinary boiling or cooking done. This stove is 31 inches high and weighs 9 pounds. Fig. 2 shows the Rochester No. 3 oil stove, with heater, which is one of the maker's best lamps. It can be taken from a bracket and set in a handsome nickel-plated cast-iron base and still be used as a lamp. It may, if so desired, be

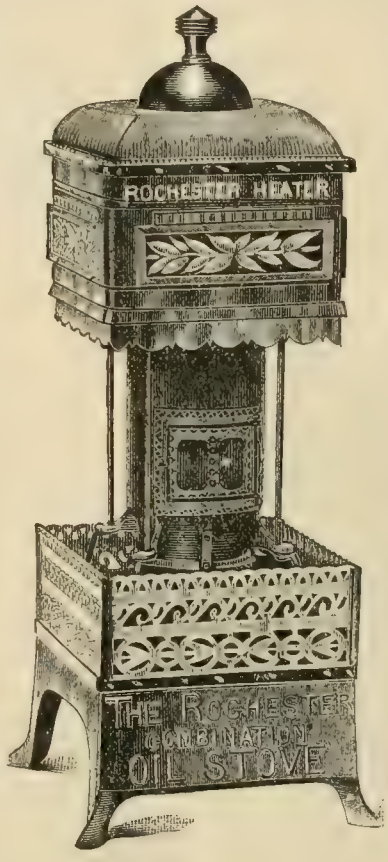


Fig. 2.—Rochester No. 3 Oil Stove, with Heater.

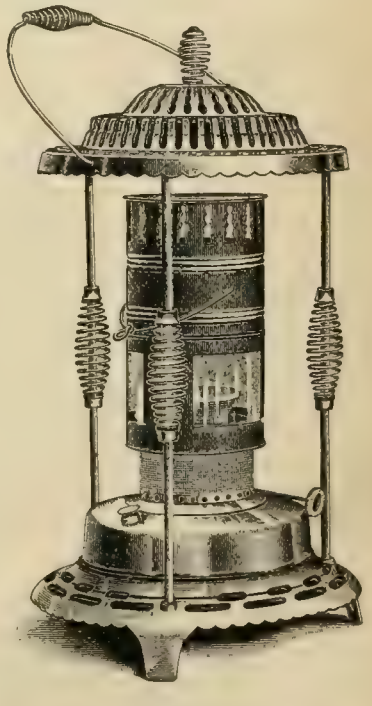
divested of its glass chimney and the Russia chimney and stand substituted,

Fig. 3.—No. 2 Rochester Lamp Stove.

when the ornamental heating attachment, or an oven for baking, can be set in place. Or, dispensing with these, ordinary boiling and cooking can be done. The oil tank in this stove and the one described above each hold 1 gallon, which is said to last ten hours when running full. Fig. 3 shows the Rochester lamp stove, which also has a brass tank and is constructed on the Rochester principle. It can be used as a lamp, or the chimney can be removed and the cooking stand used, as shown in the cut. It is claimed that the combustion is of a character to generate a great heat and to be entirely free from smell. The company have a fine half-tone engraving of their exhibit at the World's Fair, where they are giving out a small four-page card showing a half-tone engraving of a nook in the bridal chamber at the Hotel Waldorf and one of the apartments that were occupied by the Duke de Veragua, both of which show that Rochester lamps are used for lighting. On the back of the card is a number and "Keep this card and watch the number, as it may draw the Rochester prize lamp shown at our exhibit at the close of the Columbian Exposition."

Ladies' Delight Oil Heater.

In the accompanying illustration we present a view of a new oil heater which has been placed upon the market



Ladies' Delight Oil Heater.

by Page Brothers & Co. of 227 and 233 Cambridge street, Boston, Mass. This stove, it will be observed, is of novel design and construction, and is fitted, among other things, with patent central draft burner, giving great heat and making the stove powerful in operation. The arrangement of parts is such that the oil in the tank always remains cool, and the makers state that the burner does not smoke or smell. The rods supporting the top and base, it

will be observed, are provided at their middle points with spiral wound nickel-plated wires which serve as handles, while the bail at the top permits the stove to be readily carried from place to place. The Ladies' Delight is trimmed with nickeled parts in a way to render the stove very attractive.

J. B. SHANNON & SONS of Philadelphia, hardware dealers, are again to be found at their old stand, 1020 Market street, the damage occasioned by the fire in April last having been repaired sufficiently to allow of a reopening. Since the fire their business has been conducted at 919 Market street.

WORLD'S FAIR NOTES.

The Merrell Mfg. Company

of Toledo, Ohio, make an exhibit of their pipe-cutting and threading machinery in Machinery Hall, Section 13, Columns I and J, Nos. 40 and 41. Here they have installed specimens of their Nos. 12, 9½, 6, 4, 2 and 1 machines, all of which are shown in actual operation. The machines are specially designed to meet the wants of steam and gas fitters, erectors of heating, lighting and power plants, pipe-line service and general machine shops. The No. 12 machine is the largest they manufacture, and has a range from 2½ to 8 inch pipe inclusive. It is designed for heavy service, having a quick opening and closing die head, with a convenient cam movement and improved cutting-off knife. The cones are placed centrally over the machine, thus equalizing the weight and placing the belt in the most convenient position. Within the cones are compound gears which give six changes of speed. The vise is self-centering and feeds the pipe into the chasers by a friction universal lead screw connecting the vise frame to the die head by a cam closing the lead nut on the screw. A reverse movement of the cam releases the lead nut, or the pipe can be fed into the chasers by the hand wheel. The No. 9½ machine takes from 2½ to 8 inch pipe, is so arranged that either hand or power can be used at will, or the machine can be readily taken from its base and used as a hand machine. The No. 6 machine is a portable hand threading and cutting machine with an adjustable quick opening and closing die head and an improved cutting off knife. It takes from 1 to 6 inch pipe inclusive. With it one man can cut and thread a 6-inch pipe. It is operated either by a ratchet lever or a crank. The No. 5 is a hand machine taking from 1 to 4 inch pipe inclusive. The No. 2 is a hand or power machine, with a range from 1 to 4 inch pipe, and the No. 1 is also for hand or power, but covers a range of ¼ to 2 inch pipe. These machines are specially noteworthy for their compactness, perfectly housed and journaled gears, their ability to cut true threads on uneven pipe, their great range of sizes with but one set of chasers, the convenience with which chasers can be changed for other sizes or from right to left, rapidity of cut off, and the positive feed to the chasers. The Wells Machine Works were formerly the manufacturers of these machines at Fostoria, but their business was recently purchased by the Merrell Mfg. Company.

Millers Falls Company

of Millers Falls, Mass., whose salesroom is at 93 Reade street, New York, have an exceedingly interesting exhibit in Machinery Hall, located in section 13, column I, No. 39. A showcase along the front of the space contains a variety of the small tools made by the company, such as small spirit levels, ratchet drills, Nos. 4 and 5 tool holders, hand vises, machinists' levels, four-faced spoke shaves, family tool chests, automatic drills, screw drivers, small miter boxes, small bit braces, soldering sets, &c. On a table in the rear are shown large miter boxes. Next comes a very large table, which is used for a display of vises, jack screws, drilling machines, &c. Among these vises are samples of the company's new mechanics' vise, with interchangeable jaws, a large steel-faced anvil and a seat which enables the vise to be swung round for the use of filers. Vises are also shown with side sockets to hold drills in place for operating on work held in the vise. The jack screws have ball-bearing heads, which is an excellent feature. In a large upright showcase in the extreme rear are specimens of large tools, such as butchers' saws, hack saws, scroll saws, ratchet drills, bit braces and large spirit levels. Blades for the butchers' saws are furnished so cheap that the user can afford to throw away a dull one instead of wasting time filing it sharp. The Star blade used in the hack saws have very rapidly displaced English blades in recent years, comparatively few being imported now, whereas the entire trade was in foreign hands but a few years since. The bit braces have a number of novel features, such as ball bearings in the head, anti-friction collars on the handle and a steel washer to take up the wear on the ratchet, all of which have been put on the tool without an advance in the old prices. Automatic drills are made with an assortment of drills in the handle, which is a convenience highly appreciated. A ratchet auger handle is shown, which is in high favor among bridge and car builders. It can be used as a ratchet or converted instantly into an ordinary auger handle, according to the character of the work to be done. Along the side of the space stands a row of small machines which are among the company's most popular products. In front is a power saw for sawing cold metal, which will cut a 5-inch angle bar with ease and hardly any waste of material. It can be set to work and needs no further attention, as it stops automatically on finishing the cut. It cuts perfectly square and without the use of oil. This machine is shown in operation on slotted work, cutting rails, sawing bars, &c. On light work it can be operated by a hand crane. Next comes an iron-frame grindstone, operated by a treadle, intended for use in small shops or by families. Then follow a number of specimens of foot-power lathes, each of which has a scroll-saw attachment, which can be quickly added or removed, leaving a lathe capable of quite a range of service. In interesting contrast with fine modern tools, the company exhibit a number of bit braces which were made from 100 to 50 years ago. They are constructed wholly of wood, the bit being held in its place by a wedge.

The Summit Refrigerator Mfg. Co. of Michigan City, Ind., make an exhibit of their Refrigerators in Manufactures Building, section O, block 2. The conspicuous feature of this exhibit is a solid mahogany sideboard Refrigerator which is stated to have cost $1000 It is of large size and most elaborately carved. The central panel in the top, which is usually filled with a mirror, is in this case ornamented with a fine carving which depicts the landing of Columbus. On a bracket to the left stands a carved statuette of George Washington, while on the right is the Goddess of Liberty. This refrigerator is substantially built for regular service, is fitted with the company's patent double system of air circulation, large ice chamber, cold water tank, &c. Other refrigerators shown are regular goods, embracing a number of domestic styles, finished in hard wood, antique finish, with solid bronze trimmings, and built on the double system of air circulation, for which special claims are made.

Mica in Alabama.

The Chattanooga *Tradesman* reports that the representative of a firm of dealers in sheet mica for stoves and furnaces lately arrived in Cleburne County, Alabama, where the mica deposits are situated, and his announcement that he is ready to contract for several hundred tons of first-grade cut mica has given life and impetus to the industry, which for some years past has been abandoned for lack of a ready market for the product. Imported Indian mica, which was put on the market at a low price, had taken the place of the home product to a great extent, and the mining in Alabama, and also to a great degree in North Carolina, ceased. Several miners are now said to be prospecting the mica-bearing veins in Cleburne County, east of the Tallapoosa River, and also in the extreme northern portion of Randolph County, with the double purpose of taking out merchantable mica, and also to develop the ledges, and show by sinking, cross cutting and drifting the extent and value of the different veins. Crystals which when split into sheets cut to size as large as 10 x 12 inches whithout a flaw or stain and of perfect transparency, although of rare occurrence, yet have been found and mined in this district, but as a general rule the sizes to which the first-grade mica can be cut are 2 x 4 inches, 2 x 6 inches, 4 x 6 inches. In the blocks or crystals, the wine-colored mica which, when split, shows perfectly white, quite generally occurs, but it is impossible at present to estimate the percentage of merchantable mica in the district, although it is believed to be large. There is, furthermore, a prospect that a railroad, and perhaps two, will be built before long in this section of Alabama, which will materially aid the economical development of the mica mines.

A pleasant instance of good feeling between employers and employed was shown recently at the works of the Deane Steam Pump Company, Holyoke, Mass. The works of the company have been running for some time but five days a week, and a few days ago the firm decided to further reduce the working days to three, owing to the difficulty of obtaining money to pay their men. The workmen thereupon waited on a member of the firm to signify their willingness to go on working five days at the three days' wages until better times. The firm, while refusing the offer in its entirety, allowed the men to continue the five days' work, saying to them that they would make every effort to pay them weekly for the full time.

STOVE TRADE NOTES.

The Future of the Hot-Air Furnace.

By A. W. Glessner,

President of the Excelsior Steel Furnace Company.

MISSIONARY WORK.

In all departments of work, secular as well as religious, "missionary work" is regarded as of the utmost importance, and especially is this true of the furnace business. In this country there are hundreds and thousands of buildings erected annually which should be heated by hot-air furnaces and undoubtedly would be heated by this system if the owners were interested in advance of the actual work of construction by the furnace dealer. The advantages of hot-air heat are not brought to the notice of the owner until after other contracts for chimneys, &c., are let and then he does not feel inclined to make the necessary arrangements for the introduction of the heating apparatus. The sale of furnaces in this country would be more than doubled if the dealer would do proper "missionary work," which, briefly, would consist in interviewing intending builders in the interests of furnace heating, and sowing the seed which would bear fruit later. One point in particular should be impressed upon the owner, and that is the importance of putting in the concealed pipes even if no thought is had of putting in the complete apparatus. The cost of the concealed pipe is small and if it is not deemed wise to put in also the registers and boxes the pipes and branches can be run to the proper place and then the location of the registers plainly marked, so that when ready for the furnace the holes can be cut in the floor for the registers and registers and boxes put in and the heater installed. It is not even essential that the boots be attached to the stacks as long as the ceiling of the basement or cellar is not plastered, so that the cost of what work has to be done in order to get in the concealed pipes is a small item, and in cases where an owner cannot be induced to put in the entire plant the dealer can almost always secure the contract for the concealed work. The owner saves the money he would otherwise pay out for extra chimneys and advances the selling price of his building, for it is an undeniable fact that a building into which a furnace can be readily placed without disturbing the walls will command a higher price than one not similarly situated.

THE TIME TO TALK.

While plans are being considered the owner is more receptive to facts and arguments, and then is the time to talk up the heating apparatus and not after the work of construction is under way. Owners have not only more time but are more liberal earlier in the work than later when the inevitable cost of extras stares them in the face. Therefore the furnace dealer should seek out intending builders as early as possible and work up the hot-air heating by every possible means and he will find that his efforts have not been in vain.

In the case of school houses, churches, halls and public buildings, the heating is in the hands of boards or trustees who move slowly, and the dealer first on the ground and who keeps at it early and late is the one who usually gets the plum.

(*To be continued.*)

American Stoves Abroad.

The London correspondent of the *American Exporter* writes to that journal: It has been an open secret for some time past that American manufacturers were going to try to introduce the closed stove—similar to those used in the United States—into Europe. It is said that Berlin and Vienna are the cities where the experiment is going to be tried, because climatic and other conditions are, if anything, rather more favorable than in England. Indeed, closed stoves are already in use in those cities, and there is certainly no reason why American manufacturers should not have a hand in this trade. It is, of course, well understood by American exporters that the stoves supplied to the German and Austrian markets would have to be very cheap, because the great bulk of the people are comparatively poor, and they cannot afford to pay much for their household goods.

I may say that there is no valid reason why the experiment should not be quite successful, assuming that stoves can be placed on the market at a low price. The experience of American manufacturers in introducing this line of goods into France, some 15 years ago, was very encouraging. Several consignments were made to that country, and I believe that similar stoves are now being made in France, from the patterns of those previously sent from the United States. It is estimated that about 30,000 of these stoves, made on the American pattern, have been sold in France, but of course considerably more than this number could be disposed of if the business was taken up in an energetic manner by exporters in the States.

Even Switzerland, which is one of the quietest and most conservative little countries on the face of the earth, is taking kindly to the closed stove, and a shipment of them has recently been made from an American house to a Swiss firm.

It is exceedingly difficult to say whether the experiment will succeed in England. The English people are wedded to their open fire places, and it will take a good deal of arguing to displace the prejudice against the closed stove. But this remark only applies to the better class of private houses, where the owners keep servants, and can afford to buy all sorts of appliances to minimize the inconvenience of smoky chimneys. In small houses, however, where the occupants are comparatively poor, the closed stove may be preferred on account of its economy. For heating small public buildings—such as school rooms, lecture rooms, &c.,—I think the American stove is just what is wanted. Of course they can be supplied in all sizes, to suit the purpose for which they are required. Although the open fire place may have a more cheerful appearance than the closed stove, such an advantage is more fanciful than real. Every resident in England knows that, on a cold day, a person can sit in front of a big fire in an open grate, and almost scorch his face while his back will be icy cold. Where a closed stove is used the heat is diffused all over the room, and there are no cold corners and drafts to avoid.

I may be permitted to state briefly a few of the advantages possessed by the American closed stove over the ordinary English open fire place.

ECONOMY OF COAL CONSUMPTION.

Speaking from considerable experience, I think it will be found that the closed stove consumes much less fuel to produce a given temperature. It requires very little reflection to show that this must be so. In the open grate fully 40 per cent., and in many cases 50 and 60 per cent., of the heat goes up the chimney, and is totally lost for the purpose of heating the room, and only serves to warm the streets. The draft can also be so nicely regulated in the closed stove that absolutely no coal need be wasted. When a room gets warm enough the regulator can be adjusted accordingly; whereas in the open fire place there is no alternative but to open the door or windows and let in a gust of cold, damp air. With a closed stove people can keep up just what size fire they require; whereas it is very difficult to do this with the English stoves, because a small fire is always liable to die out suddenly. There is really no proper method of regulating the draft of the open stove, and this necessarily entails a larger consumption of coal than would otherwise be requisite. The American stove is therefore cheaper on this account alone.

LESS TROUBLE.

Every English housekeeper knows the immense amount of trouble caused by the open stoves. They always want "brushing up;" and unless the cinders which fall through the bottom bars are constantly being taken up, the hearth place looks dirty and untidy. They also require a good deal of attention in the way of being supplied with fuel; nor can a fire be left in an open stove for many hours unattended without "going out." Then, again, where the American stove is used there is practically no trouble with chimneys, which do not require sweeping except on rare occasions. This, again, is a saving both of time and money.

NO SMOKY ROOMS.

It only requires residence in an English house to appreciate any system which promises to do away with a smoky room. The closed stove, however, will do this, the smoke being carried away up the chimney by a properly regulated draft. Of course, anthracite

coal is the proper fuel to use in these stoves, and is superior to other kinds of coal for this purpose. It burns much slower and gives greater warmth than any other variety. Considerable quantities of this coal are being shipped to Europe for consumption in the closed stoves, and can be purchased at just the same price as the inferior coal obtained from European mines.

Matchless Stove Works.

We are indebted to Graff & Co. of 632 and 634 Liberty street, Pittsburgh, Pa., for a copy of their annual catalogue and price-list of cook, gas, parlor and heating stoves, brick-set and portable ranges and furnaces and iron and steel ranges, grate fronts, fenders, &c. The leading place in the catalogue is given to the Grand Denver, a six-hole range with tasteful ornamentation and made with a fire box on the right or left hand side, according to requirements. It has the late improvements, including heavy castings and extra large ovens. Some of the other goods which may be noted are the Columbus, a neat durable range with sectional fire back and cut centers; the Columbia, made in three sizes, one of which has five holes and the other two six holes in the top surface; the Ellwood, a low-priced four-hole range, and the Denver, a substantial construction made in a variety of styles and sizes. The cook stoves are represented by the Western, Matchless, Iowa and Ashford, the latter being intended for burning wood only. Among the heaters we find the Matchless Oak, mounted with heavy cold-rolled sheet iron, extra deep ash pit and nickel trimmings; the Shenango, a hard coal base burner of attractive appearance; the Grafton, a neat open Franklin parlor stove having improved dumping and shaking basket grate; the Matchless, a soft coal furface burner, together with a long list of globe, cannon and laundry stoves. The closing pages of the catalogue are given up to price-lists of stove hollow ware, grates, flue rings, water shoes, &c., mantels and grate fronts, and an illustrated description of the Monarch warm-air furnace and the Matchless heater intended for soft coal, hard coal, coke or gas. A corrected list of stoves manufactured in Pittsburgh, together with directions for using the Matchless furnace, are features of the catalogue.

Safety of Oil Stoves.

We take the following from a recent issue of the *Times*, published at Portsmouth, N. H.:

"Cleanliness is next to godliness," the divine book informs us; so, too, it is an assurance of a perfectly safe oil stove. Interviews with dealers in these commodities, and especially with reference to their safety, are to this effect: As regularly as the summer season comes round, fires are reported in the newspapers as having been caused by the explosion of oil stoves. In such cases what really happens is this: A person rushes into a kitchen where there is an oil stove, notices the said stove enveloped in flames, and, catching it up, throws it bodily out of the nearest window. The stove is broken to pieces by that proceeding, but there has been no explosion; in fact, dealers say that oil stoves never explode. The trouble, they say, is that people do not take proper care of the stoves. Instead of cleaning them from time to time, as in the case of lamps, they neglect them and allow them to become clogged up with a coating of dust and oil. That mixture is very inflammable, and if it remains about the wicks it will evidently take fire.

Trade Poetry.

The fact is becoming more and more apparent as the years go by that there are among the members of the stove trade those who can write poetry with the same success that they can sell goods. An effusion appeared not long since in an issue of the Everett *Herald*, published at Everett, Mass., which we make bold to present to our readers, with title and introduction as follows:

"YOU SOUGHT THE MOUNTAIN RANGE."

One of the young men at the office of the Magee Furnace Company being away on a vacation, their poet laureate sends with a copy of Baxter's "Saint's Rest" the following plaint:

DEAR JOHN:
You sought the mountain *range*
With *rest* and *change* in view,
Now friends at home invest *their change*
And send the "*Rest*" to you.
The *latter may not* be the sort
Your *tired fancy* paints.
It ought to please, the author thought
Its good enough for *Saints*.
We know *you* for a *sinful chap*
Not one we would select
As fitted to enjoy the "snap
Cut out for *the elect*.
But funny metamorphoses
Are brought about by Fate,
As nice in operation as
Our famous "*Dock Ash Grate!*"
So you on the cool brooklet's brink
Or *Alpine* heights recline,
While *torrid d.ys* here make *us* think
"*Hot air*" our proper line—
For really quite *stove up* are we
And longing for *some ch inge;*
Till Congress aids the currency
'Tis way beyond *our range*—
A little nonsense now and then
Gives life an added zest.
But *'tis too hot*—we drop our pen—
We too must take a "*Rest.*"

BOSTON, August 10, 1893.

Covering Hot-Air Pipes.

A correspondent who has had a highly satisfactory experience in the use of asbestos as a non-conducting covering for hot-air pipes sends us the following article in praise of insulation:

Householders frequently complain through the winter of the large quantity of coal consumed in heating their dwelling, also of the overwarm condition of the cellar, which cause apples, potatoes or other supplies stored there to decay, and renders it necessary in many cases to use ice the entire year to properly keep butter, milk and other perishable food. Even with this large expenditure for fuel it is often impossible to comfortably warm the house, and occasionally the wood work ignites from the hot pipe running from the furnace to the register, and a serious conflagration results, which might have been avoided by the use of a proper non-conducting covering on the pipes. Of course the colder the weather the more forcibly these defects assert themselves, and when the wind is high and the thermometer low, many perceive to their great discomfort that their furnace or steam heater, which has been efficient in ordinary weather, does not heat the house. An examination at the heater will show a good draft, a bright, clear fire, a free consumption of coal—in short, everything in good order—and the heater, as promised by the maker, generating a large body of heat.

Where, then, is the trouble? What is the defect? Why with so much heat on hand below stairs is so little obtained upstairs? are the questions you will ask yourself. Manifestly there must be a radical defect in an apparatus that pours a large volume of heat into the cellar, where it is not wanted, and sends but a small volume of heat to the rooms above, where a large amount is wanted. To answer these questions in advance is the purpose of this article. A serious defect exists in the equipment of most heating apparatus, and very likely in yours, which can and ought to be remedied. If we told you of a leak in your roof you would repair it before the next rain. If a window pane was out you would replace it at once. We now tell you of a leak in your heating arrangements, and the prudent householder will attend to it without delay.

This leakage or waste is due to the radiation of heat from the iron or tin piping, somewhere between the furnace or heater and the register or radiator. In effect, the loss is just as serious as though holes had been drilled in the iron, and the steam or hot air was pouring through them into the cellar, and the result is a failure to deliver the heat in the rooms above at the same initial temperature as it left the heater below. This is the working of a well-known law, that metallic bodies, like tin or iron, transmit and radiate heat rapidly. The heat on the interior of the pipe is quickly conducted through the iron, and then as rapidly radiated into the air of the cellar. This is a loss to you—a loss that is going on every day the heater runs. Every heat unit that is wasted downstairs will help, if saved, to raise the temperature upstairs. Do not flatter yourself that it occurs in cold weather only. It is worse then, and more noticeable, but it is going on constantly. Every day you are burning coal that goes to heat your cellar and paying your coal dealer for goods you do not need. This loss of heat, and consequently waste of fuel, can be stopped. Heating plants that do not give proper service can be made efficient by the use of the mineral asbestos, if applied in proper form. It is clean and handy, fire proof and safe; it stops radiation, prevents loss and saves money.

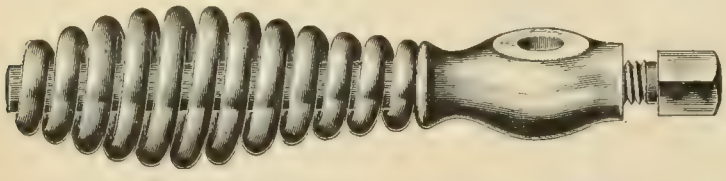
The Union Stove Works

of 70 Beekman street and 66 and 68 Gold street, New York City, are sending out a well-arranged catalogue, consisting for the most part of illustrations and descriptive text relating to patterns of stoves, ranges and heaters with which the trade are already more or less familiar. The special feature of the volume is found in an appendix in which attention is invited to the new goods for this season and to the stoves which have been improved for 1893. Among these may be mentioned the Dover B, a very attractive five hole range with swell doors, nickel name plate, patent oven-door opener and oscillating oven shelf. The makers state that this stove is not only popular in the United States but commands large sales in all foreign countries where American ranges are sold. The Glen B is another five-hole range of attractive ornamentation which has swelled doors, patent oven-door opener, oscillating oven shelf and other features which are likely to render it popular with the trade. The Bon Bon B is in all respects similar to the company's regular range made under this name, except its fancy base and legs, which add to its general appearance. Another new stove embodying the modern improvements is the Colon, made in one size for burning either coal

or wood. The design of the ornamentation on the panels and oven door is in imitation of the sun-burst, producing neat effects. Another new stove is the Palos, also made in one size and embodying the modern features. The Astor No. 70 is a six-hole range intended for flats or apartment houses, while the Astor No. 25 is a double-oven range with a duplex grate. Flirt B, Belmar, Invader, Rush and Rover are some of the heaters which are presented. The catalogue closes with a number of blank pages intended for the purpose of memoranda. The price-list for the company's goods is embodied in a 24-page pamphlet bearing date of August, 1893.

Some New Alaska Handles.

The Troy Nickel Works of Troy, N. Y., have just brought out some new patterns in the way of stove handles, general views of which are presented in the accompanying illustrations. These handles are made on the same general principles which have given to the productions of the concern a wide reputation, the coiled wire keeping the handles always cool to the touch. The general arrangement of the several parts of which the handles are composed is so clearly indicated in the engravings that extended reference to this feature is unnecessary. The handle shown in Fig. 1 may be used for a variety of purposes, but more especially in connection with gasoline stoves, while the one illustrated in Fig. 2 is intended for use on furnace doors.



Some New Alaska Handles.—Fig. 1.—Handle for Gasoline Stoves.

Fig. 2.—Handle for Furnace Doors.

The Glazier Stove Company

of Chelsea, Mich., have just issued from the press an exceedingly neat and attractive catalogue, showing their leading specialties in the way of oil and gas stoves. The little volume is printed in good style, and is bound in colored paper covers, with side title in bronze letters upon a ground work of a delicate shade of pink. The goods illustrated are made for the most part under the designation B & B, the oil heaters being provided with spun brass oil tanks, with patent automatic indicators. This device is something new, and is attracting no little attention on the part of the trade. All parts of the tank are made of brass, being drawn or spun from solid sheets after the same style as the Rochester, Pittsburgh and other large lamps. By this means the company are able to do away with nearly all soldered seams below the oil line. The patent automatic indicator shows at a glance the hight of the oil in the tank. A double-thick 15 inch circular wick is employed in connection with the B & B heater, and the makers state that it does not have to be replaced with a new one when burned off, but can be raised and gripped again, making it as good as a new wick. The wick raiser grips the wick on six sides and raises it with perfect uniformity. The No. 20 oil heater which the company are offering to the trade stands 50 inches in hight and has a base 20 inches square. It is mounted on rollers and is finished in nickel in a way to produce a very brilliant effect. The letters B & B used in connection with these goods stand for Brightest and Best. The catalogue shows also an interesting assortment of combination cook stoves and heaters, as well as constructions intended for cooking purposes only. A variety of lamp stoves, extension tops, ovens, gas stoves for heating and cooking purposes, together with miscellaneous goods, are features of the volume.

ODD PLATES.

On the cover of a red and white striped pasteboard box that came in the mail is a red label on which is a handsome young man with a similar box in his hand and the words "Roly Boly," with the following directions: "Times being such as to allow you some leisure, place the balls in their respective positions as to color, and then remember that the Alaska Trimmings are Always Cold." On raising the lid, "Compliments of Troy Nickel Works, manufacturers of Always Cold Alaska Stove Trimmings, established 1880, Troy, N. Y.," greets the eye, after noting three different colored balls with little inclosures in which they are to be corralled, providing you have the skill. This seemingly easy job is, however, a contract of immense proportions, and any ordinary enthusiasm will grow as cold as an Alaska handle before it is accomplished.

W. P. Abendroth of Abendroth Bros., New York, finds the atmosphere of Saratoga agreeable and entirely free from anything suggesting stoves, even though it has been the scene of national conventions.

The Gem City Stove Company of Dayton, Ohio, resumed operations in their works the early part of the week after a brief shut down. During the time that operations were suspended the company made some changes, among them being the addition of a new 20-ton cupola. Their goods are meeting with a gratifying demand and a large fall trade is expected.

The Electric Oil Stove Company of Homer, Mich., favor us with circulars of the Electric oil heater and the Electric oil range, the latter having been improved for 1893. The heater has oil tank, water reservoir, burner, wick tube, &c., made of rolled sheet brass, while the flame deflector is cast iron and will not, it is claimed, burn out. The wick raiser in combination with the rewicking attachment is referred to by the company as simplicity itself, while being strong and positive in its action. An ornamental drop mica door gives access to the burner for lighting without tipping back the upper part of the stove. The capacity of the oil tank is 1 gallon, its location being such that the cold air passes entirely around it, thus keeping the oil cool. The castings are highly polished and nickeled, producing a brilliant effect.

The Security Gas & Vapor Stove Company, St. Louis, Mo., made an assignment recently for the benefit of their creditors. The assets of this concern are more than sufficient to cover their liabilities, but inability to raise money on what they considered good securities forced them to make an assignment. They expect to make arrangements with their creditors in the course of a few days, and it is expected that the business will be continued as heretofore.

The work of fitting up the machinery and other appliances at the plant of Foster Brothers, proprietors of the Central Stove Works, Lebanon, Pa., is being pushed forward with great rapidity, and it is expected that the production of stoves will soon commence.

The Tuttle & Bailey Mfg. Company, 83 Beekman street, New York, issue a circular letter to their Western customers and friends, announcing the opening of a branch store at 136 Lake street, Chicago, where they keep a large stock of registers, ventilators, &c., of all sorts and finishes. They also refer to their sample goods on exhibition at the World's Fair, located in the Manufactures Building, Section O, Block 3, Post 69, where they have many new designs and finishes in bronze, nickel, silver and gold plated and other styles.

One of the latest blanks issued by the Excelsior Steel Furnace Company, Chicago, Ill., is for the use of customers in taking measurements on jobs of hot-air pipes, dampers, elbows and casing collars. It is pointed out that usually these measurements are taken by the workman on scraps of paper and leaves torn from memorandum books, and, on account of this utter lack of system, there is constant liability to error. With the blanks, however, issued by the Excelsior Steel Furnace Company the information is furnished in an orderly way and affords a permanent record of the fittings needed, that can easily be transmitted to

an order blank when the job is ready for piping. The blank is a sheet 11¼ x 9 inches in size, each side being divided into three spaces, reading as follows: "22½-degree angles IC, IX; Dampers, hot air; Casing collars, top straight side. Pitch 75 degrees to 60 degrees." On the other side of the sheet the divisions are headed: "Hot-air pipe IC, IX; Elbows 3 pc., 4 pc. IC, IX; 45-degree angles IC, IX." Each of these main divisions is divided into 12 columns, headed with inches from 7 to 30, so that the proper number of elbows, pipe, &c., of the different diameters can be inserted. The company have sent these blanks to a number of dealers, and they learn that they have been of great assistance in avoiding errors.

ADVICES from Detroit are to the effect that on the morning of Monday, August 21, operations were resumed at the works of the Michigan Stove Company, a full force being employed.

A. R. SALLE, until recently general agent of the Milwaukee Gas Stove Company, in charge of the Chicago store at 128 Michigan avenue, has succeeded Mr. Detwiler as general manager at Milwaukee. Mr. Salle leaves the management of the Chicago office in the hands of H. J. Forsyth, who needs no introduction to the stove trade. One of the new things the company are placing upon the market this season is the Perfection fire place, which has to be seen to be fully appreciated. It has many merits, one being that it throws all the heat out into the room instead of allowing part of it to pass up the chimney. It cannot blister the mantel, and owing to its construction is absolutely odorless.

THE STOVE TRADE, plumbing trade, tinners' trade and all of the kindred trades on Beekman street are positively suffering from an inability to fill orders. In the present condition of affairs generally this street seems to be a notable exception and would be open to congratulation if it were not for the cause. For some weeks the street has been turned over by the city to a band of noble American workingmen who speak all of the known tongues except Americanized English. The sidewalks are covered with granite blocks, so that the merchants can only with difficulty get to their stores and only such goods as can be carried to a cross street, to be loaded on trucks, can be shipped. The middle of the street is truly a desert, as sand predominates, though street cars run down the center—when they do not run off the track, or are permitted to by the present rulers. These merchants are entitled to better treatment by the city officials, who should complete the paving work with reasonable dispatch.

THE MICHIGAN STOVE COMPANY favor us with a sample of the paper glass sign which they are now distributing. It consists of the Garland trade-mark printed in colors on a transparent paper which will adhere to a window pane, its transparency causing it to present a brilliant appearance when viewed from either side.

THE CHICAGO daily papers are justly sounding the praises of Miss Florence Hawkins, daughter of Frederick Hawkins, the manager of the Fuller Warren Company's Chicago branch. Miss Hawkins risked her life on the 24th ult., at Lake Geneva, Wis., endeavoring to save a lady companion who was beyond her depth and could not swim. They were bathing at the time. The sinking lady, however, clutched Miss Hawkins with such a grip that both would have been drowned but for the timely assistance of two gentlemen, Stanley and Arthur Midgley, who saw them struggling, jumped in to their relief and rescued both of them.

E. BEMENT & SONS of Lansing, Mich., talk in a different strain from stove manufacturers generally. They announce publicly that they are running full force in every department of their enlarged and improved plant. They have not shut down a single day and are in a better position than ever to give their customers good service and first-class goods. This is one of the most cheerful statements concerning the condition of the stove trade that we have recently heard, and we hope that they may have no reason to modify it as the season advances. The situation generally seems to be really brighter, however, and we shall be greatly disappointed if the stove trade does not improve very considerably before the advent of cold weather.

THE NORTH DIGHTON CO-OPERATIVE STOVE COMPANY, North Dighton, Mass., have issued another attractive poster, lithographed in colors, advertising their Oak Grand, Live Oak and Prize Oak ranges. The design of this poster consists of a striking illustration of the "Summer Girl" in the mountains. The colors of the design are harmoniously blended, and the effect is pleasing.

THOMAS MORAN has recently established himself in the business of manufacturing stove castings at Bradford, Pa. We understand that he has the patterns from which to make all sorts of repairs for 60 different kinds of stoves. Mr. Moran was for many years connected with the Co-operative Foundry Company of Rochester, N. Y.

THE ART STOVE COMPANY, Detroit, Mich., have just completed the last size of their new base parlor heating stove known as the Laurel. It is made direct draft and full revertible flue, the latter being so constructed that the entire products of combustion are carried to the outer edges of the base of the stove, resulting in a great economy of fuel. This line has met a very gratifying reception at the hands of the trade, and the manufacturers are distributing a neat circular illustrating and describing the two forms in which it is made. The company state that they are running their works all summer and that their cancellations are not above those of last year.

THE FAVORITE STOVE & RANGE COMPANY of Piqua, Ohio, mailed to their customers under date of August 28 a circular letter stating that the company have been running their extensive works full capacity thus far the present year and expect to continue doing so in the future. They state that shipments up to the present time are largely in excess of those for the corresponding period of last year. During the past summer the company have added to their extensive plant several new buildings, two large boilers, a 200 horse-power Hamilton Corliss engine and considerable new machinery, largely increasing their capacity and enabling them to handle their orders with greater dispatch than ever before. The circular letter also states that the company are constantly adding new patterns and expect to bring out new goods according to the requirements of the trade. The company expect a scarcity of stoves this fall, for the reason that the production per week is estimated at over 50,000 stoves less than a year ago at this time.

Sealed proposals will be received at the office of the Supervising Architect, Washington, until September 19 for the stone and wood work, iron and wood floor, ceiling, roof construction and roof covering for the United States Building at Aurora, Ill. Drawings and specifications can be obtained from the Supervising Architect at Washington or from the superintendent at Aurora.

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TRADE REPORT.

The Iron Market.

There seems to be quite a general determination to take a brighter view of the situation. That in itself is a very good beginning, but it is likely to cause a reaction, unless there is an early appearance of convincing evidence in its support. Such evidence is not wanting, but it must be frankly confessed that it is not as yet very impressive. It is not fair to expect it. Recovery is bound to be disappointingly slow to the sanguine, while entirely satisfactory to those who look forward to an expansion of consumption by small increments rather than by sudden calls for large quantities.

The fact that quite a number of mills are starting up is in itself evidence that there has been some accumulation of orders and considerable clearing up of stocks. The fact is noted, too, that inquiries are beginning to come in and that there are occasional indications of a speculative interest, though it is still very timid.

The most encouraging news thus far comes from those departments of the trade in which the bulk of the product reaches consumers in relatively small quantities, and where, therefore, jobbers and merchants are a more important factor.

That part of our industries which relies upon the railroads as purchasers is still suffering from an unprecedented lack of orders. In engineering work and in the architectural branches there is a somewhat better demand, but as yet it has not reached even a modest volume, while the future is clouded by the fact that the building season has only a few more active months.

Pig Iron.—The New York market is still exceedingly dull. Locally some of the largest consumers still decline to take shipments and are melting very little Iron. Tempting offers are still being made for cash. We quote Northern brands $14 @ $15 for No. 1; $13 @ $14.25 for No. 2, at tidewater. Southern Iron, same delivery, $13.25 @ $14.25 for No. 1; $12.25 @ $13.25 for No. 2; $11.50 @ $12.25 for No. 3; $11.75 @ $12.25 for No. 2 Soft, and $12.25 @ $13 for No. 1 Soft.

In the Philadelphia market the demand is chiefly for small lots, which, as a rule, are taken at quoted rates. Large lots are not inquired for to any extent, so that the only way of realizing on such is to make an extremely low quotation, so low, in fact, that no holder would make it unless under great financial stress. The expectation is, however, that the demand will soon begin to show improvement, but in any event prices are not likely to go lower. General quotations are about the same as last week. Small lots command pretty close to asking prices, but for spot cash, or under conditions specially favorable to the seller, 25¢ to 50¢ less would not be considered extreme concessions. Ordinary time sales are usually at about $12.50 @ $13, delivered, for Plain No. 2, $13.75 @ $14.25 for No. 2x and $14.50 @ $15 for No. 1x.

Outside of an occasional sale, involving 100 or perhaps 200 tons, there is nothing doing in Pig Iron in the Pittsburgh district. There is still considerably more being made than is being consumed. The demand for Foundry and Mill Irons is very light, the movement being but nominal. Prices show no decided change, quotations being as follows :

No. 1 Foundry	13.00 @	$13.25	cash
No. 2 Foundry	12.00 @	12.25	"
Charcoal Foundry No. 1	15.00 @	16 00	"
Charcoal Foundry No. 2	14.00 @	15.00	"

Reports from Chicago show that there is very little doing in Southern Coke. Large companies, however, are standing firmly on the prices given their agents here and are turning orders down rather than make a further cut. Local Coke is in no better demand, but collections are remarkably good considering financial conditions. Inquiries noted for the past two or three weeks are not developing much business, as the people making them are either looking for bargains or else simply inquiring to keep posted on the course of prices. The Malleable Casting syndicate appear to have picked up enough odd lots to satisfy immediate requirements and are not negotiating for anything further in Lake Superior Charcoal, and the expected heavy purchases have faded from the vision of sellers. Quotations are as follows, subject to concessions for prompt cash and immediate shipments:

Lake Superior Charcoal	$16.00 @	$16.25
Local Coke Foundry, No. 1	13.50 @	14.00
Local Coke Foundry, No. 2	12.75 @	13.00
Local Coke Foundry, No. 3	12.50 @	12.75
Local Scotch	14.00 @	15.00
Ohio Strong Softeners	15.75 @	16.25
Southern Silvery, No. 1	@	14.50
Southern Silvery, No. 2	@	14.00
Southern Coke, No. 2	12.60 @	12.85
Southern Coke, No. 3	12 10 @	12.25
Southern, No. 1, Soft	12.60 @	12.85
Southern, No. 2, Soft	12.00 @	12.25
Tennessee Charcoal, No. 1	16.00 @	16.50
Alabama Car Wheel	@	18.85
Hocking Valley, No. 1	15 25 @	15.50
Jackson County Silvery	16.50 @	17.00

In local Southern markets there is little more than a carload demand for Pig Iron, which is freely supplied at previous quotations, but there have been large orders from the East which have kept the market from stagnation. An inquiry for a considerable quantity of No. 2 and No. 3 Foundry, while it did not lead to any business, developed the fact that these Irons could be bought for spot cash much under the quotations, showing that there are some needy furnaces that would sell Pig Iron for less than the cost to manufacturers. While quotations cover most of the business done, they do not represent the lowest prices for which Pig Iron might be bought for prompt delivery and spot cash, when the price would depend upon the urgent necessity of the sellers and might not be repeated. It is believed that the market is rapidly working into a condition that will bring around a more satisfactory state of trade. Quotations are given as follows :

Foundry.

Southern Coke, No. 1	$12.75 @	$13.00
Southern Coke, No. 2	10.75 @	11.00
Southern Coke No. 3	10.25 @	10.50
Ohio Soft Stone Coal, No. 1	15.50 @	16.00
Ohio Soft Stone Coal, No. 2	14.50 @	14.75
Lake Superior Coke No. 1	15.00 @	15.25
Lake Superior Coke No. 2	14.00 @	14.25
Hanging Rock Charcoal, No. 1	18.50 @	19.00
Hanging Rock Charcoal, No. 2	17.50 @	18.00
Tennessee Charcoal, No. 1	14.00 @	14.25
Tennessee Charcoal, No. 2	13.00 @	13.25

Car Wheel and Malleable Irons.

Standard Southern Car Wheel	17.75 @	18.00
Lake Superior Car Wheel and Malleable	17.00 @	17.25

Metal Market.

Pig Tin.—There has been an advance of about ¼¢ ℔ lb in Straits Tin for prompt delivery. A week ago there were sales at 18.75¢, while business was effected this week at 19.25¢. Sales and resales of contracts during the interval involve about 650 tons, and it was intimated in some quarters that half as much more stock was turned privately, chiefly for September delivery. Operations in the later deliveries have been very moderate, but prices for these as well as for early deliveries have improved decidedly. Closing of old contracts has figured with some prominence and nicely timed manipulation has been effective in helping prices upward, but gradual reduction of surplus supplies is beginning to count as a factor, and some turn of sentiment has been brought about by strong circumstantial evidence that the greater portion of available supply is in the hands of dealers who have financial matters so adjusted that carrying Tin at present is a pleasure rather than a burden, since spot supplies are being reduced in no uncertain way, or, say, at the rate of close on to 1500 tons a month. The market closed firm on Thursday at 19.40¢ for September, 19.70¢ for October, and 19 80¢

November. The consumptive demand meanwhile continues comparatively light, at unchanged prices for small lots, namely 21½¢ ℔ lb for Banca Pigs and 21¢ for Straits.

Copper.—It is estimated that exporters have purchased upward of 5,000,000 lb of Ingot during the past fortnight, and facts are brought out that would warrant the statement that the estimate is a modest one. The movement included Lake Superior Ingot, Electrolytic and even casting stock. No particulars as to the proportion of the respective varieties taken by shippers were divulged, but the movement seems to have been sufficient to arrest the previous downward tendency of prices. The buying for home account has not improved to any great extent, nor does the demand show much spirit. Still, some offers were made indicating that none but small lots of Lake Superior Ingot, if, indeed, any, can now be secured at 9½¢ for prompt or near future delivery. In this connection it may be noted that 9⅝¢, regular terms, was bid for over 250,000 lb in the face of offers of contracts on the Metal Exchange at 9.50¢ @ 9.60¢. Prices for small lots of Ingot Copper are unchanged. The retail demand is reported by jobbers as showing more encouraging features. Orders and inquiries are both better than last week, both in number and size, and the outlook is regarded as more encouraging.

Sheet Copper.—A fair demand exists for this material as compared with that which has prevailed for many weeks. Prices are inclined to stiffen at the bottom figures quoted last week, attributable possibly to the removal, by failure, of one of the largest manufacturing firms in the trade, who were said to have been making large concessions to get business.

Pig Lead.—Two weeks ago the price of common domestic Pig Lead was down to 3.30¢. A week later the price was up to 3.45¢. Since then there has been an advance to 3.70¢ @ 3.75¢, and there appears to be less Lead on sale at 3.75¢ at the present time than there was at 3.30¢ a fortnight ago. To all accounts not over 500 tons have been sold in this market during the past week, and the appearances are that the effect of the diversion of Mexican Silver Lead Ores to Europe and liberal shipments thence of Pig Lead smelted from Mexican Ores, along with light American production, leave home consumers at some disadvantage, for the time being at least. Certain it is that the stock on the spot is unusually light, and that Western smelters still hesitate about selling lots of over 50 tons at present prices. The retail demand is dull, at unchanged prices—namely, 4¢ ℔ lb for American Pig and 4½¢ for Bar Lead.

Lead Pipe and Sheets.—Since the middle of the month a decided falling off has taken place in the demand for Sheet Lead and plumbers' supplies, owing to the check in many building operations. Contractors for such buildings as are now well advanced or completing have already purchased the materials required, and few new undertakings have been begun. The outlook is not regarded as promising by dealers, in view of the rapid advance in price of Pig Lead.

Spelter.—This is the weakest spot in the Metal market. Ordinary brands of Western Spelter have been sold at 3.55¢ @ 3.60¢ for prompt and near future shipments. Choice brands brought 3.95¢ @ 4¢, delivered to New England points. Dealings in the several grades have been on a very moderate scale, and the demand at present is slow owing to the stagnant condition of Galvanizing and Brass manufacturing industries.

Tin Plates.—The market shows signs of betterment in one or two directions, although little or nothing has been noted in the way of inquiries for round lots or future deliveries. A fair spot demand is, however, observable for Cokes for canners' use in the Western, Middle and Southern States, where the corn, tomato and fruit crops are now ready for packing; the purchase of material having evidently been postponed to the last moment. The truth of the adage about being an ill wind which blows nobody any good has been experienced by dealers in Roofing Plates, who have for the past day or two been benefited by the results of the great storms which have worked such havoc in the South. Telegraphic orders have been received in New York by several houses for immediate shipments of Ternes to Charleston, Savannah, and other Southern points, where the damage to roofing has been extremely severe. The demand for Terne Plates from the stricken districts is expected to be a heavy one for some time to come. A fair retail consumptive demand for domestic Roofing Plates, showing marked improvement over the past few weeks, is reported by jobbers. The public satisfaction at the action of Congress in regard to silver legislation is thought to be reflected in a better feeling among consumers, who, however, do not yet show much tendency to purchase more stock than they need for immediate use. Prices are fairly steady at the former rates, although concessions on good-sized orders are not hard to get.

A London cable despatch of August 30, to *The Iron Age* reports:

Tin Plate market is still somewhat irregular, but anticipated early termination of the coal strike in Wales is bringing more inquiry. With holders willing to unload, a very good business has been done. Several lots of full weight high grade Cokes were sold at 11/6, f.o.b. Liverpool. Buyers have, however, since reduced their limits. American business generally is limited. For Russian account scarcely anything is moving. Over 20 works are now idle, owing to scarcity of Bars and lack of fuel. Stocks at shipping ports, 241,000 boxes, against 236,000 boxes a week ago. Liverpool prices are as follows:

IC Charcoal, Alloway grade	12/9 @ 13/3
IC Bessemer Steel, Coke finish	11/6 @ 11/9
IC Siemens " " "	11/9 @ 12/
IC Coke, B V. grade, 14 x 20	@ 11/6
Charcoal Terne, Dean grade	@ 11/6

The *Iron and Steel Trades Journal* of London stated recently that, owing to the stoppage of many Welsh Tin-Plate works for want of coal, those manufacturers who are able to continue operations have taken advantage of this circumstance to ask for higher prices. In the present demoralized state of trade, however, it has been found impossible to get better prices just now. Quotations are nominal, and any business concluded is based upon the best arrangement that can be made.

Sheet Iron.—The market for Black Sheets is unchanged in its dullness. Prices are weak, and inquiries and orders few and far between. Galvanized Iron, on the other hand, is strong and is said to be becoming scarce, consequently prices have stiffened and talk is still had of an advance, but some of the idle mills are reported to be getting ready for starting up again, and this circumstance, combined with the low price of Spelter, which enables the galvanizing to be done at a less cost than ever before, would probably prevent any permanent rise in prices for Galvanized Sheets.

Chicago Report.

Scrap.—The slack demand has caused dealers to lower their buying prices again, and they now make the following list:

	Per net ton.	Per lb
No. 1 Wrought Scrap	$7.00	....
Machinery Cast	6.00	....
Malleable Cast	5.00	....
Stove Plate (free of burnt)	4.00	....
Burnt Iron and Grate Bars	3.50	....
Sheet Iron and Hoops	2.00	....
Plow Steel and Breaking Stock	5.00	....
No. 2, such as Shovels, Hoes, &c	4.00	....
Old Boilers—whole (Iron)	4.00	....
" (Iron)—cut in single Sheets and Rings	6.00	....
Old Gas-Pipe and Boiler Tubes	5.00	....
Cast Borings	3.00	..
Turnings	4.00	...
Horseshoes	8.00	....
Copper Bottoms	....	5 ¢
Copper Clips and Heavy	....	6 ¢
Heavy Brass	....	5½¢
Light Brass	....	3½¢
Pipe Lead	....	2 1-10¢
Tea Lead	....	2 ¢
Zinc	....	2 ¢
Rubber	....	2 ¢

Anthracite.—Trade has at last begun to move, and dealers report considerable business in progress. Carload lots of 12 net tons or over are quoted as follows:

	Grate.	Egg, Sto. and Ch.
Chicago, Ill	$5.85	$6.10
Milwaukee, Wis	5.85	6.10
Kansas City, Mo	9.05	9.30
Council Bluffs, Iowa	9.05	9.30
Lincoln, Neb	9.20	9.45
Sioux City, Iowa	9.05	9.30
Aberdeen, S. Dak	9.10	9.35

Dubuque, Iowa	7.15	7.40
Madison, Wis	7.35	7.60
St. Paul, Minn	8.35	8.60
Burlington, Iowa	7.35	7.60
Des Moines, Iowa	8.80	9.05
Davenport, Iowa	7.15	7.40
St. Joseph, Mo	9.05	9.30
Leavenworth, Kan	9.05	9.30
Omaha, Neb	9.05	9.30

Colorado Anthracite.

COLORADO FUEL & IRON COMPANY.

Denver	$8.00
Pueblo	8.00
Colorado Springs	8.00
Leadville	8.00
Cheyenne, Wyo	10.00
All points between Denver and Missouri River	9.35

CONDITION OF THE

Hardware Trade.

IT IS PLEASANT to note indications of improvement in business which, although slight, are encouraging as to the future course of trade. Some increase in the demand from retailers and jobbers is reported, and travelers are sending in more frequent orders and for somewhat larger quantities. These orders are, however, for the most part small and for the most part cover only the immediate requirements of the purchasers. Reports from some Western points are also gratifying, as indicating a perceptible improvement. The assurance of the early repeal of the Sherman bill, and the accompanying improvement in the financial situation are noted with especial satisfaction, and it is hoped that there will be a gradual if not a prompt return of confidence and prosperity. The manufacturers of Hardware are for the most part in operation, but are running their works on short time. The conservative policy pursued has prevented the accumulation of the usual stocks of goods, and in many lines if an animated demand should set in there would soon be difficulty in executing orders. In other lines, however, stocks are ample. Collections are referred to as fair in view of existing conditions, and there is less complaint on this score than for some time past. The financial strength shown by the Hardware trade throughthe country is a matter of congratulation.

Advices from Chicago.—The Shelf Hardware trade in this city has improved considerably. Orders are now coming in for Sheet Iron, Stove Boards, Stove Pipe, Elbows and other cold-weather goods which must soon be supplied to the consumers in the Northwest. A considerable trade in corn crop specialties is also doing, such as Corn Knives, Baskets, Scoop Shovels, &c. The buying is not in large quantities, but the movement is, nevertheless, encouraging, as orders are getting more numerous. The demand for Builders' Hardware is only moderate and not to be compared with what it would have been under ordinary conditions. Reports from Milwaukee are even more encouraging than from the Hardware trade in this city. The Milwaukee jobbers say that their collections are greatly improved of late and their orders are very much better, so that they are not inclined to complain of the business they are now doing. It is hoped that the failure of George C. Cribb, which occurred there on Monday, will not seriously interfere with the better feeling which has developed so rapidly of late. Mr. Cribb's failure is an important one, as his assets are placed at $800,000 and his liabilities between $600,000 and $700,000. He was an extensive dealer in Agricultural Implements, wagons and carriages. Manufacturers of Hardware specialties have not yet begun to feel much benefit from the encouraging outlook in the trade. It is too early for this to occur. It is something new to be told by jobbers that they can ship goods on consignment, and that they will be sold if possible, but this has been the experience of more than one manufacturer of late when soliciting orders. Brass and Copper goods are moving very slowly, and there is not much doing in Tin Plate. Orders in these lines are confined closely to the pressing wants of consumers. A notable feature of the trade is the very heavy demand for Bale Ties for baling hay, evidently caused by the large exports. The trade in Heavy Hardware is not in quite as good condition as Shelf Hardware. This is owing to small demand from manufacturing consumers, whose factories have been quite generally shut down to await an improvement in the financial situation.

Notes on Prices.

Wire Nails.—The slight improvement which has characterized the market for the past week or two still continues, with some increase in the demand. The mills which have been closed so generally during July and August are beginning to resume operations. The shut down has prevented any accumulation of goods in their hands, and stocks are broken, the trade finding difficulty in obtaining complete assortments. The negotiations with reference to an agreement for the control of production and prices have not yet been consummated, but it is understood that they are progressing favorably. The manufacturers in the meantime are holding quite strictly to $1.50 for carload lots, f.o.b. mill, and are not making special efforts to secure business. If they succeed in completing the proposed agreement among themselves it is probable that there will be a slight advance in prices, and this fact is probably having some influence with the trade in stimulating business. Small lots from store in New York are held at $1.65.

Advices from Chicago.—The inquiry for Wire Nails is considerably better, but the situation with regard to prices is not entirely satisfactory. Some mills report that jobbers are placing orders for early delivery, while others complain that they are finding interference with their natural trade from a heavy buyer who evidently stocked up at the late low prices. Quotations on factory lots range from $1.53 to $1.60, Chicago, according to the condition of the manufacturing company. Those who are starting up their factories are experiencing trouble in getting Rods, as so many Rod mills have been shut down and stocks of Rods at makers mills and in consumers' hands are quite light. Jobbers report a good trade in Wire Nails, which is probably due to some extent to the long-talked-of advance in price that now seems to be imminent. They continue to sell small lots at $1.55 from stock, but will shortly make an effort to advance this rate to $1.60. They state that manufacturers are slower than ever in shipping some sizes, showing that stocks are badly broken.

Cut Nails.—Business in Cut Nails is moderate, the trade limiting their purchases to early requirements. The market is, however, steady in price, the mills refraining from making special inducements to secure orders. Quotations are on a basis of $1.05 for carload lots at mill, concessions being made only in special cases and particularly where the average is unusually attractive.

Advices from Chicago.—Some Wireers report a fair business in Cut Steel Nails and excellent prospects for an enlarged trade. Inquiries have been numerous of late and stocks are found to be so low in dealers' hands that an early movement must soon come. They continue to quote factory lots at $1.20 to $1.25. Small lots from stock are selling at $1.30.

Barb Wire.—This market continues sluggish, with a light demand. There are, however, indications of slight improvement in this regard. Quotations remain on a basis of $2.45 to $2.50 for carload lots at mill for Four-Point Galvanized, but in some exceptional cases this figure is slightly shaded.

Advices from Chicago.—Inquries are is steadily improving. The fall trade may not be so large as usual, but prospects are much better than they have been, and at least a fair volume of business is expected. The manufacturers of high-grade Barb Wire are not all making low prices and claim that they find it unnecessary to do so. Quotations range from $2.45 to $2.60 on Galvanized, according to the size of the order.

Cordage.— During the past week there have been no important developments in the Cordage market. The demand is only moderate and prices are maintained on a basis of 8 cents for Manila, 6½ cents for Sisal and 6¼ cents for New Zealand in large lots at factory or New York. On smaller parcels such as are purchased by the trade generally the usual advances are made. During the present month many rumors have been current in regard to Cordage in-

terests and efforts which have been made to come to some agreement in regard to prices. Many of these rumors are entirely without foundation. The fact is that the product of the plants operated by the National Cordage Company is marketed by the receivers, and at prices which are substantially the same as those made by the independent and outside companies. The report referred to in a recent issue that the National Cordage Company had made an arrangement with John Good to restore prices to a basis that would give a difference of 4 cents per pound between the raw material and the finished product turns out to be unfounded. Such a difference is obviously excessive, and an attempt to establish prices on any such basis would unquestionably result in the encouragement of formidable independent competition.

Self-Heating Washer.—This article was described in a recent issue. It is put on the market by the Self-Heating Washing Machine Company, Evansville, Ind., and is sold to the trade at $7.50 each, terms 60 days net or 2 per cent. off in 10 days.

Gas and Pipe Pliers.—Barnard's Gas and Pipe Pliers, illustrated in this issue, are manufactured by the Wm. Schollhorn Company, New Haven, Conn., for whom Julius Berbecker & Co., 65 Duane street, New York, are agents. The Pliers are sold at the following list, subject to a discount of 35 per cent. in small quantities, and 40 per cent. discount in gross lots:

4½	5	7 inch.
$8.50	9.50	12 per doz.

Old Rubber.—No new development of business has yet appeared in the market for this material, which continues very dull. The following quotations are approximate for New York delivery :

Car Springs, ton lots, ℔ lb.	....	@	$0.03¼
Rubber Shoes, carloads, delivered at factory, ℔ lb..	....	@	.03
Rubber shoes, less than carloads	2¼	@	.03⅛
Large Hose, ℔ ton	....	@	9.00
White Wringer Rolls, ℔ lb.	....	@	.04¼
White Syringes, ℔ lb.	....	@	.05

Old Rags, Paper, &c.—Only a moderate business is reported. Prices remain at about the following figures, delivered in New York :

No. 1 White Rags ℔ lb	3½	@	3¾¢
No. 2 White Rags ℔ lb			1¾¢
Mixed Rags ℔ lb			1 ¢
Blues and 3ds ℔ lb			1 ¢
Hard Sized White Shavings ℔ lb			2½¢
No. 1 White Book Shavings ℔ lb	2½	@	2¼¢
No. 2 White Book Shavings ℔ lb			1¼¢
Light Book Shavings ℔ lb			¾¢
No. 1 Mixed Shavings ℔ lb			1¢
No. 2 Mixed Shavings ℔ lb			½¢
No. 1 Printed Books ℔ lb	1	@	1¼¢
Ordinary Mixed Books ℔ lb	½	@	¾¢
Newspapers ℔ lb			½¢
No. 1 Manila Paper ℔ lb	1	@	1⅛¢
No. 2 Manila Paper ℔ lb	⅝	@	¾¢
Bogus Paper ℔ lb	⅝	@	¾¢
Common Paper ℔ lb	¾	@	½¢
Straw Chips ℔ lb	½	@	⅝¢
Binders' Clippings ℔ lb	½	@	⅝¢
Jute Butts ℔ lb			1 1-10¢
No. 1 Jute Bagging ℔ lb			1¼¢
Mixed Bagging ℔ lb	¾	@	1 ¢
No. 2 Bagging ℔ lb	½	@	¾¢
Hemp Twine ℔ lb			2¼¢
Manila Rope ℔ lb			2½¢
Jute Rope ℔ lb	1½	@	1¾¢
Mixed Rope ℔ lb	¾	@	⅞¢

Old Metals.—Prices for Old Metals are irregular and can only be quoted approximately. The demand, however, has improved. Mills which have been out of the market for some time are looking for old Scrap Iron, and picking up what they can get at bottom prices. The following are about the prices now ruling in New York :

Heavy Copper ℔ lb		8¾¢
Light and Tinned Copper ℔ lb		7½¢
Heavy Brass ℔ lb		6¢
Light Brass ℔ lb		5¢
Lead ℔ lb		3¢
Tea Lead ℔ lb		2¾¢
Zinc ℔ lb		2¾¢
No. 1 Pewter ℔ lb		14¢
No. 2 Pewter ℔ lb		7¢
Wrought Scrap Iron ℔ gross ton	$12.00 @	$14.00
Heavy Cast Scrap ℔ gross ton,		8.50
Stove Plate Scrap ℔ gross ton,		5.50
Burnt Iron (delivered at mill) ℔ gross ton		6.75

Trade Notes.

THE DODGE MFG. COMPANY, Mishawaka, Ind., issue a souvenir pamphlet of the World's Columbian Exposition. The publication, of oblong shape, is prettily gotten up, being bound in tinted paper and the letterpress is in brown ink. The illustrations begin with views of the works of the company in 1878, 1882 and 1893, which show the evolution from a small two-story square wooden building to an enormous factory plant covering four sides of a square. The illustrations that follow show wood split Pulleys in all sorts of forms, Pillow Blocks, Shafting, Clutch Pulleys, Belt Tighteners and other goods, the articles being described in the text. These souvenir pamphlets will be distributed on application.

UNDER the head of Special Notices a large furnace manufactory doing business in the West offers its business for sale. They very pointedly state that they do not sell because of "poor health," a "desire to retire," or any other fakish reason. They claim they have no old stock, bad debts or embarrassing circumstances, and state the business can be had at a bargain.

THE WESTERN BRASS MFG. COMPANY, St. Louis, Mo., whose plant was recently greatly damaged by fire, announce to the trade that they are still in shape to fill all orders promptly. They have provided themselves with a temporary office at 606 Market street, St. Louis.

THE FORMATION of a Canadian corporation whose operations will cover a wide range of business is thus announcd by the Montreal *Gazette*: "Letters patent of Canada have been issued incorporating William Clendinneng, founder; William Clendinneng, Jr., founder; Erastus William Wilson, accountant; Frank Brown, agent, and Ulric Beaupre, founder, of Montreal, for the purposes of manufacturing and dealing in Pipes of all kinds, Fittings, Castings of all kinds, Boilers, Steam Fittings, Plumbers' Fittings, Elevators, Stoves, Ranges, Furnaces and Fittings of all kinds, Cooking and Heating Utensils of all kinds, Building Metal and Wood Works, Stable Fittings, Wooden and Metal Household Furniture, Machinery and Machine Fittings of all kinds, Wooden and Agricultural Implements, the operations of the said company to be carried on throughout the Dominion of Canada by the name of the William Clendinneng & Son Company (Limited), with a capital stock of $500,000."

JENKINS BROS. of 71 John street, New York, recently received a letter from a customer in Brazil, who said that he had found the Globe, Gate and Angle Valves used by him were higher in quality than claimed by the makers. He had used the Standard Packing, also furnished by Jenkins Bros., in packing the joint in a steam dome which had always given much trouble. This Packing worked perfectly, and the correspondent thought it "worth its weight in gold."

THE SALEM MINERAL WOOL COMPANY have been chartered by John A. Bartlett of Roanoke, Va., and others, to build and operate a mineral wool plant at Salem, Va.

THE MCCULLOUGH IRON COMPANY'S plant at North East, Md., was put into entire operation this week, with 300 men, after a short spell of only partial work.

FERRACUTE MACHINE COMPANY, Bridgeton, N. J., have reduced the wages of their employees 10 per cent. on account of the depression of business.

THE FACTORY of the Lalance & Grosjean Mfg. Company, at Woodhaven, L. I., was started up again this week after a briefer shut down than was anticipated. The establishment will be run on half time for the present.

CLEVELAND ROLLING MILL COMPANY have started up about one-half of their plant, and it is stated that they will soon be giving steady employment to fully 3000 men.

GRISWOLD MFG. COMPANY'S factory, at Erie, Pa., has been running right along with plenty of orders. A part of the machine shop and molding room were shut down for a few days in order to make some alterations in fittings, which gave rise to an unfounded report that the entire establishment had suspended operations.

THE PHELPS METAL COMPANY of Syracuse, N. Y., are a new corporation which has been chartered at Albany for the manufacture of Cutlery, Hollow Ware and specialties, with a capital of $50,000. The directors are E. E. Phelps, Chas. S. Roberts, W. C. Brayton, Frederick A. Paul and Helen A. Palmer, all of Syracuse.

THE NEW BEDFORD COPPER WORKS, New Bedford, Mass., started their plant on Monday, after a temporary shut down.

THE MISSOURI STOVE & HARDWARE COMPANY, of Kansas City, Mo., have been chartered, with a capital of $10,000.

THE MARTIN HEATING COMPANY, St. Paul, Minn., have filed articles changing their name to that of the Archambo Martin & Morsk Company.

J. H. Demmler, the founder of the works of the United States Iron & Tin Plate Mfg. Company, at Demmler Station, a few miles from Pittsburgh, died on Saturday, the 26th ult., at the residence of his son-in-law, F. E. Schenck, in the East End, Pittsburgh. Mr. Demmler was in the 85th year of his age, and his death was due to general debility. He was born in Germany, but came to Pittsburgh early in life and for a number of years conducted a tin store on Liberty street in that city.

Metal and Miscellaneous Prices.

CHICAGO, AUGUST 31, 1893.

Tin—
Straits pigs.....21½¢

Imported Tin Plates—
Charcoal Plates.—Bright.

Guaranteed Plates command special prices, according to quality.

		Per box.
Calland'and Melyn Grade	IC, 10 x 14	@ $6.75
	IC, 12 x 12	@ 6.75
	IC, 14 x 20	@ 6.75
	IC, 20 x 28	@ 13.50
	IX, 10 x 14	@ 8.75
	IX, 12 x 12	@ 8.75
	IX, 14 x 20	@ 8.75
	IX, 20 x 28	@ 17.50
	DC, 12½ x 17	@ 6.50
	DX, 12½ x 17	@ 8.50
Allaway Grade,	IC, 10 x 14	@ 6.50
"	IC, 12 x 12	@ 6.50
"	IC, 14 x 20	@ 6.50
"	IC, 20 x 28	@ 13.00
"	IX, 14 x 20	@ 8.00
"	IX, 20 x 28	@ 16.00

Coke Plates—Bright.

		Per box.
Steel Coke—	IC, 10x14..14x20.	$5.85 @ $6.00
	IC, 14x20.90 ℔	5.60 @ 5.75
	IC, 14x20, 100 ℔	@ 5.85
	10 x 20	8.75 @ 9.00
	20 x 28	11.70 @ 12.00
	X, 10x14, 14 x 20	@ 7.50
B.V. Grade.	IC, 10x14, 14x20.	5.85 @ 6.00

Charcoal Plates.—Terne.

Guaranteed Plates command special prices, according to quality.

Hansel and Dean Grades.—	
IC, 14 x 20	@ $5.62½
20 x 28	@ 11.25
IX. 20 x 28	@ 14.25
Worcester Brand and equal.—	
IC, 14 x 20..	6.12½@ .....
IC, 20 x 28..	12.25 @ .....
IX, 14 x 20..	7.62½@ .....
20 x 28..	15.25 @ .....

American Tin Plates.
Charcoal Plates.—Bright.

Irondale, A. A.—	IC, 14 x 20 ..... $7.00
" "	IX, 14 x 20 ..... 9.00
" "	IXX, 14 x 20 ..... 11.00
" "	IC, 20 x 28 ..... 14.00
" "	IX, 20 x 28 ..... 18.00
" "	IXX, 20 x 28 ..... 22 00
Florence.—	IC, 10 x 14, 12 x 12, 14 x 20.. $6.75
	IX, 10 x 14, 12 x 12, 14 x 20.. 8.50
Palma.—	IC, 10 x 14, 12 x 12, 14 x 20.. $7.25
	IX, 10 x 14, 12 x 12, 14 x 20.. 9.25

Each extra cross $2.00 and 20 x 28 double these prices.

Brilliant, Tissue Packed,	IC, 14 x 20. $9.25
Royal, extra,	IC, 14 x 20.... 7.25
Merlon,	IC, 14 x 20..... 7.00
Almond,	IC, 14 x 20..... 6.50
Mint,	IC, 14 x 20..... 6.25

Coke Plates.—Bright.

Elwood.—	IC, 14 x 20 ..... $6.00
"	IC, 20 x 28 ..... 12.50

Roofing Plates.

Arch,	IC, 20 x 28 ..... @ $11.75
Crescent,	IC, 20 x 28 ..... @ 12.25
Crescent,	IX, 20 x 28 ..... @ 15.25
Empire,	IC, 20 x 28 ..... @ 12 50
Empire,	IX, 20 x 28 ..... @ 15.50
Hickory,	IC, 20 x 28 ..... @ 12.75
"	IX, 20 x 28 ..... @ 15.75
Alaska (heavily coated),	IC, 20x28 @ $14.50
Alaska	IX, 20 x 28 ..... @ 17.75
Special,	IC, 20 x 28 ..... @ 15.50
"	IX, 20 x 28 ..... @ 18.50
Merchant's Roofing (extra coated),	IC, 20 x 28 ..... @ $17.75
Merchant's Roofing (extra coated),	IX, 20 x 28 ..... @ $21.50
Merchant's Old Method, (extra heavily coated),	IC, 20 x 28 ..... @ $19.75
Merchant's Old Method (extra heavily coated),	IX, 20 x 28 ..... $23.60
Irondale A:	IC, 14 x 20 ..... $6.25
	IX, 14 x 20. ..... 7.75
	IC, 20 x 28 ..... 12.50
	IX, 20 x 28 ..... 15.50
Westmoreland:	IC, 14 x 20 ..... $6.25
	IC, 20 x 28 ..... 12.50
Elwood:	IC, 20 x 28 ..... $12.00
Juno:	IC, 14 x 20 ..... $5.75
	IC, 20 x 28 ..... 11.50
Illinois, Old Method:	IC, 20 x 28 ..... $17.00
E. L.:	IC, 20 x 28 ..... $12.50
Jessie:	IC, 20 x 28 ..... $12.00
Scott's Extra Coated, Stamped and Resquared,	IC, 14 x 20 ..... $9.50
Scott's Extra Coated, Stamped and Resquared,	IX, 14 x 20 ..... 11.00
Scott's Extra Coated, Stamped and Resquared,	IC, 20 x 28 ..... 19.00
Scott's Extra Coated, Stamped and Resquared,	IX, 20 x 28 ..... 22.00
Neville, Stamped,	IC, 14 x 20 ..... 6.25
" "	IX, 14 x 20 ..... 7.50
" "	IC, 20 x 28 ..... 12.50
" "	IX, 20 x 28 ..... 15.00
Taylor's Old Style,	IC, 14 x 20 (Stamped and Resquared) $9.50
Taylor's Old Style,	IC, 20 x 28 (Stamped and Resquared) 19.00
Taylor's Roofing,	IC, 14 x 20 (Stamped and Resquared) 8.25
Taylor's Roofing,	IC, 20 x 28 (Stamped and Resquared) 16.50
Columbia,	IC, 14 x 20 (Stamped) 7.25
"	IC, 20 x 28 (Stamped) 14.50
Maple,	IC, 14 x 20 (Stamped) 6.75
"	IC, 20 x 28 (Stamped) 13.50
Willow,	IC, 14 x 20 ..... 6.50
"	IC, 20 x 28 ..... 13.00
Knoxall,	IC, 14 x 20 ..... 6.25
"	IC, 20 x 28 ..... 12.50
Globe,	IC, 14 x 20 ..... 6.00
"	IC, 20 x 28 ..... 12.00
Miami,	IC, 14 x 20 ..... 6.00
"	IC, 20 x 28 ..... 12.00
"	IX, 20 x 28 ..... 15.00
"	(Redipped), IC, 20 x 28 ..... 17.00

Tin Boiler Plates.

	Per box of 100 sheets.	Per box of 112 sheets.
X, 14 x 28	$13.00	$13.00
XX, 14 x 28	14.50	14.50
X, 14 x 31	14.50	15.80
XX, 14 x 31	16.50	17.50

	Per box of 56 sheets.	
X, 14 x 56	29.50	16.50
XX, 14 x 56	32.50	18.20
X, 14 x 60	31.50	17.65
XX, 14 x 60	35.50	20.90

Sheet Iron—
Black.

Nos.	Common American	Refined.
Nos. 10 to 16	℔ 2 6 10¢	3 2-10¢
17 to 20	℔ 2 7-10¢	3 3 10¢
21 to 24	℔ 2 8-10¢	3 4-10¢
25 and 26	℔ 2 9-10¢	3 5-10¢
27	℔ 3¢	3 6 10¢

Russia, Planished, &c.

Genuine Russia, all numbers....13¢ net.
Patent Planished....℔ D A, 10½¢; B, 9½¢ dis. 5%

Galvanized.

Juniata or first quality.....dis. 70&5%

Copper—
Ingot.

Lake.....11¾¢ @ 12¼¢
Casting Brands.....11¢ @ 11½¢

Sheet and Bolt.

Discount, 25%.

Copper Bottoms.

Discount, 25%.

Seamless Brass and Copper Tubes.

Base price, 17½¢, Chicago, with extras according to size.

Copper, Bronze and Gilding Tube, 3¢ ℔ ℔ additional.

Brazed Brass Tubing.
(To No. 20 inclusive.)

Add freight from New York to Chicago to these prices, or 50¢ ℔ 100 ℔.

Above 5-16 inch to 3 inch inclu...	35¢
Plain, above 3 inch	45¢
Plain, 5-16 inch	45¢
Plain, ¼ inch	60¢
Plain, 3-16 inch	$1.00
Plain, ⅛ inch	$1.50
Fancy Tubing, Brass, to No. 20 incl	43¢ ℔
Bronze Tubing, 3¢ ℔ ℔ more than Brass	

35 @ 40%

Roll and Sheet Brass.

Discount, 35 @ 40%.

Slab Spelter—
Western Spelter.....5

Sheet Zinc—
600 ℔ casks.....6¼¢
300 ℔ casks.....6½¢
Loose sheets.....6¾¢

Lead—
Soft Pig Lead.....4½¢
Bar.....4.60¢@5¢
Pipe.....5½¢, dis. 10¢
Block Tin Pipe.....35¢
Sheet.....6¢, dis. 10¢

Solder—
½&½.....13¢@13¼¢
Extra Wiping.....11½¢

The prices of the many other qualities of Solder in the market indicated by private brands vary according to composition.

Antimony—
Cookson.....12½@12¾¢
Hallett's.....11¼¢@11½¢

Wrought-Iron Pipe—
List on following page.

1¼ and under, Plain	57½&10%
1¼ and under, Galv	52½&10%
1½ and over, Plain	67½&10%
1½ and over, Galv	60&10%

Boiler Tubes, list Oct. 24, 1892...65@67½%
Casing, list Nov. 16, 1892.....52½%
Inserted Joints Casing, list Nov. 16, 1892.....47½%
Steel Boiler Tubes.....27½%
Cold Drawn Seamless Steel Tubing...50%

Cast-Iron Soil Pipe—
Cast-Iron Soil Pipe, Tarred; sizes 2 to 6 inches, inclusive.....dis 70&2½%
Other sizes.....dis 60%

Leader Pipes—
Abendroth's Galv. Spiral Riveted.....60%
Austin's Corrugated.....60%
Gordon & Gilbert's Corrugated.....60%
Ritchie's (Galv. Iron only) Cor'd.....60%
Ritchie's Spiral Lock Seam, Galv'd....55%
Austin's Spiral Ribbed Pipe.....60%
Plain Adjustable Elbows.....60%
James A. Miller Bros. (Galv'd Iron only) Corrugated.....60%

Furnace Fittings—
Discount from Excelsior Steel Furnace Co.'s list.....50%

Steel Roofing—
Perfection.....$3.75 square
Climax.....$3.50 square
The Lloyd Spanish Tiling....$4.50 square

Metallic Shingles—
Cushman's.....$1.25 square
Merchant & Co.'s Spanish Tiles:
Copper, 14 oz.....$36.00 square
Tin.....$9.75@$14.25 square
Steel, painted.....$9.00 square

Drain Pipe—
Discount from list.....50%

Paints Oils, &c.—
Deodorized Benzine.....7½@8 ¢
Iron Paint, Bright Red.....℔ D, 2 ¢
" " Brown.....℔ D, 1½¢
" " Purple.....℔ D, 2½¢
" Ground in oil, B. Red℔ D, 6½¢
" Ground in oil, Red..℔ D, 6½¢
" Ground in oil, Brown℔ D, 6½¢
" Ground in oil, Purple℔ D, 6 ¢
Linseed Oil, Boiled, in bbls.....53¢
Linseed Oil, Raw, in bbls.....50¢
Mineral Paints.....2@4¢
Orange Mineral.....10½¢
Pure White Lead in Oil.....6¾@7½¢
Dry White Lead in bbls.....6¼@6½¢
Red Lead, American.....7@7½¢
Red Venetian, English, dry...$1.65@$1.70
Red Venetian in oil; asst'd cans, 8½¢; kegs.....7½¢
Sipe's Japan Oil, in bbls, ℔ gal.....34¢
Spirits Turpentine, in bbls., ℔ gal..32½¢
Asphaltum, Trinidad Refined, ℔ ton..$45
Tarred Felt, 1 Ply, ℔ 100 ℔.....$1.65
Tarred Felt, 2 Ply, ℔ roll 108 sq. feet.....$1.50
Tarred Felt, 3 Ply, ℔ roll of 108 sq. feet.....$2.00
Roofing Pitch, ℔ bbl. of 300 ℔.....$3.20

NEW YORK, SEPTEMBER 1, 1893.

The following quotations are for small lots.

Aluminum—
No. 2 Grade Metal, in ton lots..℔ D, $0.75
No 1 (guaranteed to be 98 % pure and over), in ton lots .....℔ D .90
Lots less than 1 ton, 10¢ ℔ D additional.

Antimony—
Cookson.....℔ D, 11¢
Hallett's.....℔ D, 10½¢

Brass—
Planished.....net
Roll and Sheet.....35@40%

Brass and Copper Tubes
Brazed Brass Tubing—
List May 20, 1889.

	Per D.	
Plain, to No. 20 inclusive, above 5-16 inch to 3 inch inclusive	$0.35	35@40%
Plain, to No. 20, above 3 inch	45	
Plain, 5-16 inch to No. 20	45	
Plain, ¼ inch	60	
Plain, 3-16 inch	1.00	
Plain, ⅛ inch	1.50	
Fancy Tubing to No. 20, inclu	43	

Copper and Bronze Tubing—
3¢ ℔ D more than brass.

Bronze, Tobin—
Drawn Rods for Bolts, Forgings, &c
Over ¼ to 3½ inches inclusive....17¢ ℔ D
Over 3½ to 5 inches inclusive.....18¢ ℔ D

Piston Rods, Finished True, Smooth and Straight.
Over ¼ to 3½ inches inclusive....18¢ ℔ D
Over 3½ to 5 inches inclusive.....19¢ ℔ D

Clips—
Buffalo Damper: Nos. 1, $1.25; 2, $2.50 per doz.....40&10%

Conductors—
Corrugated. *Round or Square—*
Galvanized.....60%
Galvanized, Locked Joints.....60%
Tin.....60%

Spiral Riveted—
Galvanized.....50%
See also *Elbows and Shoes; Eave-Trough Miters; Strainers, Conductor.*

Conductor Strainers—See *Strainers, Conductor.*

Copper—
Bottoms, Pits and Flats....25@25&5%
Ingot.
Lake.....11¢
Ansonia Grade Arizona.....10½¢
Ansonia Grade Casting.....10¢
Planished......net
Sheet and Bolt.....25&25&5%

Tubes—See *Seamless Brass Tubes.*

Coppers, Soldering—
See *Irons, Soldering*, in Current Hardware Prices.

Damper Clips Buffalo—
See Clips, Buffalo Damper.

Eave Troughs—
Lap or Slip Joint, Galvanized.....60&10%
Lap or Slip Joint, Terne.....60%

Eave-Trough Mitres—
Lap or Slip Joint.....list, net

Elbows—
Plain Adjustable—
Tin.....70%
Galvanized.....70%

Crimped Tubing—
Re-Tinned or Galvanized.....35%

Stove-Pipe—
Buffalo Four-Piece.

4½	5	5½	6	7 inch,
$0.78	.87	.90	.99	1.20 per doz..20 %

Elbows and Shoes—
Flat Crimp.
Tin.....35%
Galvanized.....35%

Corrugated.
Flat Crimp.
Galvanized.....60%

Round or Square.
Tin.....60%
Galvanized.....60%

Iron, Sheet—
Black.

	Common American.	R. G. Cleaned American.
Nos. 10 to 16	℔ D, 2½.....	3.10¢
Nos. 17 to 20	℔ D, 2.85.....	3.10¢
Nos. 21 to 24	℔ D, 2.90.....	3.20¢
Nos. 25 and 26	℔ D, 3.05.....	3.30¢
No. 27	℔ D, 3.15.....	3.40¢
No. 28	℔ D, 3¼.....	3½¢
American B. B.	℔ D,	4¢@4½¢

Russia, Planished, &c.
Genuine Russia, according to assortment.....℔ D, 11¾@12½¢
Patent Planished....℔ D, A, 10¢; B, 9¢, 5%
Craig Polished Sheet.....℔ D, 8½¢

Galvanized.

	B. B.	
Nos. 10 to 16		70&5% @ 72½%
Nos. 17 to 22		
Nos. 23 to 24		
Nos. 25 to 26		
No. 27		
No. 28		
Nos. 29 and 30		

Filter Joints—
Lee's.....33⅓ %

Lead—
American Pig.....4¢
Bar.....4½¢

New York Prices.
Pipe.....6¼¢, 20%
Tin Lined Pipe.....15¢, 20%
Block Tin Pipe.....37½¢, 20%
Sheet.....7¢, 20%
Old Lead in exchange, 3¼¢ ℔ D.

Metal, Expanded—
Manufacturers' list No. 5.
Lathing.....10%
Fencing, Painted Sheets.....20%
Netting, Painted Sheets.....20%
Door Mats, Galvanized.....25%
Window Guards, Paneled.....15%
Tree Guards, Paneled.....15%

Mitres Eave-Trough—See *Eave-Trough Mitres.*

Paints Oils &c.—

Lead, Amn. White, in oil	6¾ @ 7¼
Lead, Red, bbls. and ½ bbls	6½ @ 7
Lead, Red, kegs	6½ @ 7
Ocher, American	1 @ 1¼
Red, Venetian, American	1½ @ 2½

Linseed Oil:
Raw, ₩ gal..... @ .40
Boiled..... @ .43

Spirits Turpentine:
In bbls..... @ .32

Putty:
In barrels and ½ bbls..... .01¾ @ .01¾
In tubs..... .01⅞ @ .01¾
In tin cans..... .01½ @ .02¼
In bladders..... .01⅞ @ .02¼

Roofing Material, &c.:
Asphaltum, Trinidad Refined, ₩ ton..... $30.00@$35.00
Asphaltum, Rock, ₩ ton..... $14.00
Coal Tar Felt, 1 Ply, ₩ ℔..... 2¢
Coal Tar Felt, 2 Ply, ₩ roll 108 sq. ft. $1.42½
Coal Tar Felt, 3 Ply, ₩ roll 108 sq. ft. $1.81
Roofing Pitch, ₩ bbl..... $2.24

Pipe, Drain 50%

Pipe and Fittings, Cast Iron Soil—

Cast-Iron Soil Pipe, Tarred, sizes 2 to 6 inches, inclusive..... 60@60&10%
Other sizes..... 55@55&10%
Cast-Iron Fittings, Tarred, sizes 2 to 6 inches..... 60@60&10%
Other sizes..... 55@55&10%

Pipe, Spiral—

Galvanized..... 60%
Tin..... 60%

Rock and Slag Wool—

	₩ ℔	₩ cub. foot.
Slag Wool, ordinary	1¼	19¢
Slag Wool, extra	4¼	38½¢
Rock Wool, ordinary	2¼	27¢
Rock Wool, extra	7¼	43½¢

Rosin—

Common and Good—Strained,
Rosin, C. & D..... ₩ bbl. $1.02@$1.05
Rosin, E. & F..... ₩ bbl. $1.15@$1.30
Rosin, G. & H..... ₩ bbl. $1.45@$1.70
Rosin, I. & K..... ₩ bbl. $1.90@$2.35
Rosin, M. & N..... ₩ bbl $2.50@$3.50

Seamless Brass Tubes..net

Shoes and Elbows—See *Elbows and Shoes.*

Slate Roofing—

According to size, f.o.b. cars, Quarry Station.

Pennsylvania:
Best Bangor, ₩ sqr..... $3.25@$4.50
Pen Argyle, ₩ sqr..... 3.50@ 4.25
Peach Bottom, ₩ sqr..... 5.00@ 6.25
No. 1 Chapman, ₩ sqr..... 4.00@ 4.65
Lehigh Slates, ₩ sqr..... 3.00@ 4.50
Vermont:
Sea Green, ₩ sqr..... 2.70@ 3.20
Purple, ₩ sqr..... 3.50@ 4.50
Unfading Green, ₩ sqr..... 3.50@ 4.00
Red, ₩ sqr..... 9.75@12.00

Solder and Soldering Fluids—

Solder—

½ & ½ (Guaranteed)..... 13½@14½¢
No. 1..... 11¾@12 ¢
Prices of Solder indicated by private brands vary according to composition.

Soldering Fluids—

Concentrated Soldering Flux.
f.o.b. New York.
In barrels, ₩ ℔..... 4¢
Smaller quantities, ₩ ℔..... 5¢

Gedney's Soldering Fluid.
In carboys or barrels, ₩ ℔..... 2¢
$1.50 for carboy or barrel; money refunded when returned.

Perfection Soldering Flux.
No charge for package.
3 bbls., about 500 ℔, ₩ ℔..... 3½¢
2 bbls., about 300 ℔, ₩ ℔..... 4¢
Kegs, about 110 ℔, ₩ ℔..... 4¢
75¢ extra for keg. 5% dis.
Kegs, about 55 ℔, ₩ ℔..... 4¢

Yager's Soldering Salts.
½-℔ bottles, each..... 30¢
Large quantities, per ℔..... 40¢

Spelter—

Western Spelter..... 4½¢@4¾¢
Bertha..... .....

Spiral Pipe—See *Pipe, Spiral.*

Stove-Pipe Elbows—*See Elbows, Stove Pipe.*

Stove Polish—See *Polish, Stove.*

Stove Trucks—See *Trucks, Stove.*

Strainers Conductor—

Galvanized..... 60%

Tin, Pigs and Bars—

Banca, pigs, ₩ ℔..... 21½¢
Straits, pigs, ₩ ℔..... 21¢
Straits in bars, ₩ ℔..... 22¢

Tin Plates—

American Terne Plates—

Apollo Roofing.

IC, 14 x 20..... $6.25
IC, 20 x 28..... 12.50
IX, 14 x 20..... 7.25
IX, 20 x 28..... 14.50

Buckeye.

IC, 14 x 20..... $7.00
IC, 20 x 28..... 14.00
IX, 14 x 20..... 8.25
IX, 20 x 28..... 16.50
IXX, 14 x 20..... 9.50
IXX, 20 x 28..... 19.00

De Mill's.

First New York, IC, 14 x 20..... $5.75
" " " IC, 20 x 28..... 11.50
First New Jersey, IC, 14 x 20..... 5.75
" " " IC, 20 x 28..... 11.50
Manhattan, IC, 14 x 20..... 7.00
" IC, 20 x 28..... 14.50

Dunlap's.

Double Dipped, IC, 14 x 20..... $8.25
" IC, 20 x 28..... 16.50
" " IX, 14 x 20..... 9.50
" " IX, 20 x 28..... 19.00
Domestic, IC, 20 x 28..... 12.00
" IX, 20 x 28..... 15.00

Glendale Tin Plate Co.

Optimus, Best Redipped, IC, 14 x 20. $8.25
" " " IC, 20 x 28. 16.50
" " " IX, 14 x 20. 9.75
" " " IX, 20 x 28. 19.50
N. F., Old Style, IC, 14 x 20..... 7.50
" " " IC, 20 x 28..... 15.00
" " " IX, 14 x 20..... 9.00
" " " IX, 20 x 28..... 18.00
Bonus, Extra Coated, IC, 14 x 20... 6.75
" " " IX, 14 x 20... 8.25
" " " IC, 20 x 28...13.50
" " " IX, 20 x 28...16.50

Gummey, Sperring & Co.

	14 x 20	20 x 28
IC Terne, Pennsyl Old Method, Treble Coated	$8.50	$16.75
IC Terne, Leominster, Extra coated	7.75	15.00
IC Terne, Waldo, Redipped	7.25	14.00
IC Terne, Alderly, Extra quality	6.37½	12.50
IC Terne, Phoenix	5.80	11.50
IC " Climax	5.70	11.25
IC " Venux	5.60	11.00
IC " Flag	5.50	10.50

Hamilton's.

Hamilton's Best Redip'd, IC, 14x20 $9.25
" " " IC, 20x28 18.50
" " " IX, 14x20 10.75
" " " IX, 20x28 21.50
Osceola Hand Coated, IC, 14x20 8.25
" " " IC, 20x28 16.50
Osceola Hand Coated, IX, 14x20 9.75
" " " IX, 20x28 19.50
Lula Best Charcoal, IC, 20x28 12.50
" " " IX, 20x28 16.00

Laufman's.

Apollo, IC (Resquared), 14 x 20.....$8.12
Apollo, IX (Resquared), 14 x 20..... 9.37
Apollo, IC (Resquared), 20 x 28.....16.00
Apollo, IX (Resquared), 20 x 28.....18.50
Apollo, IC (Resquared), 20 x 56.....16.00
Apollo, IX (Resquared), 20 x 56.....18.50
Tip Top, IC (Resquared), 14 x 20..... 6.62
Tip Top, IX (Resquared), 14 x 20..... 7.88
Tip Top, IC (Resquared), 20 x 28.....13.00
Tip Top, IX (Resquared), 20 x 28.....15.50
Allegheny, IC, 14 x 20..... 6.12
Allegheny, IX, 14 x 20..... 6.38
Allegheny, IC, 20 x 28..... 12.00
Allegheny, IX, 20 x 28..... 12.50

McKinley Tin Plate Co.

McKinley:
IC, 20 x 28..... $12.00
IX, 20 x 28..... 15.00
Fort Pitt.
IC, 20 x 28..... $11.00
Chicago:
I. , 20 x 28..... 11.50
Wilkinsburg Redipped:
IC, 20 x 28..... $16.00
IX, 20 x 28..... 19.00

Merchant's.—All Stamped

Crescent, IC, 20 x 28..... $12.00
Crescent, IC, 14 x 20..... 6.00
Hickory, IC, 20 x 28 (Resquared).. 12.75
Hickory, IC, 14 x 20 (Resquared)...6.37½
Empire, IC, 20 x 28..... 12.25
Empire, IC, 14 x 20..... 6.12½
Alaska, IC, 20 x 28 (Resquared).... 14.00
Alaska, IC, 14 x 20 (Resquared).... 7.00
Merchant's Roofing, IC, 20 x 28 (Resquared)..... 17.00
Merchant's Roofing, IC, 14 x 20 (Resquared)..... 8.50
Merchant's Old Method, IC, 20 x 28 Resquared)..... 19.00
Merchant's Old Method, IC, 14 x 20 (Resquared) 9.50

Merry's.

Lion, IC, 14 x 20 (Stamped).....$6.25
IC, 20 x 28..... 12.50
Palacio, IC, 14 x 20..... $5.55
IC, 20 x 28..... 11.00

Pittsburgh Tin-Plate Works.

Kensington:
IC, 14 x 20..... $6.75
IC, 20 x 28..... 13.50
IX, 14 x 20..... 8.00
IX, 20 x 28..... 16.00
Westmoreland:
IC, 14 x 20..... $6.25
IC, 20 x 28..... 12.50
Juno:
IC, 14 x 20..... $5.75
IC, 20 x 28..... 11.50

Scott's.—All Stamped.

Scott's Extra Coated, IC, 14 x 20 (Resquared)..... $9.25
Scott's Extra Coated, IX, 14 x 20 (Resquared)..... 10.75
Scott's Extra Coated, IC, 20 x 28 (Resquared)..... 18.50
Scott's Extra Coated, IX, 20 x 28 (Resquared)..... 21.50
Neville, IC, 14 x 20..... 6.00
" IX, 14 x 20..... 7.25
" IC, 20 x 28..... 12.00
" IX, 20 x 28..... 14.00

N. & G. Taylor Co.'s.

Taylor, Old Style, IC, 14 x 20 (Stamped and Resquared)..... $9.25
Taylor Old Style, IC, 20 x 28 (Stamped and Resquared)..... 18.50
Taylor Roofing, IC, 14 x 20 (Stamped and Resquared)..... 8.00
Taylor Roofing, IC, 20 x 28 (Stamped and Resquared)..... 16.00
Columbia, IC, 14 x 20 (Stamped)... 7.00
Columbia, IC, 20 x 28 (Stamped)... 14.00
Maple, IC, 14 x 20 (Stamped)..... 6.50
Maple, IC, 20 x 28 (Stamped)..... 13.00
Willow, IC, 14 x 20..... 6.25
Willow, IC, 20 x 28..... 12.50
Knoxall, IC, 14 x 20..... 6.00
" IC, 20 x 28..... 12.00
Globe, IC, 14 x 20..... 5.75
Globe, IC, 20 x 28..... 11.50

A. A. Thompson & Co.'s.

Old Colony, IC, 14 x 20.....$8.00
" " IC, 20 x 28.....16.00
Thompson's Puritan, IC, 14 x 20.....5.75
" " IC, 20 x 28....11.50
Durham, IC, 14 x 20.....5.75
" IC, 20 x 28 .....11.50
Central, IC, 14 x 20..... 5.45
" IC, 20 x 28.....10.75
" WC, 14 x 20..... 5.25
" WC, 20 x 28.....10.25
Tarn, IC, 20 x 28.....10.50

U. S. Brands.—All Stamped.

U. S. Monongahela, IC, 14 x 20.....$6.50
U. S. Redipped, IC, 14 x 20..... 9.25
20 x 28 double the price of 14 x 20

American Bright Plates—

Continental Tin Plate Works.

	"Phoenix" extra.	Climax
IC, 14 x 20, Bright	$6.50	$6.25
IX, " "	8.00	7.75

All sizes and thicknesses, etc.

Merchant's.

Merchant's Dipped, IC, 14x20.....$11.00
Palma Xtra, IC, 14x20.....7.25
Florence, IC, 14x20.....6.75

Merry's

Hazel, IC, 14x20.....$5.85

N. & G. Taylor Co.'s.

Brilliant, Tissue Packed, IC, 14x20..$9.00
Royal, extra, IC, 14x20.....7.00
Merion, IC, 14x20.....6.75
Linden, IC, 14x20.....6.50
Almond, IC, 14x20.....6.25
Mint, IC, 14x20.....6.00

U. S.

IC, 14x20.....$7.25
IC, 20x28.....14.50

Imported Terne Plates—

Charcoal.

Dean Grade.—IC, 14 x 20.....@$5.50
20 x 28.....@11.00
IX, 14 x 20.....@ 6.75
20 x 28.....@13.50
Abercarne Grade.—IC, 14 x 20....@ 5.40
20 x 28.....@10.80
IX, 14 x 20...@ 6.62½
20 x 28.....@13.25

Imported Bright Plates—

Charcoal.

Duty: 2.2¢ ₩ ℔.

Melyn and Caliland Grade. IC, 10 x 14.....@$6.50
" " IC, 12 x 12.....@ 6.75
" " IC, 14 x 20.....@ 6.50
" " IC, 20 x 28.....@13.00
" " IX, 10 x 14.....@ 8.50
" " IX, 12 x 12.....@ 8.75
" " IX, 14 x 20.....@ 8.50
" " IX, 20 x 28.....@17.00
" " DC, 12½ x 17.....@ 6.00
" " DX, 12½ x 17.....@ 8.00
Allaway Grade. IC, 10 x 14.....@ 6.00
" " IC, 12 x 12.....@ 6.25
" " IC, 14 x 20.....@ 6.00
" " IC, 20 x 28.....@12.00
" " IX, 10 x 14.....@ 7.50
" " IX, 12 x 12.....@ 7.75
" " IX, 14 x 20.....@ 7.50
" " IX, 20 x 28.....@15.00
" " DC, 12½ x 17.....@ 5.50
" " DX, 12½ x 17.....@ 7.00

Coke.

Steel Coke.—IC, 10x14, 14x20.$5.40@$5.50
10x20.....@ 8.50
20x28.11.50@12.00
IX, 10x14, 14x20.....@ 6.75
B. V. Grade.—IC, 10x14, 14x20....@ 5.50

Imported Boiler Plates.—

IXX, 14x26..(112 sheets)..... ..@$13.35
IXX, 14x28..(112 sheets)..... ..@ 14.50
IXX, 14x31..(112 sheets)..... ..@ 16.00

Tinning—

Brass and Copper.....net

Tubing—

Brass and Copper.—

Standard List..... 35@40%

Troughs, Eave—See *Eave Troughs*

Trucks Stove—

Improved Lock Frame, per doz....$15.00
Steel Lock Frame, per doz..... 18.00
Daisy Improved Pattern, ₩ doz..... 18.00

Zinc—

600 ℔ casks..... 6¼¢
Per ℔..... 7¢

News and Notes.

Nova Scotia produced last year 1,942,782 tons of coal and 75,000 tons of iron ore.

The Massachusetts Institute of Technology has established a course of study in naval architecture. Heretofore this subject could only be studied by a visit to the technical schools of Europe.

A circular letter from Charles Lyman, president of the United States Civil Service Commission, Washington, D. C., states that there is a demand for more fourth assistant examiners in the Patent Office than the Civil Service Commission is able to supply, as the examination can only be passed by those who have an advanced education in the sciences. The subjects of the examination are: Physics, technics, mathematics and chemistry, and mechanical drawings. A pamphlet containing sample questions, and also containing the dates and places at which examinations may be taken, will be furnished to those who desire to become applicants. The salary of the position is $1200 per annum.

An estimate made by the London *Times* places the net loss experienced by the failure of crops this year in Great Britain, due to the prolonged drought, at not less than £2 per acre, or about $336 000,000 on the spendable income of England. A further estimate of the losses for last year and this shows that the aggregate reduction in the income of farmers throughout the United Kingdom from crop failures alone comes to a little over $504,000,000. This is a sufficiently serious state of things, and it is not to be wondered at that money is reported as scarce and trade as very bad in the agricultural districts.

Cable dispatches from England report that the scarcity of coal, caused by the great strike, is being keenly felt at British ports. Many steamships which have coaled regularly at London are now taking in their supplies at Continental ports, and it is likely that the Atlantic liners will be compelled to draw their fuel almost entirely from American sources.

The *Journal des Mines* has published some interesting statistics of the world's coal fields. From these it appears that of the entire known coal area the United States has 58.7 per cent., and British America has 13.1 per cent., while England has but 2.8, and Spain, France, Germany and Belgium have together 1.9 per cent. The total production of coal in 1891 is estimated to have been 520,000,000 tons, of which 150,000,000 tons was produced in the United States.

The great fire which devastated South Chicago last week embraced in its area of destruction the dwellings of most of the employees of the Illinois Steel Company.

Baltimore wants a ship canal across the Eastern Shore peninsula.

On August 24 the national bank note circulation of the United States for the first time passed the $200,000,000 mark. The increase since January 1 has been more than $30,000,000.

LABOR EXCHANGE.

Notices under this heading of reasonable length are inserted free of charge. Only those relating to employment are admitted. Write distinctly on one side of paper only, and do not use postal cards.

HELP WANTED.

A good TIN and SHEET-IRON WORKER; one accustomed to roofing, spouting and pump work; none but steady men need apply. Lee & Bunce, Riverhead, Long Island, N. Y. Sept. 2

An experienced FOREMAN in steel range, tin, copper and sheet-iron ware factory. "Range," office of *The Metal Worker*, 96-102 Reade street, New York City. Sept. 2

One or two middle aged, steady, reliable men, experienced in tin, sheet iron, range, furnace and general jobbing work; good position to good men. Canfield Stove Company, Rondout, N. Y. Sept. 2

A good jobbing PLUMBER; one who can do gas fitting and tinning also; to a sober and steady young man who is not afraid to work I can offer steady job the year round; prefer one who has formerly been a Nova Scotian; state experience. J. N. Dauphine, 98 Dean street, Providence, R. I. Sept. 2

Good men in any of the States west of Ohio, including Ohio, to sell a good line on commission; any one desiring to carry a side line please write us for particulars, at the same time stating what line you are handling now. Lock Box 364, Peoria, Ill. Sept. 2

SALESMAN thoroughly acquainted with retail hardware and tinware trade to represent a manufacturer in each of the following States: Iowa, Michigan, Minnesota, Indiana, Wisconsin, New York, Illinois, Missouri, Pennsylvania, Ohio, Nebraska, Kansas, Massachusetts; must furnish first-class references. "Manufacturer," office of *The Metal Worker*, 59 Dearborn street, Chicago, Ill. Sept. 2

SLATE ROOFERS; first-class workmen; apply at once. Armory Building, corner Atlantic and Bedford avenues, Brooklyn, N. Y. Sept. 2

CORNICE WORKER. T. B. Peet & Co., Springfield, Ohio. Sept. 2

GALVANIZED IRON CORNICE MAKERS wanted. Williams & Monogue, Troy, N. Y. Sept. 2

A first-class man to work on heavy galvanized iron; state salary. "G.," Box 826, office of *The Metal Worker*, 96-102 Reade street, New York City. Aug. 26

A FOREMAN for skylight and cornice shop; state salary and experience. "G.," Box 826, office of *The Metal Worker*, 96-102 Reade street, New York City. Aug. 26

A TINSMITH, who can also do plumbing and piping; steady job to a steady man. Wm. H. Clarke, Southbridge, Mass. Aug. 26

At once, two or three young men, TINSMITHS and PLUMBERS; to sober, competent and industrious men a steady job will be given; give age and experience and wages expected. Burbank, Studa & Metze, Berlin, N. H. Aug. 26

SALESMEN visiting retail trade in every State in the Union to carry a good paying side line; small samples; you can easily make $1200 to $1500 per year. "Side Line," office of *The Metal Worker*, 59 Dearborn street, Chicago, Ill. Aug. 26

The address of T. P. Kay, plumber; can have a permanent position if he will inform C. H. Carter, Muncie, Ind.; job is O. K. Aug. 26

At once, a TINNER and GENERAL JOBBER, good pay and steady work for the right man; L. Pease & Son, Hartford, Vt. Aug. 26

A first-class man to superintend a tinware factory in the South; he must be well posted in the manufacture of pieced tinware and stamped tinware and know how to handle men and boys; good references required. "Tinware Factory," office of *The Metal Worker*, 96-102 Reade street, New York City. Aug. 26

SITUATIONS WANTED.

As SHIPPING CLERK or SALESMAN, on the road; I am well acquainted with the trade throughout the country, and thoroughly posted as to all details requisite to fill either situation; can give excellent credentials as to executive ability, habits, &c. E. L. Tallmadge, 14 Woodbine street, Brooklyn, N. Y. Sept. 2

PLUMBER, five and a half years at trade would like a steady place in country shop; is sober and honest, and can furnish reference; state wages. "J. J. B.," Convent, N. J. Sept. 2

As SUPERINTENDENT or FOREMAN of cornice works; have had large experience in the West. E. A. Sanders, 5410 Jackson avenue, Chicago, Ill. Sept. 2

By a TINSMITH and GENERAL JOBBER, with 12 years' experience; some knowledge of plumbing and steam and hot-water fitting; good reference; married; country preferred. G. Jacobs, 4 Willis Block, Pittsfield, Mass. Sept. 2

As ELECTRO PLATER; thorough in all branches of plating and fancy oxidizing; with last firm five years; run 6000 gallons of solution; can furnish best of references; silver white nickel on iron a specialty. "Electro Plater," office of *The Metal Worker*, 96-102 Reade street, New York City. Sept. 2

First-class TINSMITH and SHEET-IRON WORKER; 12 years' experience at inside and outside work; used to all kinds of jobbing done in country town. J. Ditchfield, 171 Passaic street, Trenton, N. J. Sept. 2

By a good TINSMITH; wages low for a steady job; city or country. "H. M.," care Shipman, 47 Lewis street, New York City. Sept. 2

By a first-class PLUMBER and GAS FITTER with reliable party; married; 25 years of age; 10 years' experience; can also do pump work and steam fitting; sober and reliable. Fred. Bowers, Lock Box 40, Lykens, Pa. Sept. 2

By a practical TIN and SHEET-IRON WORKER of 20 years' experience; accustomed to range, furnace, stove and general jobbing, inside or outside; city or country. George Laird, 186 Tenth street, Brooklyn, N. Y. Sept. 2

By a first-class TINSMITH and general jobber, with some knowledge of plumbing and steam fitting; 20 years' experience. Frank Wilcox, Oxford, N. Y. Sept. 2

By a first-class PLUMBER, in the South or West; can furnish reference if required. "C. D.," 402 East Eighty-eighth street, New York City. Sept. 2

FOREMAN for skylight and cornice shop; salary, $5 a day; seven years' experience. A. G. Norling, Passaic, N. J. Sept. 2

An efficient hardware, house furnishing goods, stoves and ranges, crockery and lamp goods man seeks position as BUYER, HEAD CLERK or CLERK; 14 years' business experience; salary not expected above value; satisfactory reference; unmarried. "Mutual," office of *The Metal Worker*, 96-102 Reade street, New York City. Sept. 2

By a good CORNICE CUTTER; able to do any kind of work in this line of business. "Cutter," office of *The Metal Worker*, 96-102 Reade street, New York City. Sept. 2

By a TIN and SHEET-IRON WORKER; 16 years' experience in hot air and hot water, also combination steam and hot water, also worked at wrought-iron range work and steam tables for hotels; would like to get employment with some good firm. Charles Smith, 73 East Louisa street, West St. Paul, Minn. Sept. 2

As SUPERINTENDENT of stove foundry or FOREMAN of mounting department; have had 30 years' experience, 12 years as foreman and eight years in business for myself; understand the business thoroughly; good reference. John Wood, Charleston, Ill. Sept. 2

By a CORNICE CUTTER and DRAFTSMAN who has thorough knowledge of the cornice and roofing business; can give good reference. "H. C.," care of Mr. Naegle, cor. Spaulding avenue and Jackson Boulevard, Chicago, Ill. Sept. 2

At once, an all-round TINNER, one who can do pipe and pump work. Thomas & Taylor, Kennett Square, Pa. Sept. 2

If in need of a young hardwareman of 26, with best of references, and six years' experience in mill, mining and lumbermens' supplies, address 113-115 South Front street, Marquette, L. S., Mich. Sept. 2

By a TINSMITH, good at roofing and cornice work. Herman Rolf, 65 Seigel street, Brooklyn, N. Y. Sept. 2

A STOVE SALESMAN, traveling in Eastern Ohio and Western Pennsylvania, wants some line of goods to sell on commission; can give line about one-half his time; hardware line preferred. "A. M.," 128 Prospect street, Ashtabula, Ohio. Sept. 2

By a STOVE MOUNTER, as FOREMAN or at the bench; 33 years of age, and can furnish good references. "All Around," office of *The Metal Worker*, 96-102 Reade street, New York City. Sept. 2

By a young man, 18 years of age, as TINNER; 18 months' experience; can furnish good reference; at liberty after September 1. Harry Churchill, Odebolt, Iowa. Sept. 2

By a first-class workman, over ten years' experience; thoroughly familiar with sheet-metal roofing and ceiling work, also understands the care and handling of iron roofing machinery, and competent to take charge of men. M. C. James, office of *The Metal Worker*, 22-24 Pickering Building, Cincinnati, Ohio. Aug. 26

Good PLUMBER and GAS FITTER; can take charge of buildings and country work; sober and reliable. B. J. Curry, 362 West Forty-third street, New York City. Aug. 26

An experienced PLATER wants work; understands silver, nickel, brass, copper, oxidizing, lacquers, also polishing, buffing, water rolling; best references. T. McDermott, 2069 E. Madison avenue, Cleveland, Ohio. Aug. 26

A young German TINSMITH, 24 years old, two years in this country, who understands the business in all its branches, wants a steady position. Louis Kenzman, 199 Forsyth street, New York City. Aug. 26

Furnace and stove SALESMAN who is acquainted with the stove and tin trade in New England, and a practical TINSMITH and FURNACE MAN, strictly temperate and can furnish first-class references, would like a situation "Salesman," office of *The Metal Worker*, 146 Franklin street, Boston, Mass. Aug. 26

Steady job for year or more by a good all-round TINNER; 13 years' experience; furnace work, job work, roofing, assortment, stoves, &c.; first-class references; Chicago preferred; state wages. J. D. Green, Urbana, Ill. Aug. 26

PLUMBER; on country or city work; has 20 years' experience; can work from plans or specifications on new or old work, small or large jobs; first-class references. "Sanitary," Box 826, office of *The Metal Worker*, 96-102 Reade street, New York City. Aug. 26

By October 1, a situation as TINNER by an all-round, good every-day workman; am acquainted with the general run of a hardware establishment; can do roofing, furnace work, assortment and general job work; want steady work and not less than 25 cents per hour; total abstainer; last situation three years. S. Wiltshire, Sun Prairie, Wis. Aug 26.

As TINNER or SALESMAN in hardware store anywhere west of the Mississippi by a young, single man; honest, industrious and capable; best of references given. S. W. Moore, New City, Kan. Aug. 26

A steady job as TINNER or HARDWARE CLERK; three years' experience in store and shop on roofing, spouting and tinware; best of habits and references. J. H. Bowers, Navarre, Ohio. Aug. 26

A position as CLERK or TRAVELING SALESMAN for a tinware or stove house; three years' experience; can give the best of references. "H.," 408 Lower Main street, Henderson, Ky. Aug. 26

By a first-class TIN, SHEET IRON and FURNACE MAN, a place that will be steady by the year at good wages; am capable of handling men, taking charge of shop and figuring on all kinds of sheet-metal work; 15 years' experience at the business; best of references. Address, with full particulars, "Furnace," office of *The Metal Worker*, 59 Dearborn street, Chicago, Ill. Aug. 25

Young man 21 years of age desires position with reliable hardware firm; have had two years' experience in retail hardware store of good standing; can furnish best of references as to capabilities and character; wages low. W. H. Platt, Girard, Pa. Aug. 26

As FOREMAN, by a japanner; can furnish best of references. "Japanner," office of *The Metal Worker*, 96-102 Reade street, New York City. Aug. 26

By an experienced TINSMITH, 24 years of age, good jobber; has some knowledge of plumbing. "Tinsmith," Washington street, Hoboken, N. J. Aug. 26

By a first-class PLUMBER, 23 years of age, with six years' experience at the trade; city or country; can furnish the best of references. Albert Johnson, 349 East Fifty-eighth street, New York City. Aug. 26

Steady situation wanted within a month, as TINSMITH and GENERAL JOBBER, or as a clerk in a stove and tin shop; 15 years' experience. C. E. Whelden, Springfield, Vt. Aug. 26

TINSMITH, inside and outside worker, desires a steady job; city or country. "Tinsmith," care of Mr. Labouseur, 322 Washington street, Hoboken, N. J. Aug. 26

By a first-class all round workman at plumbing and general jobbing; can do all kinds of iron piping; steady job desired; can furnish best of references. "Workman, Box 35," office of *The Metal Worker*, 96-102 Reade street, New York City. Aug. 26

By a TINSMITH and GENERAL JOBBER, in the city or country. "Tinsmith," 1575 Avenue A, New York City. Aug. 26

By a first-class TINSMITH and SHEET-METAL WORKER; 15 years' experience; well acquainted with the hardware business, and the best of references. F. A. Thompson, Denver, Col. Aug. 26

A position as SALESMAN by a man of 15 years' experience on the road selling hardware, thoroughly acquainted with shelf and heavy hardware, iron and tinners' stock. "Head," office of *The Metal Worker*, Fifth and Main streets, Cincinnati, Ohio. Aug. 19

THE METAL WORKER.

NEW YORK AND CHICAGO.

Saturday, September 9, 1893.

DAVID WILLIAMS, - PUBLISHER

BUSINESS OFFICES:

NEW YORK.....96-102 Reade Street.
PHILADELPHIA.....220 South Fourth Street.
BOSTON.....146 Franklin Street.
PITTSBURGH..... Room 509 Hamilton Building.
CHICAGO.....59 Dearborn Street, cor. Randolph.
CINCINNATI.....Rooms 22-24 Pickering Building.
ST. LOUIS.....Bank of Commerce Building.
CLEVELAND..... .....312 The Cuyahoga.

BRITISH AGENCY: The Ironmonger, 42 Cannon street, London, England.

Trade Drawing School.

The General Society of Mechanics and Tradesmen of New York will open on the evening of October 5, at 18 East Sixteenth street, the regular session of its free drawing school. These classes are open to young men over 16 years of age connected with the trades who desire by the facilities offered in drawing to gain a better knowledge of their particular trade. The necessary application blanks can be obtained from any member of the committee or on application at the school. The applications must be filed by September 15.

Is the Corner Turned?

The doleful tale of trade depression and tight money which has been the prevailing topic in business circles for so many weary weeks has at last given place to a more cheerful strain of talk. Dating from the day on which the House of Representatives decreed the repeal of the Silver Purchase law, an improvement in the business situation has been apparent. Reflected at first in an easier money market, the better feeling has been expressed in Wall street by the recovery in the value of almost all securities. In the present week these encouraging signs have continued. The premium on currency has disappeared and money which had been loaned out of town by New York banks during the pinch is now flowing back from the interior. The banks of the financial metropolis have replenished their coffers and are able to supply the needful funds for moving the grain and cotton crops as well as for all the necessities of their customers. Besides these evidences of easier money, reports of financial institutions re-opening their doors for business and of mills and factories starting up again after shut downs of varying duration are now outnumbering the lists of banks and industries suspending or closing down, which had become such miserably monotonous reading a week or two back. The large volume of enforced idle labor is being gradually reduced by the re-opening of works which are constrained to start their wheels again to fill orders coming in. Trade reports, too, speak of increased demand for goods in many lines of manufacture, pointing to returning confidence among consumers.

The Labor Congress.

The great labor congress held in Chicago last week was well attended by "reformers" of more or less eminence from many countries. The symposium of labor theories, however, failed to crystallize into any practical measures for the real benefit of workingmen. There were plenty of so-called economists, with all sorts of schemes guaranteed to usher in the millenium, if they could only be universally adopted, but the trouble with nearly every theory propounded was that existing forms of government or existing institutions of society would have to be completely overturned first. A profound truth was uttered by Bishop Fallows of Chicago, when he asserted that in this country there is no class and no distinction between classes and masses, but the trouble is that his hearers have been educated or have educated themselves to think otherwise, and he probably made no impression on them. They regard workingmen as a distinct class and think that it is possible to do something to better their condition in the lump. The great fact is ignored that every man must work out his own salvation. If he would rise, he must simply work and save.

International Sanitation.

Some important points of international sanitary procedure which were agreed to by representatives of the principal European powers at the recent Sanitary Congress in Dresden are worthy of note as showing that the modern scientific tendency in the matter of quarantine regulations and general sanitary law is not to hamper commerce and travel by the imposition of unnecessary and vexatious restrictions, but to apply sanitary precautions intelligently, in accordance with proved facts in regard to the spread and prevention of contagious and infectious diseases. Only such restrictions as are indispensable for the public safety should, it is believed, be enforced. The congress referred to was held with the view of arriving at some uniform system of sanitary procedure, and their deliberations have resulted, among other things, in an agreement on two prominent points. First, that in the case of infected ships persons on board and still in health should be detained not more than five days after the occurrence of the last case of cholera, and that vessels should be judged by their actual sanitary condition, not by the condition of the ports from which they sailed. It was also settled that rags, in the form of merchandise, have never conveyed cholera, and that shoddy and certain suspected German wools are not carriers of infection. Coming from a representative gathering of leading scientists these opinions must be held to be weighty. It is noticeable that all the more enlightened nations have joined forces in the matter—namely, Austria-Hungary, Belgium, France. Germany, Great Britain, Italy, the Netherlands, Russia and Switzerland, while Denmark, Sweden and Norway are believed to be on the point of joining in the agreement. The dissentients were Greece, Turkey, Spain and Portugal.

A Compulsory Reform.

This country is approaching slowly, but surely, a period when present modes of living among those who sustain themselves by manual labor must undergo reform. The effort to imitate, as far as their means will allow, the dress and style of those possessing more ample means, will be abandoned from the sheer impossibility of maintaining it. The result will be complete relief from many burdens now carried with anxiety and toil, and a lighter, happier lot than now falls to the share of most people who gain their bread by sweat of brow. The struggle to follow the lead of fashion and to obliterate external indications of difference in wealth falls, by its very nature, wholly upon the poorer classes. In such a struggle they exhaust resources that could otherwise be husbanded for hard times like the present; and do what they may in such a struggle, there always remains the unpleasant consciousness of defeat. Before the working population of any land can emancipate themselves from the slavery of poverty they must first break the shackles of false and foolish pride, and recover that true pride which only renders them ambitious to rank first among those in their own station—pride of citizenship, pride of superiority in their chosen handicraft, pride in a manly independence as admirable in a peasant as it is in a king.

The World's Fair Buildings.

How to dispose of the World's Fair buildings in Jackson Park without paying for their removal is just now beginning to trouble the exposition management, and Director of Works Burnham has been ordered to estimate the salvage value of every iron girder and stick of timber in the buildings. It

appears almost incredible that the main exhibit buildings alone, which, according to Auditor Ackerman's July monthly report, have cost $7,019,205, should be without value at the close of the exposition. At one time it was thought by the directors there would be a reasonable amount of salvage, but the estimates gradually dwindled to $1,000,000. That was low indeed, but some of the directors now say they will be lucky if they do not have to pay for the removal, including the gift of the material of the $7,000,000 group of structures. The Administration Building, for instance, has cost $463,212, and now it is estimated that it would be worth the donation of the entire building and a fee of $10,000 in addition to remove it and leave the ground in the condition stipulated by the South Park Commissioners, from whom Jackson Park was leased. Manufactures Building cost $1,172,431. Its stupendous iron trusses, 250 feet high, do not seem to be in demand. Agricultural Building represents $659,234, but nobody wants it. The same is true of other structures, for not a single offer to purchase has yet been tendered. The same conditions existed, however, at the close of the Centennial. There was no immediate demand for the structural material, but the contractors who were able to purchase it and hold it found opportunities to work it off at a good profit. Centennial buildings were reproduced in whole or in part in widely scattered sections of the country.

New Tin-Plate Decision.

The long-delayed statistics of the tin-plate production in the United States for the quarter ending March 31, 1893, have finally been made public, showing that the three months' product was about 30,000,000 pounds, of which some 40 per cent. were made from American black plates. The production for the June quarter is estimated at 35,000,000 pounds, making the total production for the fiscal year equal to 100,000,000 pounds. The Treasury Department at the same time promulgates an important decision, which we print in another column, affecting the statistics of the industry. As we mentioned recently in these columns, the former Secretary of the Treasury decided that plates coated in this country, irrespective of their place of original manufacture, should be classified as American tin plates. This decision has been under careful consideration by the present administration, and the result of their investigations is to reverse the decision and hold that tin plates made from imported black plates are not produced in the United States within the meaning of the Tariff act of 1890. According to the latest figures this will reduce the American production over one-half, and will render it more difficult to bring the domestic product up to one-third of the imported quantity as required by the law if the present duty is to be continued after 1897.

Impending Scarcity But no Boom

The disordered state of trade through which we are now passing is leading to some peculiar results that are worth noting. Branches of business in which stocks are periodically accumulated to meet heavy demands, according to the season, will be seriously disorganized by the heavy curtailment in production which has been forced alike on the establishments with abundant capital and those with but slender resources. The shrinkage of output as compared with normal periods has been enormous. In the stove trade, for instance, those who have the best facilities for gathering information estimate that in July and August about three-fourths of the stove producing capacity of the country was inactive. The reduction in output was not less than 10,000 stoves daily, making an aggregate shrinkage of at least 500,000 stoves in the stocks which in ordinary seasons would be in makers' and dealers' hands at this time of the year. The financial stringency struck the stove trade just at the time when makers are driven, endeavoring to accumulate heavy stocks for their period of most active sales. Among makers of agricultural implements the same serious interruption to the business of great establishments has occurred. Manufacturers of hardware have been forced to suspend in the same way, regardless of the necessity of carrying full stocks in their warehouses to meet the certain requirements of jobbers and consumers. Inconvenience is even now experienced in securing full assortments of goods in some lines.

Granting that the purchasing power of the people may be restricted quite considerably, there will be some demand for goods that must be met. Wear and tear and waste go on and consumption never completely stops. The very heavy curtailment in production has been carried by the financial stringency far beyond the limits of a mere trade depression caused by overspeculation or overstocks. This has deranged the whole chain of distribution, so that temporary scarcity of many kinds of commodities seems inevitable. It has already occurred in the sugar trade in many localities. The same influences curtailed production and the accumulation of stocks in that line as all others, and, now that the season of an enlarged consumption of sugar has set in, there is a sudden scarcity. There may be no sugar famine and prices may be kept down as a matter of policy at this time, but considerable inconvenience is experienced and merchants are harassed by the appeals of their customers for more than can be spared if every one is to get a fair share.

The closing of so many rolling mills is already causing trouble among certain classes of consumers. They are unable to get the exact shapes, sizes and lengths they need, and are hindered in construction which they are extremely anxious to push to completion. On this account some complaint is made that mills are being closed for effect and not because of the slack demand. The fact is overlooked that the aggregate of such business is now small and that mills will not start up nor put in special rolls merely to make a few tons. The railroad companies that have deferred purchasing rails for renewals, but must do some repairing of track before winter sets in, are likely to find themselves unable to get rails just when they want them, now that all the rail mills are shutting down, with the prospect of remaining closed until well along in the new year.

It will be strange, indeed, if the restricted output of Lake Superior iron ore this season is not felt by the Northern iron trade before navigation opens next spring. The falling off in shipments from the mines has been so heavy that the stocks of unsold ore at lower lake ports will be very light when winter sets in. The production of pig iron will not be wholly suspended, nor will the demand long continue as light as at present. Stocks will be drawn upon, and before spring not a few furnacemen will be looking for ore and finding none available.

The presentation of such statements as the above might be deemed preliminary to the prediction of a boom in prices, but it is almost certain that there will be none, even if a decided scarcity of commodities and raw materials should be perceived on all sides. Consumers are not and will not for a long time be in a position to pay a premium on their purchases. They will expect to buy at low prices or they will go without the article needed. Scarcity is not the only requirement for a boom. There must at the same time be an easy financial condition and a fair degree of confidence in the future. These elements are lacking now and are not likely to be of very rapid growth. It will take longer than a few months to get back to where we were even in the uneasy times of last April and May.

A novelty in postal cards is about to be introduced in France. The cards will be issued in the form of check books, with stubs. The sender of the postal card can make memoranda of its contents on the stub, and can have this stamped at the post office before the card is detached, so that a verified record of the correspondence can be kept.

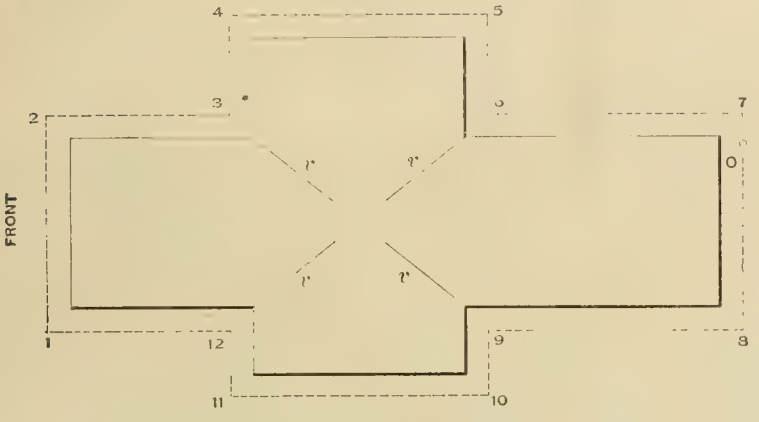
The Thompson-Low Company of New York City were incorporated at Albany on August 31, with a capital stock of $750 to manufacture machinery for the washing of domestic utensils.

Of 365 schools in England built by the Public School Board 230 have been found unhealthy by a sanitary commission lately appointed for their inspection.

ROOFING AND CORNICE.

Roof with Single Leader Pipe.

From N. D., *Portland, Ore.*—I wish to make a few suggestions regarding the gutter with which "D. G.," New Hampton, Iowa, has had some difficulty, as shown in *The Metal Worker* of April 8. The gutter should be almost level for some distance from the starting point and then made to incline toward the outlet, this last half being enlarged if possible. The inside miters, as 3 or 6, should be made rounding or "octagon," as shown in Fig. 2, which would help the flow of water to a considerable extent. In this figure A B C D E F G represents the gutter in plan and J K in profile. By placing the gore piece as indicated by F H E the trough would be wider at the bend. I would suggest that upright pieces of tin or guards be soldered to the bead of gutter at the inside miters 6 and 9. The pieces, as shown in Fig. 3 by L M N, could extend each way from 18 inches to 2 feet and be 2 or 3 inches high at the center M, tapering each way to L and N. If desired the miters at 6 and 9 could be made as indicated in Fig. 2 and provided with guards similar to Fig. 3, being bent so as to conform to the shape shown by G F E D of plan.



Roof with Single Leader Pipe.—Fig. 1.—Plan of Roof.

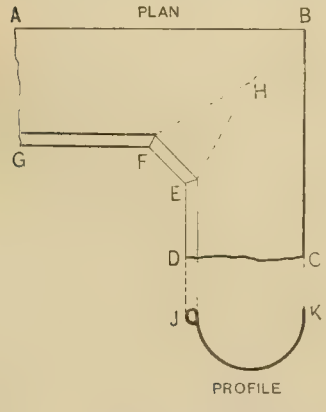


Fig. 2.—Proposed Form of Inside Miter.

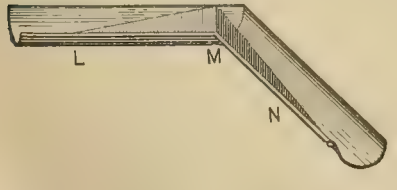
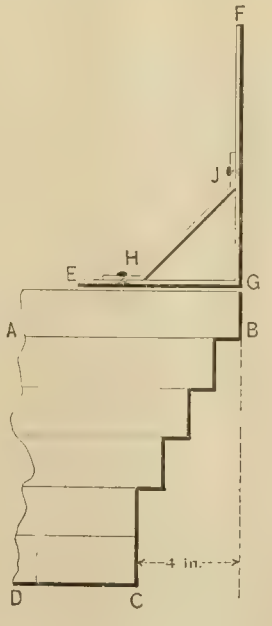


Fig. 3.—Guard for Inside Miter.

Cornice Construction.

From B. C. B., *Brooklyn, N. Y.*—I have a cornice to make in which is a panel having a semicircular top 38 inches wide and 19 inches high. About this panel is to be placed a round bead or pipe. From what material should this pipe be made, and how can it be constructed without raising? The cornice sets on a brick wall having a 4-inch projection, as shown in the accompanying sketch. How should the iron lookouts for cornice be constructed so as to relieve the face of wall from the weight of the cornice?



Cornice Construction.—Sketch Submitted by "B. C. B."

Answer.—It is probable the pipe or bead can be made from galvanized iron or copper, and then bent to the desired shape, directions for which operation are to be found in *The Metal Worker* of April 29, 1893, page 48. The construction of brick wall on which the cornice is to rest is shown in the accompanying engraving by A B C D. The bottom of lookouts can be bent so as to extend back over wall, as indicated by E G F. If greater strength is required, braces similar to H J can be riveted or bolted to the lookouts.

FLASHINGS.

JAMES B. SCOTT & Co., Pittsburgh, Pa., are distributing a special circular relating to their steel roofing. The first paragraph relates to Scott's double-seam roof steel roofing. Then reference is made to corrugated roofing, siding and ceiling, pressed standing-seam roofing and V-crimped roofing. Notes are made of these various products and illustrations are given of their appearance.

IN THE very handsome volume entitled "The Industries of Springfield, Ohio, and Environs," there appear many interesting articles relating to the different manufacturers in that neighborhood. One of the firms to whom particular attention is given is T. B. Peet & Co., manufacturers of galvanized iron cornices, at 28 South Fountain avenue. The firm were established in 1874, and since the death of the senior member have been conducted under the management of Christian A. Schuster, the surviving partner. The products consist of galvanized iron cornices, building fronts, finials, crestings, ventilators and chimney caps, skylights, window and door trimmings and ornamental iron work generally for buildings. The firm make their own designs and drawings, which will be submitted upon application, or they manufacture after architects' plans and specifications. They have done work on many important buildings in Ohio, and are prepared to undertake the largest contracts.

A PRESS DISPATCH of September 6 from Bennington, Vt., states that the slate manufacturers of Granville and vicinity have agreed to shut down all the quarries October 1 for an indefinite period, or until there is a demand for slate.

A corporation with a capital stock of $500,000 was chartered at Trenton, N. J., last week for the purpose of damming the Delaware River near Trenton to secure power for the operation of a large electric plant to supply power to Trenton and Morrisville. The title of the corporation is the Pennsylvania & New Jersey Power Company.

THE LETTER BOX.

Area of Roof.

From H. F. M., *Frankford, Pa.*—Will *The Metal Worker* kindly inform me of the shortest method for obtaining the number of square feet in a roof when inches are involved in the measurements? My way is to reduce feet to inches, multiply, and divide by 144. This is a laborious process, and consumes considerable time when a number of roofs are to be estimated.

Answer.—A convenient method for obtaining the area of a square or rectangular surface is by the use of the duodecimal system, which is the same as the decimal, only 12 units are used in the place of 10. By the use of this system dimensions in feet and inches can be added, subtracted or multiplied, as may be desired, the scale always being 12. The foot is taken as the unit, and can be indicated by ft. or the sign °. The foot being divided into 12 equal parts, one of these parts is called an inch or prime, and marked ′. The inch or prime being divided into 12 equal parts, one of these parts is called a second, and marked ″. The second being divided in a similar manner into 12 equal parts, each part is called a third, and marked ‴. From the above we can form a table of values, which is as follows:

12‴ (thirds) = 1″ (second) or $\frac{1}{12}$ inch.
12″ (seconds) = 1′ (prime) or inch.
12′ (primes) = 1° (degree) or foot.

The marks ′, ″, ‴, which are used to denote the fractional parts of a foot, are called indices. The operation of multiplication by the use of duodecimals is performed as follows: The multiplier is to be written under the multiplicand so that units of similar value shall be under each other. Beginning with the lowest order of units in each, multiply each term of the multiplicand by each term of the multiplier. Each product is to be reduced to higher denominations (by dividing by 12) and written in its proper place. The sum of the partial products will be the product required. To determine under which division two sets of figures come when multiplied together, it is only necessary to add the indices. Thus 1° × 1′ = 1′, 1′ × 1′ = 1″, 1′ × 1″ = 1‴, &c.

Supposing we have a gutter 56 feet and 9 inches long by 14 inches (or 1 foot 2 inches) wide, and we wish to obtain the number of square feet in same. The operation would be performed as follows:

56°	9′	
1°	2′	
9°	5′	6″
56°	9′	
66°	2′	6″

In the above example the multiplier is written under the multiplicand so that units of similar value shall be under each other. Now to perform the above example, 2′ × 9′ = 18″, and 18″ divided by 12 (to reduce to next higher denomination) = 1′ 6″; we put down the 6″ and carry 1′; 2 × 56° = 112′ and + 1 = 113′; 12 goes into 113 9 times and 5 over, so we put down the 9° and 5′ in their proper places.

The next operation is to multiply 56° 9′ by 1°: 9′ × 1° = 9′, which is put under the 5′; 56° × 1° = 56°, which is put under the 9°. By addition we find the sum of the partial products to be 66° 2′ 6″.

Town Sewerage.

From E. G., *Delaware.*—I wish to ask a few questions through *The Metal Worker* in regard to town sewerage. What are the best pipes to use, and which are the cheapest? What is the best way to connect house drains with them?

Note.—Sewers are usually built of brick and cement. When a drain pipe is connected a hole is cut in the sewer and the pipe inserted and carefully cemented tight. Terra-cotta pipes are sometimes used, when there should be a branch for each drain pipe that runs into it, and all joints and connections should be carefully made with good cement. Very frequently, though it is bad practice, a hole is cut in the side of the main pipe and the drain pipe inserted. This is the only way a connection can be made when no branch is provided. Cast-iron pipes possess many advantages and their superiority is recognized by the regulation of many cities requiring that only cast-iron pipe shall be used inside of a building. The connection of cast-iron pipes is made by calking the hub tight with oakum, then pouring in hot lead till the remaining space is full and driving it in tight and spreading it with a calking tool and hammer. It is probable that the first cost of the terra-cotta pipe is less than either cast-iron pipe or a sewer.

Relay or Relief in Pipe Fitting.

From W. J. Y., *Raleigh, N. C.*—In looking over the plans and specifications for a steam heating plant, this clause is found: "Wherever a reducer is used on a line of steam pipe a relay must be put in." The question is, what is a relay? I take it to mean a bleeder or drip pipe to drain the steam pipe of water that would accummulate when the main pipe is graded from the boiler and a reducer is used. Am I right?

Answer.—Our correspondent is right in his conclusion. Bad penmanship might cause the word "relief" to look like "relay," or the person who copied the specification not being a practical man may have used the wrong word.

Plumbago.

To correct the impression given to "E. D. S.," Newman, Cal., in *The Metal Worker*, August 26, further inquiry among the importers and dealers discovers that the value of the best quality of graphite is nearly double the price given, or about 4 cents per pound.

Squared Roofing Tin.

From J. L., *Plymouth, Pa.*—I have read the letter of "W. H. B.," in *The Metal Worker* of September 2, in regard to the turning of edges on roofing plates by the manufacturers. I do not think there would be much advantage gained by it, for this reason: Roofing plates are used in most shops for many purposes besides the laying of flat-seam roofs, and if the edges came already turned it would be frequently necessary to turn them back again or trim them off, causing a waste of time and material. Now, while not recommending the turning of edges on roofing plates, I think it would be a good idea if manufacturers would notch the four corners of the black sheet before tinning. This would not materially injure the sheet for other work, while it would tend to make a better roof. Every tinner knows that when tin is notched the raw edges of the plate are exposed and the slightest dampness causes them to rust, making it very difficult to solder.

Street or Tank Supply.

From W. N. P., *Maine.*—I have several coils to put in furnaces to heat one or two far off rooms with hot water and would like to know whether they would work and do good service if connected with the street supply instead of a tank. Our city pressure is about 100 pounds to the square inch. I presume a tank is better, but what objection, if any, is there to connecting with the street supply.

Note.—There are water heaters in operation giving good results connected with the street supply. When the heating capacity of the coil is somewhat in excess of what is required for the radiators, the hot water is likely to run back in the supply and furnish hot water at some of the cold-water faucets. If the water supply in the street is shut off, as is often done for repairs, the system may be left without a proper supply, unless a check valve is placed to prevent it, but the use of the check valve, however, makes some provision for expansion necessary. The use of a tank is regarded as a remedy for many minor troubles and is quite general.

Boston Plumbers' Paste.

From S. U. B., *New York.*—Please give me the recipe for making paste for use in wiping joints, such as they use in Boston. I don't mean the common paste in general use.

Note.—We cannot supply this demand, but trust to some of our readers in Boston to send in the desired information.

Capacity of Tanks.

From D. C., *Dexter, Maine.*—If "B. B.," Passaic, N. J., whose inquiry appeared in *The Metal Worker* August 19, will paste up in a conspicuous place the following rule for finding the contents of round tanks he will find it to be very handy and correct: Multiply the diameter in inches by the diameter, that by the depth in inches and then by 0.0034. The result will be the exact number of gallons and fractions of gallons. For instance, a tank 20 inches in diameter and 18 inches high would hold 24.48 gallons, which answer is obtained in the following way: $20 \times 20 = 400 \times 18 = 7200 \times 0.0034 = 24.48$.

Heating a Room From Range Boiler.

From J. R. F., *Connecticut, and* J. Q. B., *New Jersey*, we receive letters asking respectively for the best method of heating a bathroom from a water front and if a kitchen boiler can be utilized for heating a bathroom by means of connecting pipes between the boiler and a radiator in the bathroom.

Answer.—To consider the last question first, the answer is yes. To answer the first question, there are some simple rules that must be positively observed and will apply to the average case. It is assumed that the water back and stove have ample reserve power to heat the extra amount of water needed. In cases where the bathroom is directly above the stove it will not be a hard room to heat, and 1 square foot of radiating surface to every 40 or 50 cubic feet of space should prove satisfactory. The radiator must have an air cock at the top to let the air out when water is let into it. As a precaution against getting rusty water into the boiler use lead pipe or preferably ¾ or 1 inch galvanized iron pipe, connecting it with the hot-water service pipe at the top of the boiler and running direct to the radiator. There must be no decline or horizontal runs in this pipe, but a positive inclination upward maintained all the way. This is to let air pass to the radiator and escape through the cock and to provide for an unobstructed flow of water. Another pipe of the same size must be as carefully returned from the radiator to the boiler and connected with the pipe at the bottom of the boiler that runs to the water back. A stop cock should be placed in both the flow and return pipes of the radiator to prevent circulation through them in summer when the heat is not needed.

Water Heater for Cattle.

From O. T. B., *Clinton, Mass.*—Please ask through the Letter Box if there is anything on the market that can be used to burn oil or charcoal for heating water in a tank for cattle; something that can be set in the tank and removed without trouble.

Contaminated Well Water.

From D. C., *Dexter, Maine.*—The trouble with "J. H.," Richmond, Maine, who complains about a well in *The Metal Worker* of August 19, is angle worms. Let him send to Portland, Maine, to W. Winslow & Co., and get 6 feet of 24-inch well pipe, take up the stone work and put the pipe in place of it with the flange end down. Tamp the dirt outside of the pipe as hard as possible. Clean the well, washing in between the stone. By doing this I think he will have no more trouble. It is a good plan to cement out a foot all around where the pipe sets on the stone work.

Making Traps.

From F. H. A., *Pennnsylvania.*—Would you please inform me through the Letter Box how to cut out and put together a 1½ inch P-trap?

Note.—As handicraft is the principal requirement in such work it is difficult to describe, and if any old craftsman can give better instruction than is given here, no doubt it will be appreciated by many readers. Cut out two pieces of sheet lead half as wide as the circumference of the trap and long enough to fill the dimensions required after the bends are made. Form them half round over a piece of pipe and at a point where the throat bend is to be made, press the sides out, and make the throat bend. Then, by continual tapping with a bend pin or piece of round iron, while keeping the bore half round, drive the sides into place. The butt of the trap is made in the same way, and when the work is so far advanced the two parts should be fitted just as if the work was completed before making the next bend. This is one of the jobs that can be learned better by observation than by reading a description of it. After the bends are made and the parts are fitted the soldering is a simple matter. Plenty of solder should, however, be used. Some make a very fair trap by using a rubber pipe bender or a wire spring in a piece of lead pipe, but even in this way of making a trap the tapping and some skill is required. It is needless to point out that all ordinary forms of traps of all ordinary sizes can nowadays be bought of dealers to much better advantage than they can be made in the shop.

Suggestion to Apprentices.

From S. H. B., *Geneva, N. Y.*—Although what I have to say is not about working metals, I think it will be of interest to many of your readers. I have often noticed workmen in the shop with the heels of their shoes worn off at the side or back. If taken to a shoemaker it will cost 25 cents or more to have them fixed, and if not repaired the shoe will soon be ruined. I have seen in some place a kind of heel plate, made of malleable iron, crescent shaped, with projecting prongs on one side to fasten to the shoe heel. If, when a heel is slightly worn, one of these plates is put on it will level it up and prevent further wear. They are very cheap and cost not more than 5 cents a pair and will save at least five times their cost. Would it not be a good plan if the shop boys would order a gross of these, if they cannot find them at the hardware or shoe stores, for it is important that we should economize in these times, when for every dollar that we earn we only get a fraction of its worth in silver, and perhaps have to wait for that.

The Price of Skylight Work.

From R. B., *Ohio.*—I would like to know how skylight work is figured, and what New York firms charge per square foot, as I believe most of them figure by the square foot.

Answer.—The following figures are furnished us by a cornice maker in this city: Skylight work is figured by the square foot, the number of square feet being obtained by multiplying the width of the skylight by its length. For instance, a skylight measuring 5 feet 2 inches in width, by 6 feet in length, would contain 31 square feet. The prices charged per square foot for skylight work in New York differ according to the thickness of glass used, the construction and the workmanship. A flat pitched skylight without ventilator can be made in New York at 65 cents per square foot, for all sizes over 3 feet square, using No. 26 galvanized iron and ¼-inch thick ribbed glass. For flat skylights, 3 feet square and less, 80 cents per square foot. If a ventilator is required on the flat skylights an additional 5 cents per square foot should be added. For hipped skylights without ventilator, using No. 26 galvanized iron and ¼-inch thick ribbed glass, 75 cents per square foot is charged for all sizes over 3 feet square. For hipped skylights 3 feet square in size and less, 90 cents per square foot. If a ridge ventilator is required on the hipped skylight, an additional 5 cents per square foot should be added. When louvres from 20 to 24 inches in hight are required to be placed under the flat or hipped skylights, 60 cents per square foot is added to the foregoing prices.

These prices include finishing the skylights complete at the building and screwing fast to the frame, providing the job is within five miles' radius of the shop; if more than five miles from the shop the loss of time should be added. There are other skylights, known as "turret lights," the sides of which are glazed, and operated to open and close from below by means of worm gearing. The prices of these turret skylights vary from $1.50 to $3 per square foot, according to the number of sashes to be operated and the size of the skylight. The above prices are based according to rates of wages paid in New York—namely, $2.75 to $3 per day, eight hours constituting a day's work—and ¼-inch ribbed glass cut to fit, at 14 cents per square foot. This correspondent will readily understand that if the rates of wages paid in Ohio are higher or lower than in New York, and the hours of labor different, the price per square foot of skylight work would vary accordingly. The best plan to follow in obtaining rates per square foot of skylight work is, having a given size skylight to make, keep a tally of the amount of time and material required on same, and, knowing the rates of wages paid per day and the number of hours constituting a day's work, the rate per square foot can easily be obtained.

Trouble with a Well Cooler.

From P. R. F., *Virginia.*—For the benefit of the readers of *The Metal Worker*, and especially those who have suggested a change of the connections to the well cooler about which I wrote in *The Metal Worker* of July 1, I will give my experience with it. I have taken the boiler out of the well and extended the supply pipe to within about 2 inches of one end and extended the discharge pipe to within 2 inches of the other end, and put in a scattering plate on the end of the supply pipe. It now works to perfection.

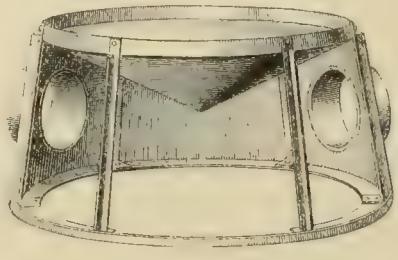
Heating Coil and Radiator.

From H., *East Orange, N. J.*—Will you please inform me through *The Metal Worker* how many square feet of radiating surface will be required to heat two rooms, one 19 x 15 feet, the other 11 x 11 feet, each with ceilings 9 feet high and having 30 and 40 square feet of glass respectively. The room 19 x 15 feet is a back parlor, connected by an opening, but no door, with a front parlor of same size, which contains a register. There is a door between the back parlor and the small room and the intention is to place a radiator in each room. How many square feet of heating surface must be put in a coil or generator to be placed in a hot-air furnace to supply hot water to the radiators for the rooms?

Answer.—So many of the conditions that should be taken into account in answering such a question are missing that a strictly accurate answer cannot be made. There are many rules in use for apportioning radiating surface, the majority of which take into delicate consideration every possible condition and are as cumbersome as they are safe and correct. These could not be used with the information at hand, consequently the rule used is that which requires from 30 to 50 cubic feet of space to be heated by each square foot of radiating surface. This requires judgment in application. If the building is of a character to retain heat and is surrounded by other buildings and the room in question exposes but one wall to the weather, the radiating surface might be safely required to heat the full limit, while if the reverse was the case the small limit might be taxed. Our correspondent must use his judgment in his application, but for example we will use 40 feet, and as there are 2565 cubic feet in the parlor it will require 64 square feet, and there being 1089 cubic feet in the small room it will require 27 square feet, making a total of 91 square feet of radiating surface required for the two rooms. In deciding the amount of surface that will be needed in the heating coil there are as many rules and variations in opinions as in apportioning radiating surface. If the coil is made of 1-inch pipe and is placed in the furnace just above the level of the fire, and where the products of combustion have full effect, the amount of radiating surface that each square foot of the coil will carry varies from 20 to 30 feet, according to different authorities. Some go higher yet, as a 1-inch coil is looked upon as an excellent heater when exposed above a large grate area, as we suppose it would be in this case. As the grate area is not known to us, we shall expect our correspondent to again use his judgment in determining this amount. In order to give an example, we will use 25 feet, which means each square foot of coil surface must heat 25 feet of radiating surface. As there are 91 feet of radiating surface, we find, by dividing it by 25, that there must be 3½ square feet in the coil, and as the piping will lose some heat, it might be well to put 4 square feet of surface in it, or about 12 lineal feet of 1-inch pipe.

Improved Furnace Top

From A. L. BURTIS, *Lockport, N. Y.*—I have been thinking that there is room for improvement in furnace tops, and would like to submit the inclosed



Improved Furnace Top.—Fig. 1.—General View of Top with Side Removed.

sketch, showing what might be done to the manufacturers of furnaces. The business of making furnace fittings by machinery is, in a short time, going to take the place of shop work to a large extent, which will, in my opinion, insure better work in the future than has been done in the past.

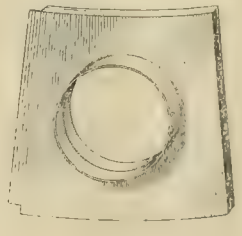


Fig. 2.—Collar Section.

As another step in advance, why could not the furnace top be made as shown in Fig. 1, making a light cast-iron frame, the top being connected to the ring by means of braces all bolted together? Sliding side sections, as shown in Fig. 2, could be made double with an air space, such sections having different sized collars nicely seamed in and provided with dampers. Other sections could be made plain, as shown in Fig. 3, which could be taken to the job if necessary, and collars fitted in as might be required. The cone top would afford ample space for filling with sand, cement or mineral wool, and its shape is such as to deflect the heated air to the various outlets. If desired, a brace or support could extend from the point of cone to the top of furnace dome. The collars could be all put in one angle, the necessary changes in direction being made by means of elbows.

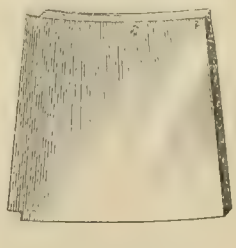


Fig. 3.—Blank Section.

American Tin Plates.

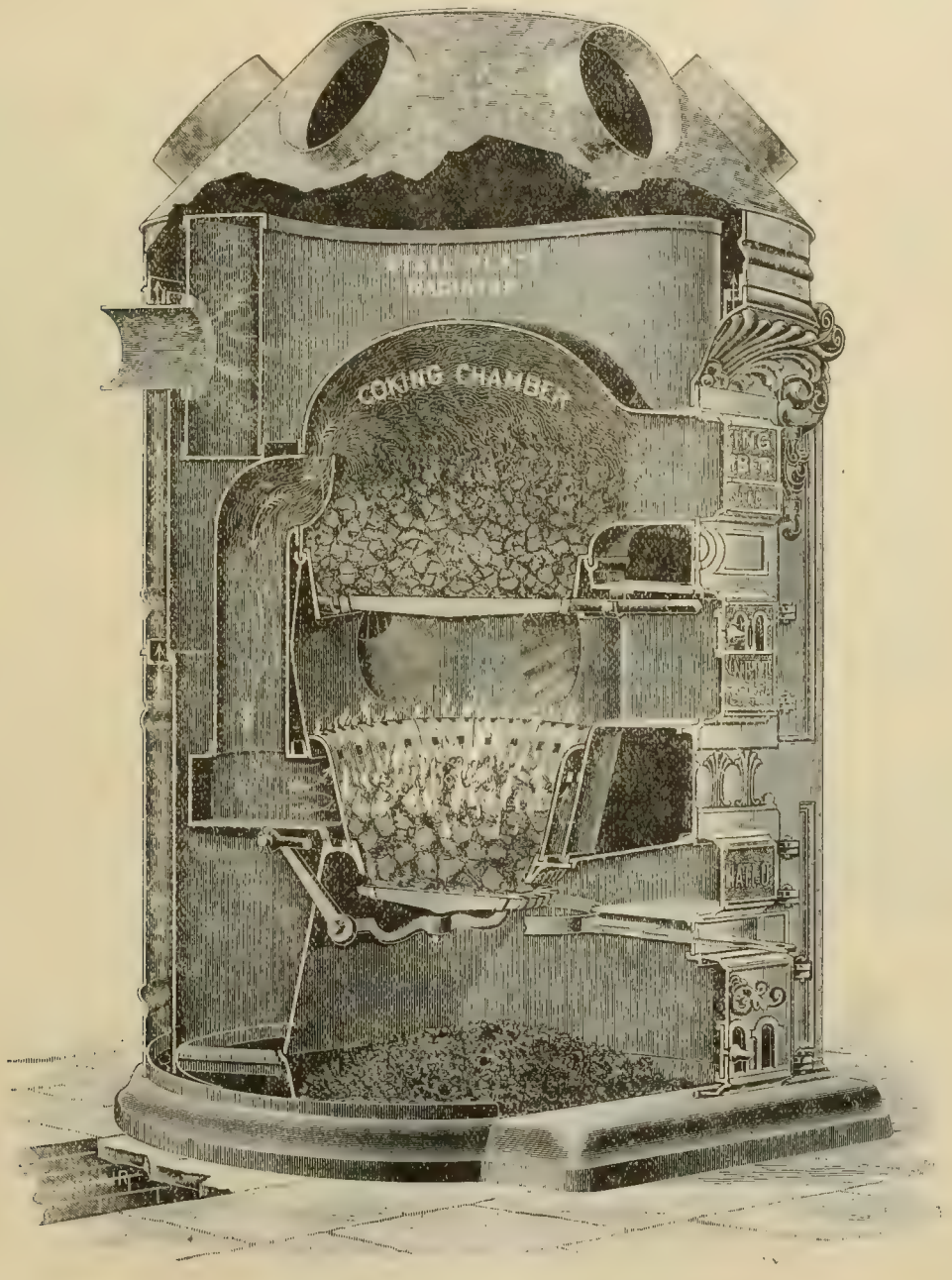
From B. B., *Montgomery, N. Y.*—Inclosed please find samples of IX American bright plates, cut from different sheets in the same box. Please examine them and note the defects. They are badly coated. We sorted the box over and found 35 sheets with a number of bad spots on them, like the samples, which were not fit to make tinware from. We paid a high price for the goods, and while the stock plate seems to be all right, the coating is not even, and in many places there is no coating at all. We like to get home-made goods, but we cannot afford to pay first-class prices for tin and not be able to use 35 sheets in a box, unless we happen to have furnace work to put it into. We hope all the American bright plates are not as bad as the box we have. We should like to hear from tinsmiths through *The Metal Worker* with regard to their experience. Please give it an item in your columns and let the manufacturers know that we must have good tin or we cannot use it.

Note.—We believe in presenting all sides of the question and not concealing anything bearing on the matter of American tin plates. The present letter is an exception, as the general experience with the American product appears to be highly in its favor. The samples inclosed by our correspondent on first inspection did make a very poor impression. The coating down in the corners and along the edges is undoubtedly rough, and at first glance there appeared to be many spots where the coating is entirely absent. Close inspection, however, with a magnifying glass reveals the fact that the principal defect in the plate is the roughness of the coating, and the black spots that at first look like the iron uncoated turned out to be spots of dirt and grease that had collected on the plate and that had been consolidated and hardened, presumably by the rubbing together of the sheets. One of the sheets appeared to be entirely free from uncoated spots, though the tin in the corner had a rough appearance that would unsuit it for bright ware. The other sample, which was apparently uncoated in many places, turned out to have but two uncovered spots where the original iron showed through and gave occasion for rust. The conclusion to be drawn, therefore, from the specimens of plate sent is that the finish is not what it should have been, but with the exception of the two places on one of the samples, where the tin had not taken hold, we did not notice any other radical defects. The result of oil and dust between the plates of tin gives, by rubbing, a very good imitation of a black spot, but it is well to distinguish between them and the actual uncoated portions of a plate.

The Bennett Gas-Consuming Furnace.

A heating and ventilating apparatus involving, it is claimed, a new departure in the use of soft coal as a fuel has been brought out by C. H. Bennett of Cincinnati, Ohio. The maker, however, does not claim that any radically new principles have been discovered, but that long experience and study have resulted in the production of a furnace which combines those principles best known to science, bringing them together in such a form as to produce the greatest economic results at a minimum of cost. It is well known that in using many of the heating furnaces as ordinarily constructed and intended for burning soft coal a large percentage of the heat is lost or wasted. The maker also refers to the fact, not generally known, that a lump of soft coal when placed on a hot fire does not begin to burn until the gas is first distilled or extracted from it, and then if the supply of oxygen is cut off the coal in its incandescent state becomes coke.

By referring to the sectional view of the furnace presented herewith, it will be seen that the heater consists of two principal parts, the upper one being designated as the coking and the lower one as the fire chamber. The soft coal which is employed as a fuel is fed into the lower chamber and the fire started in the usual manner. A similar amount of fuel is also fed into the upper chamber at the same time; the heat from the fire in the lower compartment produces in the coking chamber a perfect coal gas from the fuel there, which, being drawn downward through the gas flue shown at the rear, passes through the circular or square openings located at or near the upper edge of the fire pot, and passes over the live coals, where it becomes ignited. In this way the manufacturer states that all gases and carbon contained in the fuel located in the coking chamber are utilized, the by-product resulting being an excellent grade of coke. This, after the gases have been thoroughly extracted and used in the manner described, is deposited in the lower fire chamber by means of a reversible dumping grate, thus making room for a fresh supply of fuel in the coking chamber. This arrangement also enables the operator to keep the fire in the lower chamber at its greatest heating temperature, and owing to the manner of operating, provides a uniform degree of heat without the loss of time. This is a feature which it is claimed to be impossible to obtain in other forms of construction and one which, it is said, is most important and satisfactory to the user, as when the fire in the lower chamber is at its lowest point and producing a minimum of heat, the live coals in the coking chamber are giving out their greatest heat. Also, when the product of the coking chamber in the form of coke is deposited in the fire chamber below and fresh fuel added to the former, the latter is producing gas but no material heat, while the the replenishing of the fire in the lower chamber with the ignited coke causes it to throw out its maximum quantity of heat. Cold air is admitted to the radiating surface of the furnace and distributed in the usual manner. The maker states that all parts of the Bennett smokeless gas-consuming furnace are simple, easily understood and readily accessible for repairs when necessary. The fire-pot linings are made in sections and can be replaced or removed through the furnace door. All the parts which are most exposed to wear or heat are made extra heavy and all parts of the furnace are interchangeable, so that repairs can be made without delay.

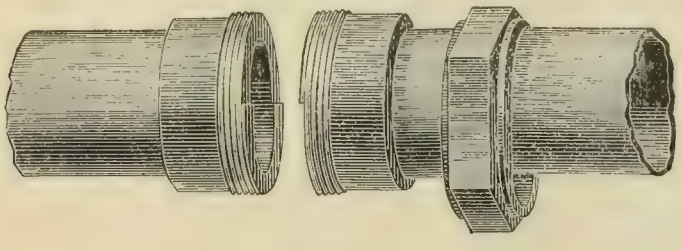


The Bennett Gas-Consuming Furnace.

PLUMBING and GAS FITTING.

Patent Pipe Coupling.

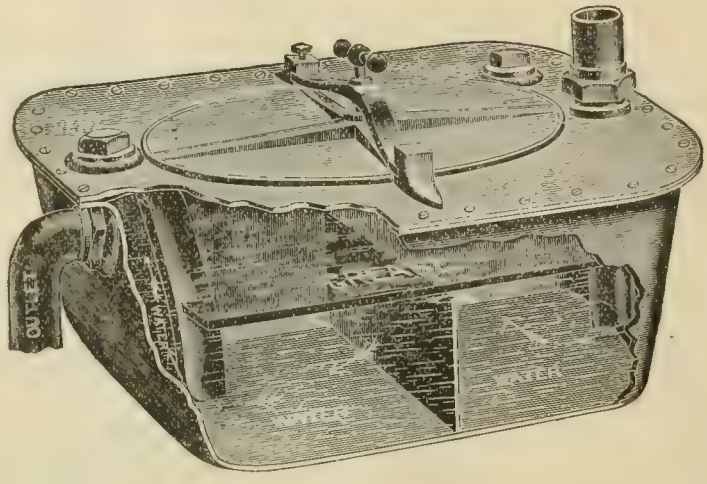
The John Simmons Company, 106–110 Centre street, New York, are putting on the market the patent pipe coupling shown in the illustration. It is simple in construction, consisting of three parts, two of which have a threaded recess at one end to receive the pipe and preserve a smooth waterway through the coupling. At the other end the faces are perfectly smooth to avoid the necessity of packing and are made with a step or offset to aid in their proper adjustment. The external surfaces of these parts are made with a slight taper and are threaded to receive the third part, a hexagonal nut threaded to suit the taper and which when screwed up forces the faces together, making a tight joint. An important feature is that no extra space is required to connect the coupling, as the parts are brought together by a lateral movement. This enables a new piece of pipe to be put in a system without the usual derangement of the whole, which can be appreciated in making repairs. The piping in the upper part of a building may be put in and the plastering and other work finished if this coupling is used for connecting the work put up later. The coupling is the invention of Alexander Bryant and was devised by him for Macdonald & Co., New York, for use in plumbing the Hotel Netherlands, so that it has been practically tested. It is made in six sizes for 2, 2½, 3, 4, 5 and 6 inch pipe.



Patent Pipe Coupling.

The Excelsior Grease and Sewer-Gas Trap.

The illustration shows the Excelsior grease and sewer-gas trap, made by Sproul & McGurrin, Grand Rapids, Mich. It is furnished either enameled or galvanized, and the size now on the market measures 12 x 18 x 10 inches deep. The inlet pipe connects at the top and the outlet pipe at the side of the trap, with a half-circle chamber, that runs down nearly to the bottom of the trap, at each end. Midway between the ends, running crosswise, is a partition that is half the hight of the trap. The greasy water is brought into the trap near the bottom, when it must rise and pass over the partition and down to the bottom of the outlet chamber before it can rise and pass off. This causes the grease to congeal and float on top of the water, and the trap filled with water prevents the escape of sewer gas. The top is bedded in cement to the sides and is provided with a hand hole which has a cover compressed in a rubber gasket, so that the trap is tight and yet is easily cleaned. An opening is provided for a local vent and also for the use of a vent pipe when desired.



The Excelsior Grease and Sewer-Gas Trap.

TRAPS AND VENTS.

PLUMBER W. D. Newton, Bennington, Vt., who sells gasoline, took a light into his cellar to draw some to accommodate a customer and by some being spilled a fire was started that did serious damage before it was stopped. Gasoline is an excellent servant, but exerts its power with disastrous effect when not handled according to certain inviolable rules. It should not be kept where the gas caused by a leak or spilling cannot be blown away and should be drawn at night only when the light is at a considerable distance.

A. J. FULLMER & Co., dealers in plumbers' supplies, 94 Federal street, Camden, N. J., had their safe opened by robbers recently, who secured about $100 for their trouble.

C. H. ROSE, manager of the Old Dominion Mfg. Company, Shendun, Va., is now in New York. This company manufacture such plumbers' goods as tanks, tank boards, water-closet seats, bath and wash tub rims, as well as all metal trimmings required in this line. He now has the business so organized that he will be able to spend a portion of his time in both places instead of being permanently at the works. He speaks encouragingly of the future, and says they have plenty of orders at the factories, which have not only been operated on full time and full force, but have been worked overtime some. Their trade is almost exclusively with jobbers and large dealers. At their New York warehouse, 242 Water Street, they have three lofts each 22 x 80 feet nearly full of goods, with which to promptly execute orders. They estimate in bulk this amounts to about 15 carloads of the larger size.

L. J. HANNIFY, a practical plumber, has been appointed the third member of the Waltham, Mass., Board of Plumbing Examiners, which will organize for business by September 10. W. N. Clifford is chairman of the board, and the other member is F. P. Johnson, the city engineer and an expert on sanitary matters.

THE OFFICERS of the Westfield Heating & Plumbing Company, a newly organized concern, are president, G. B Gaylord; secretary, E. B. Moore, and treasurer, F. C. Gaylord.

JOHN EMIG, manager of the Chicago branch of the Henry Huber Company of New York and Boston, has returned from a three weeks' trip East.

ONE of the leading English medical journals has been discussing the theory that the action of electricity on lead water pipes may induce sufficient impregnation of the water with lead to cause poisoning. Opinions are divided on this question, but the assertion that this may be the case is upheld by a number of scientific men, and the matter is worthy of attention.

A MOVEMENT is being made in Cincinnati to have all the plumbers examined and licenses granted to those who are entitled to them, the idea being to improve the work and prevent future trouble. A committee has been

appointed consisting of Mr. Sterritt, the Health Officer, Building Inspector Toker and Plumbing Inspector Wm. M. Roberts to confer with the Master Plumbers' Association to formulate a plan to accomplish this end.

IT IS WORTHY of commendation that the plumbers and gas fitters of Dallas, Texas, are going to do the work in the Buckner Orphans' Home free of cost. The cynic who looks on every one as seeking some personal gain in the grind of the business mill may cite this as an exception which proves the rule.

THE Examining and Supervising Board of Plumbers and Plumbing at Gloversville, N. Y., consists of Henry Sowle, chairman; T. F. Mullarkey, secretary; E. Brown Baker, treasurer, and F. E. Freeman, inspector of plumbing.

A PROTEST has been made by the Association of Master Plumbers of San Francisco to the Board of Health on the appointment of a new chief plumbing inspector on the ground of lack of qualification for the position. It is probable that the matter will be reconsidered at the next meeting on September 20.

ONE of the finest pieces of work turned out by the Glauber Brass Mfg. Company, Cleveland, Ohio, is the miniature Glauber patent stop and waste cock, handsomely gold plated, that adorns the watch chain of some of their friends as a souvenir. It is modestly stated that it is only an appropriate representative of the goods which the house claim to be of the highest grade.

A. J. DOTY, manager of the Harlem Gas Appliance Exchange, at 125 East 155th street, New York, who made a short call at this office last week, is an expert in gas consumption, whether for lighting, heating or cooking, and possesses a fund of information that is invaluable.

AT SALEM, MASS., the authorities are arranging to comply with the new plumbing law. The Board of Health will select an inspector of plumbing and a member of the Plumbers' Examining Board, who must be a practical plumber, to act with the building inspector and the chairman of the Board of Health, who form the Board of Examiners. These officials will be ready for duty September 10, and will have until December 10 to perfect a set of regulations to govern plumbing work. No one without a license can engage in plumbing work. A fee of $2 is charged for a master plumber's license and 50 cents for a journeyman's license, which will be granted to those who have passed the examination.

The A. Y. McDonald Company

of 168 Lake street, Chicago, and Dubuque, Iowa, have just brought out a very fine catalogue of brass and other goods for plumbers, steam and gas fitters, steam-engine builders, &c. The company have built up a very large trade since their advent in the line of plumbers' and gas and steam fitters' supplies, their most sanguine expectations having been more than realized. In order to properly care for the wants of their increasing trade they have been compelled to largely increase their facilities for the manufacture of brass goods and general supplies, and this handsome catalogue shows what they are now able to present. It consists of 368 pages of illustrated and descriptive matter, covering all styles of bibbs, cocks, faucets and stops, hose nozzles, lawn sprinklers, hose reels, iron bathtubs, sinks, urinals, iron washstands, cast-iron pipe and fittings, iron traps of all styles, hoppers, range boilers, marbled washbasins, earthenware urinals and closets, marble slabs for washstands, stationary washtubs, traps of standard makes, extension service boxes, champion air vents, improved automatic pumps or water elevators, pitcher and force pumps, railing fittings, malleable-iron fittings in great variety, cast-iron fittings, fittings for wrought-iron pipe, branch tees, valves of all patterns for all services, gauges, oil cups and other steam goods, a full line of tools, &c. The company's full line of pumps is shown in a separate catalogue.

Plumbers Failing in Examination.

From A. D. E., *New York*.—I have read the New York State law in regard to plumbing published in *The Metal Worker* September 2. I have a certificate of competency and a license under it. But suppose a plumber fails to pass the examinations, what then?

Note.—This is a legal rather than a trade question, and a legal opinion would probably be more acceptable than ours. The law seems to clearly state that certain requirements must be satisfied if a plumber is to carry on business, and usually when a plumber ignores or defies a law he has to pay the penalty that is inflicted by the court before which he is brought. This question has been discussed by many plumbers and the general opinion is that unless complaint is filed against the plumber who does small jobbing he will not be affected, but those who do larger work will be unable to get permits from the departments. Already this experience has been felt by some who have passed the examination, but failed to take out a license.

The Law Affecting Employing Plumbers.

From J. C. R., *Johnstown, N. Y.*—Does the new plumbing law require men to pass an examination who do plumbing as a branch of their business and hire men to do the work?

Note.—Article 2, section 4 of the new law seems to leave little doubt but all who desire to profit from plumbing work must satisfy the Board of Examiners that they are competent to do such work and then take out a license. The outcome of this provision in its bearing on many cases is being discussed with some interest, the opinion prevailing that it will require a test case to decide the question.

The *Manufacturers' Record* mentions a new use for palmetto leaves, which J. L Cutter of Fort Myers, Lee County, Fla., has converted into a pulp having all the essentials for being made into fine paper. He has had some of this pulp worked up by a manufacturing concern in Boston into pails, tubs, basins and other hollow ware, and it is said to be a great success for this purpose.

The proprietors of the Danville slate quarry, in Canada, are reported to be opening a market for their product among the Saxon school-slate manufacturers in Germany.

HEATING AND PLUMBING.

NEW WORK AND CONTRACTS.

AMONG the contracts for heating recently taken by the Illinois Heating Company, 88 Lake street, Chicago, can be mentioned the following residences in Chicago and vicinity: J. A. Sackley, 1268 Washington boulevard, hot-water heating; Wm. Nobles, 55 Florimond street, steam heating; Wm. Fitzpatrick, 425 South Leavit street, hot water heating; F. Leise, 19 Elaine place, hot-water heating; Fred. Berkholtz, Fifty-fourth street and Kimbark avenue, steam plant to be remodeled; E. R. Converse, Palatine, Ill., hot-water heating; W. H. Winslow, Oak Park, Ill., steam heating.

T. C. BOYD, 40 Dearborn street, Chicago, has the contract for the plumbing in the new Criminal Court building, corner of Michigan street and Dearborn avenue. The floors and wainscoting in toilet rooms will be of marble and all exposed work nickel plated. The Kelly syphon closets and wash basins are to be used.

JOHN W. MILLS, 100 Lake street, Chicago, has on hand three of the largest contracts for hot-water heating in Milwaukee that have been taken in the Northwest lately. Mention has previously been made of the contracts for heating the Sanitorium with 9000 feet of radiation, and St. Joseph's Convent with 11,000 feet. The latest contract is for heating St. Mary's School, for which two No. 25 Bolton boilers and 8000 feet of radiation will be required.

B. E. LEONARD of Scranton, Pa., has been awarded the contract for heating the new Government building now being completed in that city. The steam-heating plants in the Hillside Home, the Delaware, Lackawanna & Western Depot and the Moses Taylor Hospital, were installed by the successful bidder.

AUTHORITY has been given for the expenditure of $1800 to place steam-heating apparatus in the schools in Springfield, Mass.

BIDS will be received by the Supervising Architect, Washington, D. C., until September 14, for the plumbing and contingent work on the United States Court House, Post Office, &c., at Abingdon, Va. Drawings and specifications can be obtained from the Supervising Architect at Washington or from the Superintendent at Abingdon.

A NEW RESTAURANT to be opened in Boston, Mass., by Dennett, is being fitted out with a steam heating plant with a Mahony boiler by E. J. Brody of New York, who is also doing the plumbing.

JOHN INGRAM, Jr., East Stroudsburg, Pa., who represents Louis Waefelaer, 54 Beekman street, New York, has during July and August made the following sales: 21 Ingulf syphon closets for the Somerset hotel, Bernardsville, N. J.; 33 Ingulf syphon closets for the State Normal School, Stroudsburg, Pa.; 10 Ingulf syphon closets for private residences in Stroudsburg, and 26 Rival wash-out closets for the Forest Park Hotel, Bushkill, Pike County, Pa.

W. P. BENNETT, Macon, Ga., has completed an exceptionally fine plumbing job in the Brown House.

AN ORDER has passed the Manchester, N. H., Council authorizing the Lands and Building Committee to procure plans for heating the Ward IX Schoolhouse.

STEAM AND HOT WATER.

The Rex Hot-Water Heaters.

We present in the accompanying cuts illustrations of the Rex hot water heaters, the sectional view, Fig 1, showing the style of the series 313, 315 and 317, while Fig. 2 is a general view of the series 211, 213 and 215. These heaters

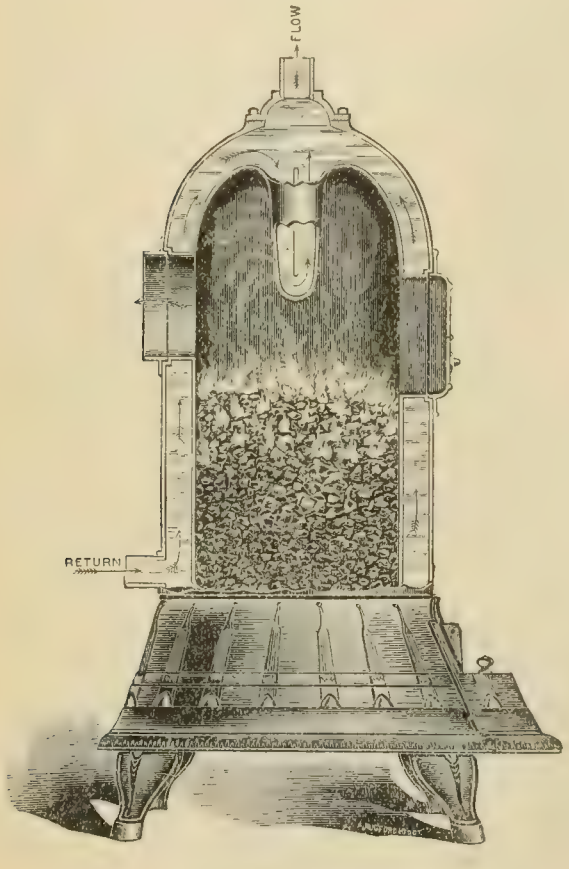


Fig. 1.—Sectional View of Series 313.

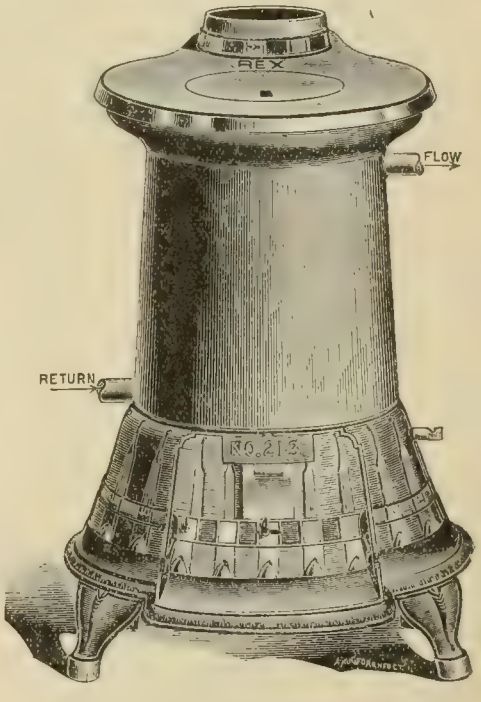


Fig. 2.—General View of Series 213.

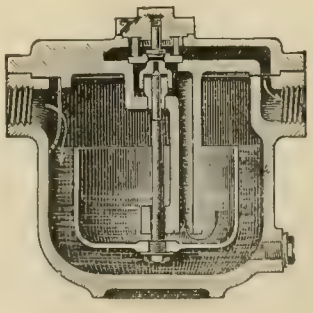
REX HOT-WATER HEATERS.

are put on the market by the Rex Heating Company, Norwich, Conn., and are intended specially for small dwellings, stores, offices, bathrooms, conservatories, poultry and brooder houses, stables, &c. They are fitted with anti-clinker grates, and the casting is in one piece, doing away with all joints. As shown in the sectional illustration, Fig. 1, a water chamber surrounds the fire pot and combustion chamber, while above the fire is a pendant portion with a diaphragm in it, as illustrated. The smaller heaters are made in three sizes, with a diameter of grate of 11, 13 and 15 inches. The larger sizes have diameter of grates of 13, 15 and 17 inches. The latter are adapted to heat from 150 to 300 square feet of radiating surface, or 175 to 350 gallons of water per hour.

THE WOONSOCKET ELECTRIC MACHINE & POWER COMPANY, Woonsocket, R. I., have decided to use steam for heating their new building, after having investigated the merits of electric heating systems, which were found to be desirable, but with the present devices cost was the objectionable feature.

The Acme Steam Trap.

This trap, made by Schaffer & Budenberg of 66 John street, New York, and 22 West Lake street, Chicago, discharges automatically the water of condensation without loss of steam, and also the air that may be contained in the pipes, so that no valve need be provided for that purpose. In this apparatus the open float carries a spindle which closes against a small outlet passage in the main outlet valve when the float is forced upward by the water which has collected in the trap. The main outlet valve is forced upward against its seating by the steam pressure in the hollow part of this valve,



The Acme Steam Trap.

and when the water in the trap overflows into the float and causes the latter to sink, the small valve is first opened, thereby allowing the steam in the cavity of the main valve to escape, so as to relieve it of pressure from below. The valve is consequently fully opened, allowing the water to escape freely until the float has again risen sufficiently to close the valve. The air in the trap is free to escape past the spindle and through the small passage in the main valve. This combination of a small valve and a large one gives the trap the advantage arising from large capacity when compared with others of the same size. All the movable parts of the trap can be easily taken out for examination or cleansing through the small opening in the cover of the trap without removing the entire cover, and the interior parts can all be taken to pieces without disconnecting the trap. It is unnecessary to provide the trap with a check valve in the delivery pipe in cases where the water is forced against a head.

Loss of Heat from Steam Pipes.

From an article in the *Sibley Journal of Engineering*, by Chas. Dunn and W. G. Mack, we reprint the following observations on the loss of heat from plain piping under varying air currents :

The object was to determine the heat losses and to obtain some law governing the heat losses from piping under varying air currents.

We tested two sizes of piping, a 2-inch and 1-inch, 16 feet 1½ inches long, at different steam pressures, with the air in the room as still as possible, in the same manner as the radiators were tested, and found the heat given out per square foot per degree difference between steam and air per hour in B. T. U. was as given in column four in the following tables:

Table No. 1.—Two-inch Piping.

Gauge pressure.	Absolute pressure.	Difference of temperature between steam and air.	B. T. U. given out.
5.50	19.72	155.64	3.307
13 65	27.87	167 10	3.745
27.60	41.76	194 49	4.337
47.05	61 26	213.23	4.518

Table No. 2.—One-Inch Pipe.

Gauge pressure.	Absolute pressure.	Difference in temperature between steam and air.	B. T. U. given out.
5.43	19.49	151.94	5.519
13.43	27.64	165 00	5 658
27.20	41.48	182.45	5.783

We next placed a 10-inch tin pipe around the 2-inch steam pipe. Several tests were made at different pressures, with three or four different velocities of air at each pressure, and the B. T. U. given out per hour per degree difference of temperature between steam and air per square foot are given in column four of the following table:

Table No. 3.—Two-inch Pipe with Blower.

Gauge pressure.	Absolute pressure.	Velocity of air. Feet per second.	B. T. U. given out.
4.45	18.63	9.87	6.322
5 09	19.28	8.57	6.370
5.38	19.62	4 396	4.292
5.86	20 05	4 283	4.716
5.27	19.47	6.92	5.458
5 15	19.35	5.57	5.458
12.48	26.67	6.47	5.533
13.70	27.63	6.15	5.194
12.10	26.03	5.78	5.241
12.25	26.18	5.62	5.189
13.73	27.71	3.674	4.528
13.55	27.53	3.319	4.989
25.36	39.46	7.64	5.666
27.10	41.21	7.34	5.909
27.54	41.65	6.29	5.364
28.21	42 32	6.23	5.411
27.10	41.22	3.901	4.196
26.70	40.82	3.567	4 611

By reference to tables of results Nos. 1 and 2, it will be seen that the heat given off per square foot from a 1 inch pipe is a great deal more than from a 2-inch pipe.

Somewhat of an idea can be obtained from these same tables as to what the loss of heat would be where steam is carried any distance through naked steam pipes in the interior of buildings.

From these tables it will be noted that as the steam pressure increases the difference of temperature between steam and air increases, and the number of B. T. U. given off per square foot increases; but it was found from our curves plotted in our theses that as the pressure became higher the heat given off increased in a decreasing ratio and approached a constant quantity at the higher pressures.

It will be seen, by reference to table of results No. 3 that the heat given off per square foot varies almost directly as the velocity of air passing over the pipe.

HEATING NOTES.

A FALL OPENING is what W. M. Mackay, manager of the steam and hot-water department of Hart & Crouse of Utica, N. Y., calls the completion of his office at 236 Water street, New York. Freshly painted in soft shades and with plenty of light, it impresses the visitor cheerfully and shows a No. 10 Royal hot-water boiler and a No. 19 Royal steam boiler to excellent advantage. Having now a pleasant office and sample room, invitation is extended for an inspection of the Royal goods.

THE AMERICAN BOILER COMPANY, Chicago, issue circulars relating to the various goods which they handle. These include the Butz pneumatic temperature regulator, the perfected Duplex automatic air valves, steel expansion tanks and wool felt sectional pipe covering.

ACCORDING to *Kuhlow's Trade Review* the technology of heating and ventilation is in an advanced state of development in Germany, and its achievements are of great variety. The condition of things is ascribed to the fact that for at least 20 years trained engineers have had such matters in hand. Scarcely a single large public building in Germany is now erected without a central system for heating and ventilation, and the number of dwellings and business houses provided with such arrangements is constantly increasing. The exportation of apparatus for heating and ventilation is also on the increase.

IN AN ITEM last week respecting the American Boiler Company, the wording was such as to give the impression that the American Boiler Company did regular contract work. This, however, conveys a wrong impression, as the company sell to steam fitters and have, we understand, absolutely refused to undertake any contract for heating or figure in any way in the risks of heating contracts, as they believe that the boiler business to be made satisfactory should be brought to that point where boilers are sold like other merchandise to steam fitters. Those who are familiar with the methods of the American Boiler Company will not be deceived by the mistake in the item.

THE AMERICAN RADIATOR COMPANY, 111–113 Lake street, Chicago, report an increased correspondence from various parts of Europe regarding the radiators of their manufacture. Two large orders for radiators have just been received from Germany and one from Scandinavia.

WE ARE INDEBTED to the Richardson & Morgan Company, 92 Beekman street, New York, for a pamphlet relating to their steam and hot-water heaters. Since their last catalogue was issued they have introduced many new features in apparatus of this sort, among the new goods being the Cyclone steam boiler, the Cyclone combination hot air and hot-water heating furnace, hot-water stoves, &c. The volume opens with general remarks on steam and hot-water systems of heating, followed by illustrations and descriptions and price-lists of their combination steam boilers. Then comes a notice of Richardson's new Cyclone low-pressure steam-heating boiler, general and sectional views being given. The Cyclone hot-air and hot-water combination furnace is similarly illustrated and described, and at the close attention is given to hot-water stoves of their manufacture. Several blank pages at the end of the book are left for memorandum purposes.

GEO. W. PLASTOW, heating and ventilating engineer, formerly connected with Richardson & Boynton Company's steam and hot-water department, has resigned his position with the American Boiler Company, to take a position with Johnson & Morris, the well-known heating and ventilating contractors.

IMMEDIATELY upon the assignment of F. W. Lamb & Co., prominent steam and hot-water fitters, at 258 and 260 Michigan street, Chicago, the firm called their creditors together and by practically unanimous consent the creditors gave an extension of 15 months to the firm. On the 30th ult. the assignment proceedings were dismissed and the firm resumed business.

THE ILLINOIS ROOFING & SUPPLY COMPANY, 203 Lake street, Chicago, are distributing illustrated circulars calling attention to their goods. One of them gives a fine view of the South Dakota State Building at the World's Fair, which is covered with Gilbertson's Old Method roofing tin, which is accompanied by testimonials and also by references to other brands of roofing tin sold by the company. Another circular shows a house covered with the Perfection lock-seam steel roofing and gives particulars concerning its merits and advantages. A third circular is in the form of a blotting pad, bearing an illustration of the South Dakota Building.

A NOTICE is given to the trade under date of August 31, that the partnership heretofore existing under the style of Burdick & Hewson, West Superior, Wis., is dissolved by mutual consent and the business will hereafter be carried on by A. C. Burdick.

Prize Competitions.

Prize Competition No. 27 (Reopened).

Local Associations of Merchants.

This competition closed July 8, but in view of the exceptionally few replies which have been received from the trade and the importance and practical nature of the subject, we have reopened it, and extend the time up to which responses will be accepted to September 16.

Some points in regard to the subject appeared in the announcement concerning the competition in our issue August 26, and will probably be of service to those who are intending to compete.

The committee to whom the papers in Competition No. 20 were referred have awarded the prizes as follows :

First prize to B. H. ROSE.
Second prize to C. O. F. YOUNGSTROM.
Third prize to C. L. CHALMERS.

The discovery of an oil well at Akron, Ohio, has caused much excitement and speculation in that vicinity.

TIN PLATES.

The Tin-Plate Ruling.

The following is the text of Secretary Carlisle's official letter to Special Agent Ayer, changing the policy of the Department in the computation of tin-plate production under the tariff act of 1893:

TREASURY DEPARTMENT,
OFFICE OF THE SECRETARY,
WASHINGTON, D. C., September 4, 1893.

COL. IRA AYER, Special Agent,
New York, N. Y.

SIR: By this mail will be returned to you the statements of tin-plate manufactures comprising the quarter ending March 31, 1893, which were transmitted by you to this Department in accordance with instructions.

You are informed that after careful consideration of the matter the Department has come to the conclusion that the word "produced," which appears in the second proviso of paragraph 143 of the tariff act of October 1, 1890, was intended by Congress to exclude from the computation of results all tin plates made from imported black plates.

While, for the sake of uniformity in the reports of the fiscal year 1893, you will construct your abstract and report of the last quarter's transactions upon the same assumption as regards black plates as has governed reports of the preceding quarters of the year, you are instructed to prepare an appendix showing the results of the year's domestic production of tin plate, excluding therefrom tin plates made from imported plates, as already explained. You will also report the facts relative to the manufacture of domestic black plates during the last fiscal year. This appendix is to form part of your annual statement of results.

Respectfully yours,
(Signed) JOHN G. CARLISLE,
Secretary U. S.

Secretary Carlisle, speaking of this action, says: "The only thing in it is that a former administration of this Department decided to include foreign plates tinned in the United States as domestic product for computation under the proviso of the act of 1890, and the Department has now reversed that decision, and only tinned black plates of home production will be included in the computation in the future under the limitation period of the present rate of duty. The report for the fiscal year ended June 30, 1893, will be made to comply with this decision." With this view it is proposed to print the report of the last two quarters, together with the required revisory appendix.

The production of tinned plate in the United States July 1, 1892, to March 31, 1893, on American sheets was 34,682 052 pounds, and the amount from imported plates was 39,290,282 pounds, or 73,972,334 pounds in all. The increase of the March over the preceding quarter is stated to be:

	Pounds.
On domestic plates	3,300,000
On imported plates	6,750,000

In the March quarter the production was 29,566,399 pounds, of which 40 per cent. was made from American black plates. The estimate for the June quarter is 35,000,000 pounds. This would give a product of over 100,000,000 pounds for the fiscal year.

A PRESS DISPATCH from Elwood, Ind., states that the works of the American Tin Plate Company at that place are to be at once doubled in manufacturing capacity, affording employment to 700 men.

SCRAP.

DUQUESNE TIN PLATE WORKS, Second avenue, Soho, Pittsburgh, with city office at 715 and 716 Lewis Block, that city, are now in operation and turning out 50 boxes of terne plates daily. The present capacity of the works is double that number, which output will be reached when the plant is put in full operation. The trimming machine in use is one of the Thomas and White pattern, and is said to work very satisfactorily. American rolled black plates are used exclusively, and the firm mention that they find them better to work than foreign plates, owing to the fact that they are not old, as they get them fresh from the mill, while imported plates very often produce a number of wasters on account of the condition in which they arrive after long transit from the other side. The plates at present made at the Duquesne Works are one brand of roofing ternes named Iron City, claimed equal to Worcester grade. The firm expect to manufacture coke plates later, for which they will adopt the name Duquesne. The officers of the Duquesne Tin Plate Works are C. Dreifus, president; J. Wildberg, vice president and manager; L. E. Block, treasurer; and E. Dreifus, secretary.

RECORD MFG. COMPANY, Cincinnati, Ohio, have recently put into service at their tin-plate works the new Record tin-plate cleaning and polishing machine, which they report as working admirably. All their brands of tin plates will be run through this machine. The company's tin-plate plant has been kept running right along in common with the other departments of their factory, and the firm are prepared to fill orders for any of their special productions, including tin plates.

THE CLOSING DOWN of the tin-plate works has thrown more than 7000 men out of employment in South Wales. As the Welsh colliers are, however, reported to be giving up their fight for increased wages and resuming work, the main reason for stoppage—namely, the difficulty of obtaining coal—is in a fair way toward removal, and a resumption of operations in most of the tin-plate works may be expected to follow before long.

WALLACE, BANFIELD & CO., Limited, manufacturers of tin and terne plate, with works at Irondale, Ohio, advise us that they have been running part of their plant for the past three weeks, and during last week it was running to full capacity. Unless additional orders are received, however, it will be necessary to close down again in a short time.

THE Chicago Tin Plate Company have just completed a tin-plate plant at Wentworth avenue and Fortieth street, Chicago, turning out their first product on the 30th ult. They propose to develop their producing capacity to 1000 boxes per week. They purchase the black plates, but intend to add rolling mills in the course of time to make their own plates. The officers of the company are J. E. Jones, president, and W. D. Lewis, vice president. The product of the works is sold by George Nash, 210 Lake street, Chicago.

THE ST LOUIS STAMPING COMPANY'S WORKS, which were started into operation last week, give re-employment to about 1500 workpeople in the city of St. Louis, and the relief has been much appreciated. George W. Neidringhaus, treasurer of the concern, expressed himself on the situation as follows, in an interview recorded in the St. Louis *Republic*: "We have resumed operations after eight weeks of idleness. I do not think we have made a mistake in doing so. We have afforded employment to 1500 people and given them a chance to earn money wherewith to get the necessaries of life. But that is not what I mean when I speak of making no mistake. I mean in a business sense. The situation seems to have improved greatly, and the daily reports from our country customers are very encouraging. The heavy dealers have been living on their stock, and we cannot expect orders from them just now. We have several of our traveling men out on the road now and they are securing numerous orders from small dealers. In fact, the orders are increasing every day. This certainly would indicate that a feeling of confidence is growing, not only in St. Louis, but throughout the country. We were not the first concern to resume business and I am confident that we will not be the last. I understand that the Buck's Stove & Range Company will begin operations during the coming week and this will give employment to 400 or more men. I feel certain that the idle men in the city will soon be given employment in all branches of trade and business. The situation certainly seems to warrant it."

THE CUMBERLAND STEEL AND TIN PLATE WORKS, Cumberland, Md., which have been closed down for three months, resumed work on Thursday with sufficient orders on hand to keep them busy all winter.

A substance known as argentine has been introduced in Germany for making the so-called silver paper which is used instead of tin foil as a packing material. It is a finely divided form of metallic tin, also known as tin dust, is perfectly uniform in grain, of a bright metallic gray tint, and entirely free from crystalline particles. The raw materials for this substance are tin, hydrochloric acid and zinc. The material is made to adhere to ordinary white paper by the use of wax solutions, prepared by secret methods.

The following figures give the length of some of the longest bridges in the world: Tay Bridge, Scotland, 10,700 feet; Victoria, Montreal, 9500; Moerdyk, Holland, 8530; Forth, Scotland, 8300; Poughkeepsie, United States, 7100; Solway, Scotland, 5820; and Cincinnati, United States, 5300 feet.

THE RETAIL STORE.

Acme Well Bucket and Bottom.

Jackes-Evans Mfg. Company, 100-102 South Commercial street, St. Louis, Mo., are introducing bored well-bucket bottoms, in connection with buckets, as illustrated herewith. The bottom consists, as shown in Fig. 1, of wood, in the center of which is a circular hole. The valve is of wood, under which is a piece of leather to which is attached a galvanized iron loop. The valve is prevented from rising more than 1½ inches from the bottom by a straight galvanized piece, fastened to the bottom and passing between the legs of the loop. To renew the leather only two screws have to be removed, making the operation an easy one. The bucket, Fig. 2, is made of one piece of galvanized iron, resulting, it is stated, in a strong and serviceable bucket. These

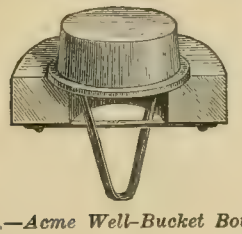


Fig. 1.—Acme Well-Bucket Bottom.

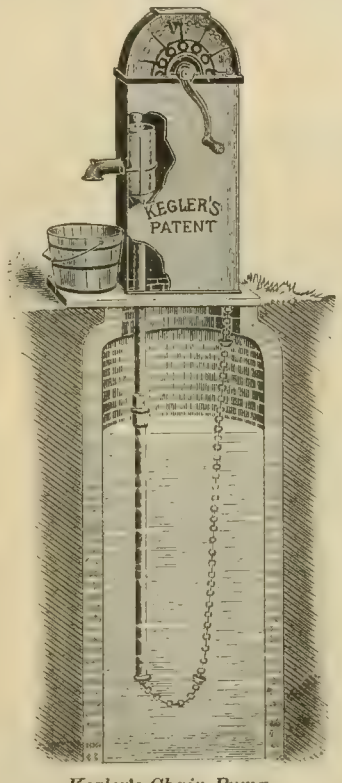
Fig. 2.—Acme Bored Well Bucket.

are made in 3½, 4, 4½, 5, 5½ and 6 inch sizes, each size gauged to hold a pail of water.

Kegler's Chain Pump.

The accompanying illustration represents the above article as put on the market by the Bellevue Pump Company, Bellevue, Iowa. The manufacturers claim that the pump curb, which is all iron, galvanized, has a top or cap, so arranged as to prevent the spattering of the wheel getting outside, or rain water getting inside; that the noiseless fixtures are fastened on the upper rim of the curb by small bolts, which when worn can easily be replaced by new ones; that the curb will not rust, rot nor accumulate filth; that it weighs 10 pounds less than the ordinary wood curb; that it is narrow at the top and wide below to prevent ice accumulating, and that the curb is not easily dented, as the sheet iron is tightly stretched.

The galvanized-iron tubing has a reservoir 3½ inches in diameter at the



Kegler's Chain Pump.

top to prevent waste of water, and the upper section of the pipe is made on a taper to allow a space between the bucket and the inside of the tubing below the frost line, to render it anti-freezing. The tube is connected by couplings with a leather washer to make it water tight and easy to couple. The claims are made that the tubing weighs ½ pound to the foot, and does not become saturated with water; that it is easily taken out and replaced when the cistern is to be cleaned; that it lasts longer than wood tubing and that under porches and under low roofing short pieces connected with couplings may be used.

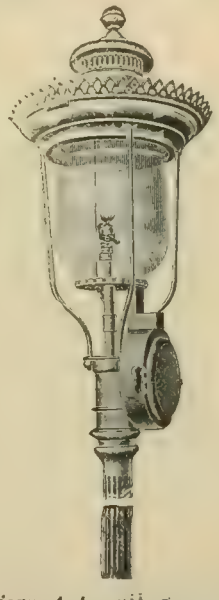
Gray Fruit Picker.

The Cleveland Novelty Company, Cleveland, Ohio, and the Ross & Fuller Association, 33 Chambers street, New York, are introducing the above article, as illustrated herewith. The handle is of hardwood, with a galvanized frame and canvas pocket; the length over all being 11 feet 2 inches. The manufacturers state that with it fruit can be picked in a circle of 26 feet in diameter, without bruising; that the picker is light, inexpensive and a great saver of labor. It is designed for picking oranges, apples, peaches, pears, apricots, plums, &c.

Gray Fruit Picker.

American Automatic Time Lighter.

The American time-lighting device, illustrated herewith, is being introduced by George H. Gregory, 35 Arch street, Boston. The lighter is described as consisting of an eight-day clock movement, inclosed in a box, the piston valve on the self-lighting gas burner



American Automatic Time Lighter.

being controlled by the mechanism in the box. The pilot flame system is employed in the arrangement, with specially designed appliances for protecting the flame from being extinguished. A feature of the device is the piston valve, situated inside the street lamp globe; the valve, it is stated, being selected on account of the evenness of its movement, and because of its being wholly unaffected by atmospheric changes. It is explained that the only attention the lighter requires is a weekly winding of the clock movement, and that it lights the lamp at the required time and extinguishes it at daybreak. The point is made that in this way many times its cost is saved by economy of gas, aside from the expense and trouble of lighting and extinguishing

the light daily by man or boy. The manufacturer claims that the machine can also be used for operating night lights in banks, offices, stores, &c., for controlling electric currents either for power or light, and for any purpose where a movement at any future time is desired.

Lavigne's Peerless Meat Tenderer.

The Lavigne & Scott Mfg. Company, New Haven, Conn., for whom the Frasse Company, 19 Warren street, New York, are agents, are introducing the above article, as illustrated herewith. The

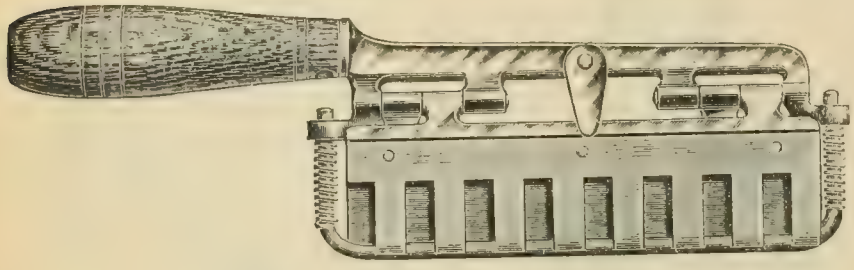


Fig. 1.—Lavigne's Peerless Meat Tenderer.

tenderer consists of toothed blades hinged to a handle frame, the blades being held in place by pieces pivoted to the frame. Between the blades is a heavy wire, with springs at each end, so arranged as to allow the wire to give when a blow is struck. The teeth of one blade are opposite the opening of the other blade, this arrangement being referred to as an advantage in operation. The shank runs through the wood handle and is secured at the end by a nut. By turning the pivoted pieces the blades can be opened for cleaning, as in Fig. 2. The manufacturers claim

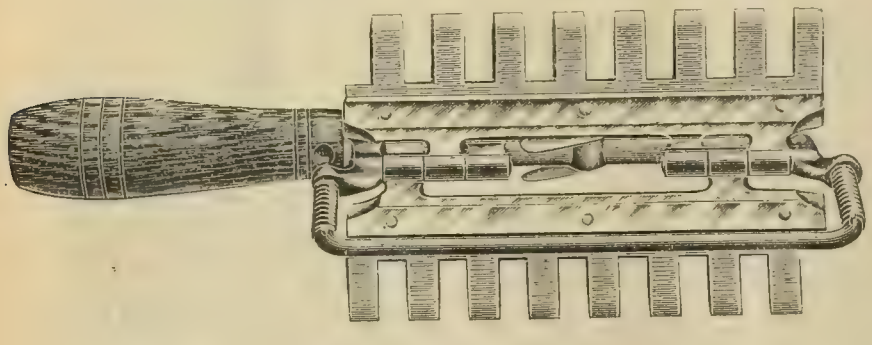


Fig. 2.—Meat Tenderer Open.

that the tenderer is made of the best stock, in the strongest possible manner, and owing to its simplicity cannot get out of order. They are made with bright blades, bright wire and japanned frame, also full nickeled.

Safe Business.

BY T. W. F.

Suppose that three Hardware merchants are doing business with the same amount of capital, under the same expenses, but with different results. A, with a capital of $2500, turns his capital three times during the year, resulting in sales of $7500; with expenses amounting to $1132.50. The expenses may consist of rent, clerk hire, freight, cartage, advertising, light, fuel, insurance, interest on capital at 6 per cent., postage, taxes and sundries, not including bad debts. The goods have been marked to yield a gross profit of 30 per cent., or $2250. After deducting the expenses from the gross profits, $1117.50 remains for personal expenses and clear gain. The ratio of expense to the sales in this case is a fraction over 15 per cent. B, with the same amount of capital also marks his goods to yield a gross profit of 30 per cent., but the capital is turned but two and a half times during the year, resulting in sales of $6250. Deducting $1132.50 for expenses, from $1875, which represents the gross profits, $742.50 remains for personal expenses. The ratio of expense to the sales is here a fraction over 18 per cent.

C, with the same amount of capital, expenses and goods yielding the same percentage of gross profits, turns his capital but twice, showing $5000 as his year's sales. His gross profits are $1500, leaving, after deducting expenses, $367.50 for personal expenses. Here the ratio of expense to the sales is a fraction over 22 per cent. A shows a satisfactory business; B, a business that might be considered satisfactory for a poor year; but C is running his business at a loss, as the average family cannot live on $367.50 a year, and the capital would have to be drawn upon to make up the difference. It will be seen that the percentage of expenses increases as the sales diminish, and that 30 per cent. profit is a fair average at which to mark goods. A business should increase from year to year, and as it increases the expenses may be increased by adding more or better help, better appliances for doing business, &c.; but the expenses should be kept down so as to bear the same ratio to the sales as formerly. In B's business the limits have been reached, both in the amount of expenses and smallness of sales; and to live anything but a hand-to-mouth existence the sales must be increased or the expenses reduced.

The interest on the capital would be a fair amount of increase in capital for the coming year, which a growing business will demand. It is desirable to invest the net gains in some other way than by returning it to the business as increased capital year by year; for should adversity overtake the merchant, outside means would be needed to help him out of trouble or to allow him to gain a new start in life.

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STOVE TRADE NOTES.

The Western Stove Trade.

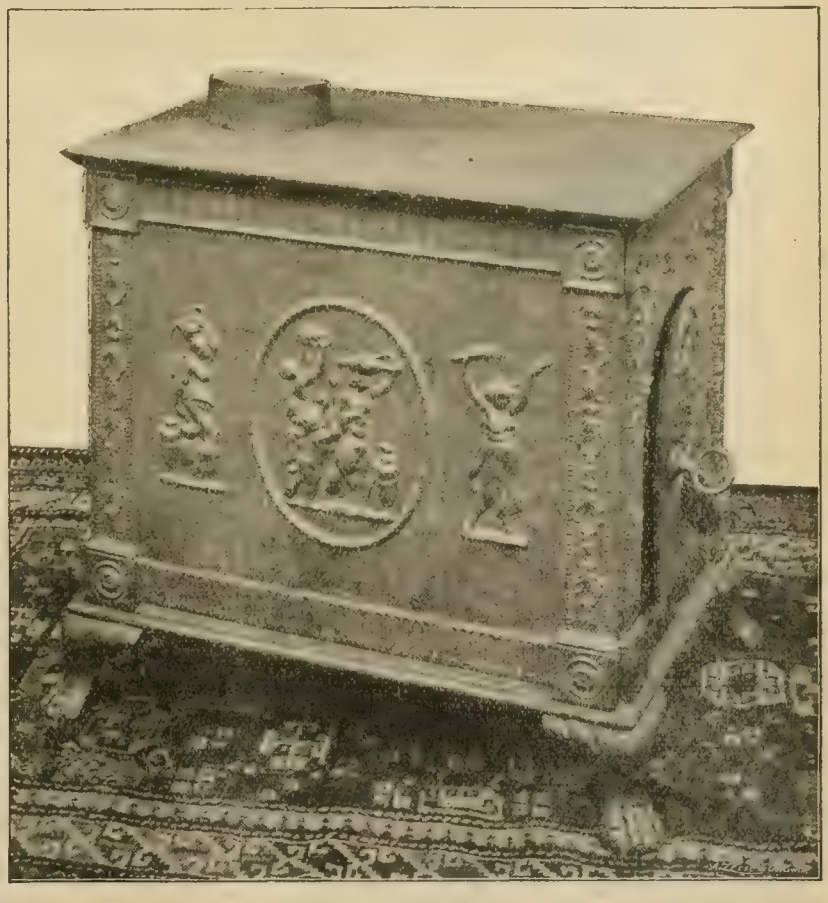
Within the past week or two a distinct revival of business has taken place in the Western stove trade. Up to that time there was but little evidence that this year's fall trade would amount to anything worth considering. Here and there a stove manufacturer reported a continued influx of orders, but such cases were so exceptional that they emphasized the general condition of inactivity. Probably the most of the large makers would have been able to do considerably more than they did if the financial outlook had not been so threatening and consequently the curtailment of credit was deemed wise. The best class of buyers did their own curtailing. During July and August many of them countermanded such orders as they had placed for fall shipment, leaving manufacturers in a state of complete uncertainty as to whether any part of the order would be wanted.

The poor prospects and the scarcity of currency caused stove foundries to be shut down in all parts of the country, as well as in the West. It is estimated by officers of the National Association that fully three-fourths of the stove manufacturing capacity of the country was idle in August. Many foundries were closed for two months. It is estimated that for 50 days the daily output was reduced at least 10,000 stoves. This is a falling off of 500,000 stoves at a time of the year when the foundries are usually very busy preparing for the fall trade. The supply is, therefore, short by that many stoves, and this shortage cannot be made up, although the foundries are rapidly resuming work as the prospect improves. During the past week many orders from the West and Northwest once countermanded have been renewed in part, with some chance that later in the month the balance of the order may be called for. This is due to the good condition of the crops. With the exception of a very few localities, the reports in this respect are excellent. If the wheat crop was short the corn crop will be heavy, or other grains have yielded well to make up the wheat deficit. As farmers get easy financially those who depend on farmers' patronage are benefited.

The only localities which have thus far shown no improvement in the demand are the so-called silver States. The prostration of their mining interests has absolutely cut off all trade, and a revival is not expected this season. Good orders had been entered by large stove manufacturers from buyers in Colorado, Utah, Montana and Idaho, which were countermanded *in toto* in the latter part of July, since which time nothing has been heard from them. The silver State trade is regarded as almost hopelessly lost for 1893, but the loss of this year is expected to be retrieved in the future, when silver is put on a better basis throughout the world.

Manufacturers anticipate a much larger proportion of mail orders this year than usual, owing to the unprecedented interruption to their business in entering advance orders and making early shipments. Even with a reduced volume of business as compared with other years, they are likely to find their facilities severely taxed on account of the curtailment of production in July and August. It will not be surprising if the merchants who defer buying until the last minute find considerable delay in getting their orders filled. This has already happened in the sugar trade, where precisely the same influences were in operation, curtailing business and production. Warehouses are not crowded with great stocks of stoves, as they have been when times were good.

Manufacturers are expressing satisfaction that this great depression in trade did not catch them in a period of inflated values. Their prices were so low that there was no room for any material reduction. There is no shrinkage in the value of their stocks of stoves to be looked for, as in previous times of panic. With the brakes released from the wheels of business everything can go on as before with no interference from such a disturbing influence as a sharp down grade in prices.



An Old Stove.

An Old Stove.

The accompanying illustration is a photo-engraving made of the central feature of the exhibit of the Michigan Stove Company at the World's Fair in Chicago. This they describe as the oldest stove in America and a legend on a framed placard put over it in the exhibit states that the stove was brought from France and placed in the first-established convent in Quebec in 1693. Down in the corner of the placard is the statement "by the courtesy of Mr. Charles F. Gunther."

New Plant of the Scranton Stove Works.

Some weeks since we called attention in these columns to the fact that the Scranton Stove Works had commenced operations in their new plant at Dunmore, Pa., and that all departments would be under full headway in a comparatively short time. We now learn that the plant is running in good shape with the old force all at work and that the company are fully installed in their new quarters. As showing the relative position of the various buildings composing the plant, we present the accompanying diagram, which also indicates the location of the cupola, cinder mills, elevators, stairway, &c. The foundry or casting room measures 196 x 195 feet in size and has the cupola so situated as to be readily accessible from all parts of the room. There is a capacity for 130 men in this department, which is largely in excess of that of the foundry of the old works. The stockyard is just outside this building, close to the cupola, and small cars for carrying the stock are run on the elevator and taken to the cupola, where it is weighed. Next to the foundry is the cleaning shop, measuring 70 x 70 feet. Beyond this is the mounting room, 145 x 200 feet in size, light to which is furnished by means of a monitor 35 x 80 feet in size. In the rear of the mounting shop are the boiler and engine rooms, where are located two 80 horse-power boilers and a 120 horse-power engine. In front of the foundry and cleaning shop are two buildings, one being known as the pattern shop and the other devoted to the storage of patterns. Directly in front of the mounting shop and separated from it by a driveway is a three-story building containing the offices and shipping room. A ground plan of this building is also presented in this connection. This structure measures about 41 x 98 feet and has a shipping platform outside so that goods may be carried directly from it to the cars, which are run up on a switch connecting with the Erie & Wyoming Valley Railroad. The basement of the building is used for storage purposes, while other portions are given up to shipping room, store room, advertising room and general and private offices. The company expect that when every detail is complete their plant will be among the best equipped and arranged in the country.

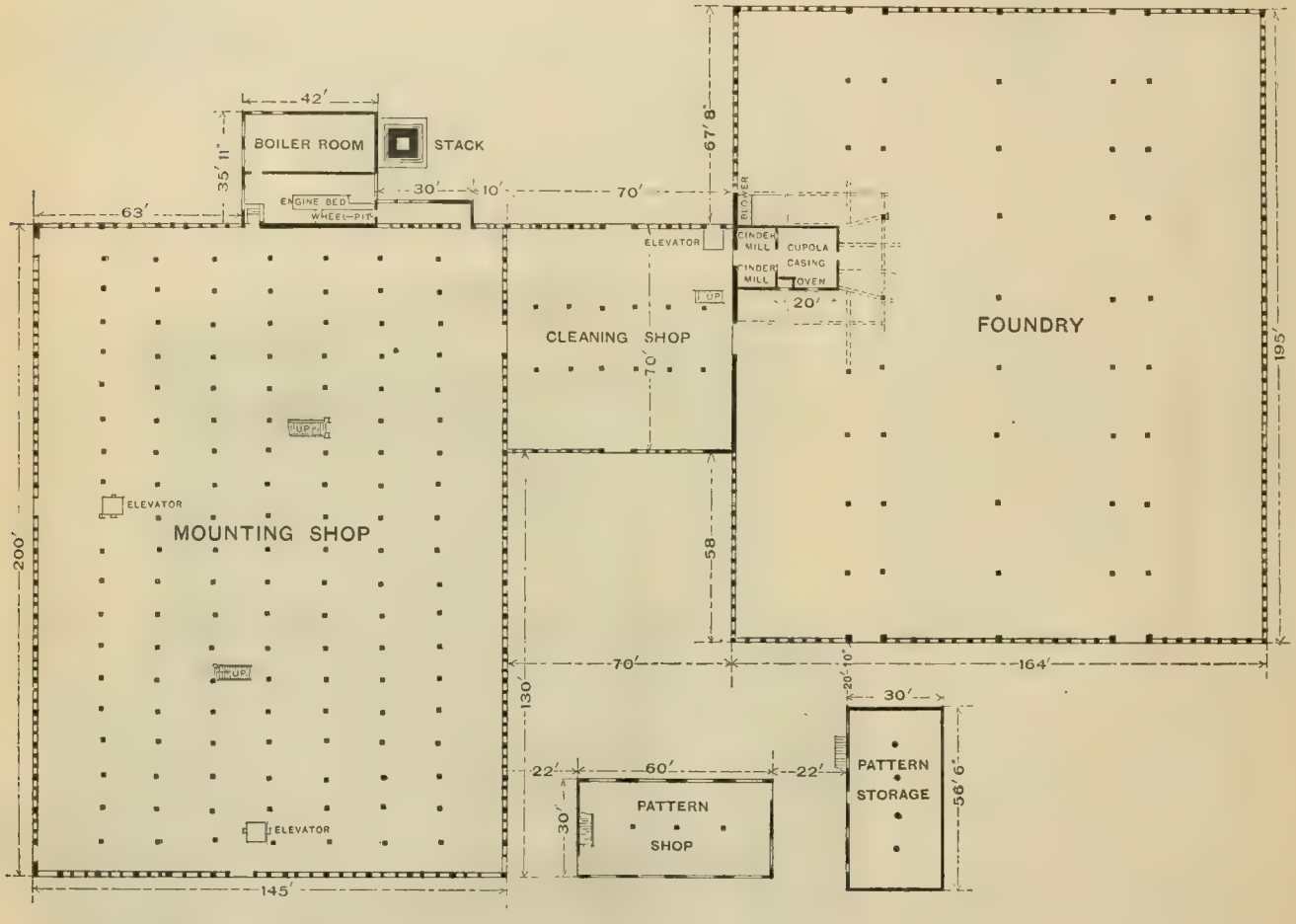


Diagram of New Plant of Scranton Stove Works, at Dunmore, Pa.

The Future of the Hot-Air Furnace.

By A. W. Glessner,

President of the Excelsior Steel Furnace Company.

FURNACE FITTINGS.

For years the steam and hot-water contractor has been an assembler of parts. He has purchased his boiler, pipes, fittings and radiation, together with the necessary valves, gauges and sundries; taken them to the job to be done and installed them, but has performed no portion of the manufacture of the goods or apparatus. On the other hand, the furnace contractor has not alone put in the heating apparatus, but until a comparatively recent period he has produced a very considerable part of the equipment. Up to five years ago all piping, casings, dampers, register boxes, and the tin and sheet iron sundries pertaining to each hot-air job were made by the contractor in his own shop and on hand machinery, and this practice was undoubtedly a very serious obstacle to the progress of the furnace business, inasmuch as every furnace job requires an almost endless number of articles of various sizes, shapes and kinds, especially if the job is properly installed. The knowledge and skill necessary to make the patterns and produce these articles were such, however, as to deter many dealers from handling furnace work, who otherwise would have engaged in the business. But a change, and an important one, has occurred, and the furnace dealer now finds provided for him a line of furnace pipes and fittings, comprising everything needed in furnace work, and can obtain the same from stock as wanted at prices below the cost of hand work. This has been accomplished by means of machinery built for the purpose and which produces pipes and fittings in large quantities at a low cost for labor, and at the same time turning out goods uniform in size and quality. Over 1000 different sizes, shapes and kinds of these goods are made and carried in stock, ready for crating and shipment, and the railroads have made such classifications on these goods as to enable them to be shipped long distances from the points of production.

MACHINE MADE GOODS.

The advent of these machine made fittings has been the direct means of substituting in the furnace work of the

country a certainty for an uncertainty. In every case where hand work is carried on in the furnace business the dealer is at sea on costs. Periodically he times his men when at work on elbows, pipes or stacks, but in another month a different set of men may be in his shop who may be faster or slower than their predecessors, and more or less wasteful of stock, and calculations based on former figures must be revised again and again. Such figures are never reliable, as men are not like machines, and the same man varies in capacity from day to day. Of this I am certain, as I have kept records of the work of men on hand work for a period of weeks, and have been interested in noticing the wide difference in the daily outputs. In hardly one shop in 100 can a foreman tell his employer the cost of the various fittings entering into furnace work, or come within 10 per cent. of that cost. This is unfortunate, for the reason that a dealer knowing the exact cost of an article of his manufacture is in a position to figure intelligently and can undersell his competitor who does not know the exact cost, and must, therefore, figure at a larger margin in order to make himself safe.

Therefore the advent of machine-made fittings, by which the dealer can figure the absolute cost, is a step forward in the business and must have some effect on the future of the hot-air furnace. One of the effects of the general adoption of such fittings would be to place dealers on a parity with one another as regards that portion of their work, and would serve the purpose of concentrating the efforts of dealers on the furnace-setting branch of the business, which would lead to a higher degree of excellence in that department.

CAPACITY OF THE DEALER.

Another effect would be to double the capacity of the dealer during the busy season, as the time consumed in producing these goods by hand more than equals the time necessary for their installation. Furthermore, by having access to the right elbows, angles and bonnets, there is no necessity for poor work on the part of the dealer and no excuse for botch work, such as is too frequently seen in furnace work in small towns.

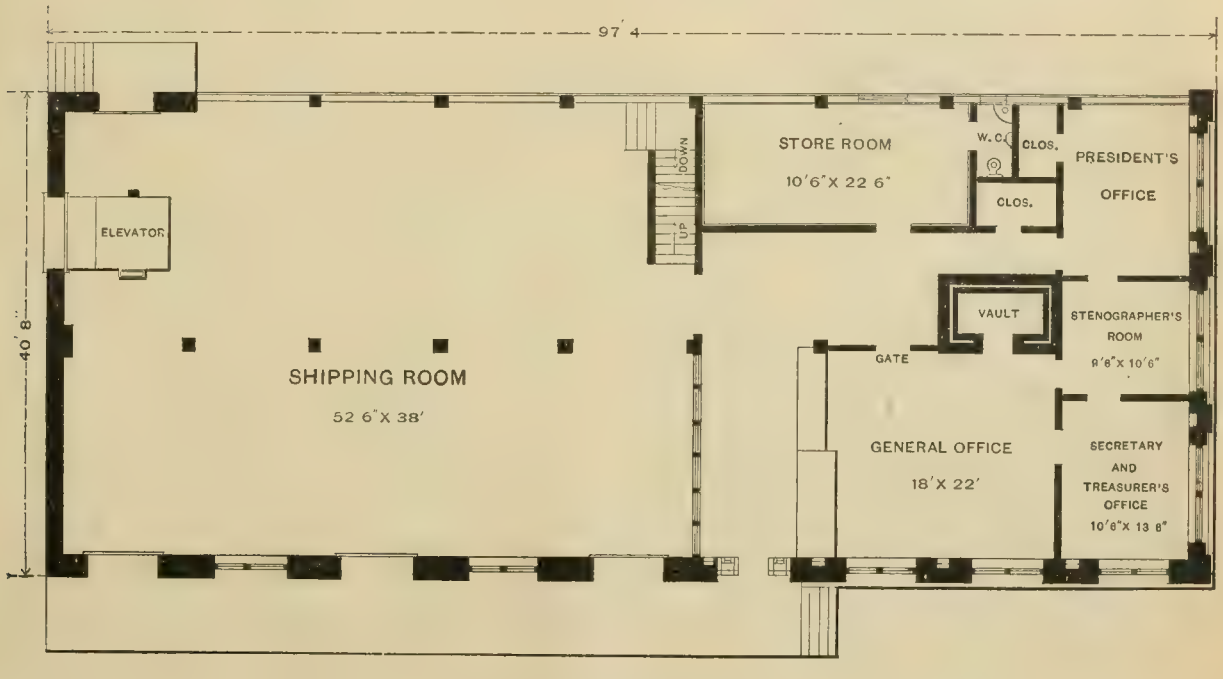
(To be continued.)

The O K Stove & Range Company.

We are indebted to the O K Stove & Range Company of 238 and 240 West Main street, Louisville, Ky., for a copy of their 1893–94 catalogue, illustrating the lines of O K goods. These include wrought-steel and cast-iron ranges, cook stoves and heaters, as well as hollow ware, tinware, granite iron ware, tinners' stock, tin plate, sheet iron, &c. The volume is embraced in 98 pages of letterpress, bound in colored paper covers of neat design. The opening pages are devoted to the Jewel wrought-steel range, made in several sizes and embodying the modern improvements. Following this we find the O K Standard range for coal or wood, and fitted with heavy covers and centers, large fire chamber, heavy coal linings, shaking and dumping grate, capacious ash pan, swing hearth plate and large oven. The O K Sterling, is a four-hole range made in the usual modifications and embodying the latest improvements. Under the name Reliable we find an interesting line of gas ranges, attractively decorated and offered in a number of sizes. In the way of cook stoves we find the O K Jewel, O K Royal, the O K Monarch and Nancy Hanks, all adapted for burning coal or wood, while under such names as O K Pride, O K Cook, the latter being a new construction, Improved Falls City, Golden Rule and Plantation are presented those for burning wood only. The heating stoves occupy the latter half of the catalogue, special attention being given to the new patterns which have been added this season. These include the O K Franklin with mantel top; the O K Oak having extra deep and heavy fire pot, shaking and draw center grate, large ash pan, &c.; the O K Franklin, with oval fire pot, heavy sheet steel back, cast-iron linings, swing hearth with drop down blower, and the O K Star, all of which are neatly decorated, and the company expect for them a large sale. The Imperial Jewel for 1893 occupies the place of honor and is a handsomely treated square parlor stove for hard coal. Under the name Peerless Jewel is offered a companion to the heater just referred to, while the Signet Herald, a self feeding base burner, is a member of the same class. We also notice a line of globe, cannon, laundry and box stoves, as well as price-lists of hollow ware, grates, elbows, &c.

J. P. Lindemann & Sons,

of 827 to 901 St. Paul avenue, Milwaueee, and 105 Lake street, Chicago, have issued an elaborate illustrated catalogue and price-list of the goods handled by them. The book is 6 x 9 inches in size, bound in fine cloth, with gilt side and back titles, and contains 248 pages. The first 162 pages of the contents are devoted to illustrations of the Red Cross line of ranges, cook stoves, heating stoves, hot-water boilers and hot-air furnaces manufactured by the Co-operative Foundry Company of Rochester, N. Y., for whom Lindemann & Sons are Northwestern agents. This line is complete in itself, comprising every style and quality of coal and wood cooking and heating apparatus. The special points of these goods are well brought out. Carton hot-air furnaces are next shown, followed by several pages of illustrations of standard furnace pipe fittings. Next comes the Imperial gas range, which contains many original features patented by the firm, which, they state, have been carefully and exhaustively tested under all possible conditions. The burner is especially referred to as a device of high merit in securing the economical transmission of heat, giving a specified result in cooking or boiling with greatest rapidity and least consumption of gas. Some 40 pages are then devoted to tinware and copper ware, in which the line is stated to be conspicuously



Plan of Offices and Shipping Room.

original in design, being made to a large extent with machinery of the firm's own manufacture. A new assortment is shown of extra heavy copper and IXXX wash boilers. Several pages are devoted to sheet-iron goods, such as stove drums, elbows, coal hods, stove pipe, pans, &c. Then follow miscellaneous goods, such as fire brick, dampers, mica, stove repairs, stove boards, &c. Eight pages are used for a line of gasoline goods, comprising the improved New Idea steel frame gasoline stove, the National Cabinet, high and low Juniors, street lamps, plumbers' and tinners' furnaces, &c. A full telegraphic code is given to facilitate ordering by wire.

John Van.

The death of John Van, which occurred at his home on Euclid avenue, Cincinnati, on September 1, removes from a long and useful career the inventor of the wrought-iron range, and one who labored among the earliest to perfect its usefulness and who contributed largely to its present excellence. His business talent and memory were both remarkable, and the latter contributed not a little to his success. For 20 years he resided at his native city, Montreal, Canada, when he left that country and spent several years in Troy, N. Y., before finally locating in Cincinnati more than a half century ago. Here he took a position with S. H. Burton, afterward Redway & Burton, the veteran manufacturer of stoves. Later he formed the John Van & Sons Company, and from this time the name "Van" and wrought-iron ranges became inseparable through the character of the goods put out by the house and the improvements made in the construction and conveniences which were continually added. Afterward the house became John Van & Co. by the admission of L. E. Zeigle, who in 1884 bought out Mr. Van, and the John Van Range Company was incorporated, which still bears the impress of his genius and still occupies a prominent position in the trade. At the age of 18 he married Miss Marguerite Doutey, who died in 1868, and he afterward married Mrs. Louise Boullet, who died in Paris in 1882. Six children survive him.

The Richardson & Morgan Company.

We have received from the Richardson & Morgan Company of 92 Beekman street, New York, a copy of a catalogue which they have recently issued to the trade showing their line of stoves, ranges, furnaces and combination heaters. It is a volume of nearly 130 pages of letterpress, printed in tinted ink and bound in colored paper covers. The side title is typographical in character, consisting of the name and address of the company with an indication of the line of goods manufactured. The raised letters are of white enamel and appear upon a ground work of deep blue. The goods presented are made under the name "Cyclone," and include a varied assortment. The first portion of the catalogue is given up to furnaces, embracing Richardson's Cyclone, made in portable form and also for brick work; the Tornado, with full revertible flue, tubular radiators, large ash pit and other features of obvious utility; Richardson's Cyclone combination hot-air and hot-water furnace, made in two sizes; Richardson's low-pressure steam heating boiler, patents covering which are now pending, and Richardson's combination steam boiler, together with a line of hot-water stoves for offices, stables, conservatories, greenhouses, &c. The ranges appear under such names as the Duplex, Puritan, New Reliable, Cyclone, New Pilgrim, Century, Diamond and New England, the latter being an elevated-oven range made expressly for private residences. A line of fire-place heaters is also shown, together with laundry stoves, tailors' stoves, &c. The closing pages of the volume are given up to tables showing capacity of hot-air pipes and registers, ground plan of brick work for furnaces, and sectional views showing method of connecting a furnace with cold-air supply from the outside. We also have from the company a 48-page catalogue devoted exclusively to the line of ranges manufactured, while a third catalogue is devoted exclusively to the company's assortment of furnaces.

ODD PLATES.

Townley Stove Company of Terre Haute, Ind., have just issued from the press their eighteenth annual catalogue of cook stoves and heaters, mantels, tiles, &c. The volume is neatly printed and arranged in a manner calculated to invite inspection. It comprises 44 pages, bound in colored paper covers. The first place is given to the Brilliant Eclipse range, made with four boiler holes and intended for burning coal or wood. It embodies the modern features and is decorated in an attractive style. Following this is the Solar Eclipse range, made for soft or hard coal or wood; after which we find the Superb Eclipse, a four-hole cook stove with the modern improvements; the Postal Eclipse, the Prairie Queen, the latter being for wood only; the Yucatan, Prairie City and Indianola. The catalogue also shows a line of vapor stoves which the company handle. The heaters include the Art Homestead, a neat square base heater for soft coal; the Buckeye Homestead, a member of the same class; the Sultan, the Erminie, the Total Eclipse and Royal Eclipse Franklin stoves, the Prairie Oak, the Star Eclipse, Favorite, Vandalia, Mikado and Branshaw, the latter a new box stove made in two sizes. There is also shown the Capitol hot-water heater, the Patric soft coal furnace and an interior view showing a mantel with cabinet and mirror.

The Isbell-Porter Company, 245 Broadway, New York, make a specialty of the machinery used in gas manufacturing plants, but the improved Mackenzie cupola and blower made by them still finds favor among the foundries.

Among the concerns recently incorporated at Albany is the Manhattan Gas Heating Company of New York City, to manufacture heaters for burning gas. The capital stock is $15,000 and the directors are John W. McClellan, Cecil C. Brown, Leonard W. Onion, William M. Reckless of New York City and Samuel J. Ametrano of Brooklyn.

The S. M. Howes Company of 40 and 46 Union street, Boston, Mass., have issued from the press a catalogue of stove, range and furnace repairs, together with a price-list of stove dealers' supplies. The volume is made up of 135 pages of letterpress, bound in colored paper covers, having an eye in the upper back corner for inserting a cord by which to suspend the volume within convenient reach. An interesting feature of the work is found in the opening pages, where are given directions for ordering repairs, a diagram representing a horizontal section of a stove or range fire box, the names of the several parts being designated, a price-list of stove and range linings, and illustrations of four varieties of grates, with directions for ordering. The repairs which can be furnished by the company are indicated by numbers which refer to the diagram of the fire box previously alluded to. The list of stoves is arranged in alphabetical order, after each name being given that of the manufacturer. This list covers something over 50 pages, following which is a price-list of hollow ware, sinks, registers and stove dealers' supplies. A comprehensive index completes the volume.

Among the recent passengers on the Jewel Tally-ho coach which is run by the Detroit Stove Works from their Chicago office to the World's Fair grounds may be mentioned the following: G. H. Schanck and Miss Schanck of Libertyville, Ill.; W. E. Stephens and Mr. McMurray of Honey Grove, Texas; Mr. and Mrs. Henry Kramer, Dayton, Ohio; J. W. Armstrong, South Auburn, Neb; Mr. Martin and Miss Martin, Ackley, Iowa; Mr. and Mrs. Isreal, Miss Gunderson, Miss Cost, J. H. Schlecter, Mr. and Mrs. A. Greenheid, G. Meisenhoelder, H. C. Ambler, Fred. H. Page, F. Sperry and Mr. and Mrs. Eldrege, all of Chicago; J. S. Johnson, Galesburg, Ill.; I. T. Peters and A. L. Bolin, Rockford, Ill.; Ben Robinson, Nevada, Mo.; Mr. and Mrs. H. B. Sahler, Atchison, Kan.; T. T. Sanwick, A. T. Sanwick and Ole C. Olson, Drayton, N. Dak.; Dr. H. H. Herbst and wife, Allentown, Pa.; Mrs. J. F. Schall, Batavia, Ill.; C. B. Halladey, I. S. Betts, Ben McLean, Sidney, Ohio; J. G. Chamberlain and friend, Hawkeye, Iowa; Mrs. J. H. Ford, W. B. Ford, F. C. Ford, Detroit, Mich., and Mr. and Mrs. J. White, Knox, Ind.

A new line of oil heating stoves, called the Plymouth, will be brought out in a few days by the Plymouth Foundry Company of 90 Union street, Boston, and Plymouth, Mass. The new stoves will have Rochester burners with 15-inch flame, and are expected to be very powerful heaters. They are compact in design, and highly ornamented, principally with nickel, weigh 17 pounds, stand 30 inches high, and have reservoir capacity of 1 gallon. They are to be introduced as high-grade stoves, at a moderate price. The Plymouth Foundry Company are running full capacity, turning out their regular line of ranges and parlor stoves. Their plant is situated on the water front, near the historic Plymouth Rock, and just now they are building a sea wall 430 feet in length and filling in, preparatory to erecting additional buildings.

Newton & Co., Albany, N. Y., are distributing a circular bearing an odd design relative to their Iron Stone stove linings. The durability of these goods is suggested by the design, which speaks more forcibly than words.

The North Dighton Co-Operative Stove Company of North Dighton, Mass., are distributing an exceedingly handsome poster designed for hanging up in the store of the dealer. The design is lithographed in bright colors and is entitled "Polly, Whistle." Across the top, printed in deep blue letters, are the names of some of the company's leading ranges, together with the statement that they are the best on

the market. The poster is bound with metal strips at the top and bottom and is arranged with an eye for suspending it upon the wall.

THE DIGHTON FURNACE COMPANY of Taunton, Mass., are the assignees of a patent granted a short time ago to E. A. Mason of that place for an oven door, designed for use in connection with cook stoves or ranges. The invention has reference to that class of stoves in which the doors swing vertically and are opened and closed by means of a kicker so arranged that the fall of the door is eased when the door is swung down or opened, while the rise of the door is aided when it is lifted or closed. The device patented by Mr. Mason is such as to render the operation of the door by means of the kicker more perfect, easy and noiseless without danger of the mechanism becoming inoperative or getting out of repair.

LOGAN P. KENNEDY of Louisville, Ky., has patented a kicker latch for stove or other doors, in which the arrangement of parts is such that the door can be opened by grasping the handle portion of the lever with the hand, then depressing it and pulling the door open. The interest of Mr. Kennedy in the patent has been assigned to the Lithgow Mfg. Company of Louisville, Ky.

"WHAT THE PEOPLE SAY who are Using Howard Heaters" is the suggestive title of a pamphlet of over 100 pages just issued by the Howard Furnace Company of Syracuse, N. Y. The matter contained within the terra-cotta colored paper covers is made up of testimonial letters from some of those who have used the company's goods. These letters come from all sections of the country and indicate in a striking manner the popularity of the Howard heaters. Many of these testimonials, we understand, were received by the company unsolicited, but for the purpose of reference they invited opinions from their customers through the medium of a circular letter, a copy of which is given in the opening pages of the pamphlet.

THE BUSINESS of Hart & Crouse of Utica, N. Y., has grown to such proportions that they find it necessary to increase their manufacturing facilities. To this end they have secured about 20 acres of land in East Utica, the plot having a frontage of 1050 feet on Turner street, and extending from the West Shore Railroad to the Erie Canal. From a local paper we learn that Architect Constable is now preparing plans for new buildings, work upon which will be commenced early in the spring. The foundry will have a capacity for 100 molders and will cover an area of 350 x 60 feet. There will also be a storehouse 300 x 50 feet, together with several other buildings. A switch will connect the works with the railroad, thus giving them excellent shipping facilities.

THE TUTTLE & BAILEY MFG COMPANY of New York and Boston have opened a large branch house at 136 Lake street, Chicago. Their salesroom is 160 x 20 feet, fitted up with shelving and racks from floor to ceiling, in which are kept full stocks of all the styles of registers manufactured by the company for heating and ventilating. In the front part of the store a large wall space has been reserved for the display of patterns of register faces. Here are shown numerous elaborate and ornamental designs in great variety of finishes. It is the intention of the company to carry as complete a stock in their new Chicago warehouse as they do in New York. Their trade in the West is now of such proportions as to make it almost necessary to have such a stock within easy reach of furnacemen. In addition to the salesroom they have an equally large basement well adapted for the storage of reserve stock. E. W. Ogden is manager of this branch.

THE BUCK'S STOVE & RANGE COMPANY, St. Louis, Mo., started their works on Thursday, after a stoppage of several weeks, with a force of 350 men.

THE MICHIGAN STOVE COMPANY are distributing whisk holders among their customers. They are made of tin, decorated in a design of shepherd's plaid, with the Garland trade-mark conspicuous on the front, and are pretty enough to be put up anywhere.

R. S. WOOD, secretary of Fuller & Warren Company, Troy, N. Y., gives as his experience that business continues to improve. Their works were shut down July 1 and started up the latter part of that month. For purposes of comparison, he says for the six months from January 1 to July 1, 1893, their business in amount was 53 per cent. in excess of that for the corresponding period of 1892, while during that time in 1892, at the Troy house alone they had exceeded the previous six months of 1891 (January to July) by over $100,000 in sales. They report an increased trade up to September 1 of this year, although somewhat less than they had anticipated earlier. He thinks there is going to be a satisfactory business. Regarding collections, he says they have been excessively close for some time past and are now. Still, there seems to be an easier feeling since the lower House of Congress took action on the silver question.

WE HAVE RECEIVED from the Detroit Council of Trades and Labor Unions a copy of the "Columbian Labor Day Souvenir and Program," compiled and issued under authority of that body. The pamphlet is made up of nearly 50 pages of letterpress and gives among other things the officers and standing committees of the association referred to; the officers of the Michigan Federation of Labor, together with numerous articles specially contributed for the Labor Day Souvenir touching questions of interest to those engaged in industrial pursuits. Some of the pages at the close are devoted to biographical sketches of prominent Detroit citizens, among the number being Hon H S Pingree, Mayor of the city; Hon. J. Logan Chipman and George H. Barbour.

Buck's Stove & Range Company

of St. Louis, Mo., favor us with a copy of a catalogue relating to the lines of stoves, ranges and heaters which they manufacture. The front cover is embellished with a *fac-simile* of the company's trade-mark printed in silver upon a slate colored background. Underneath the trade-mark is the inscription "The Peacemakers," which Buck's stoves and ranges are claimed to be in the homes of thousands of families. The warranty which the company give with their stoves is to the effect that they will "operate perfectly in the open air using four joints of pipe the same diameter as the pipe collar. Any stove that will work successfully under such conditions cannot fail to operate every time with the ordinary chimney." The opening pages are taken up with a statement of terms, a bird's-eye view of the company's works, showing the new Merchants' Bridge in the distance, a diagram of that portion of the city of St. Louis in which the works are located, showing how to reach them from different points, and an invitation to the trade to visit their establishment. Buck's steel range occupies the place of honor in the catalogue, and is a new line made in six sizes. The stove embodies the modern features and is adapted for hard or soft coal, coke or wood. Several varieties are shown in the volume before us. Following this construction we find a varied assortment of ranges, made under the name Buck's Brilliant and embodying the latest features of construction and decoration. Buck's Fashion range, A series, is a handsome stove made for burning wood only and is said to be built upon well-known principles which insure perfection in operation. Among the cook stoves we find Buck's Brilliant in large variety; Buck's Clipper; Buck's World; Buck's Eclipse and Southern Fame. The company state that Buck's stoves and ranges are so made that by removing a panel plate in the extreme back of the stove or range a square top can be readily converted into any kind of an extension top, or either style extension changed into a plain top. Other goods include Buck's Peerless, a neat high finish range for coal or wood; Buck's Brilliant cook stove, for coal or wood; Buck's Paragon, for soft coal or wood, and Buck's Flora, which has been improved by means of a new dress this season. Buck's Brilliant square base burner and ventilator is offered the trade this season, embracing all the features necessary to make it a powerful heater, while the decorative features are of such a character as to produce brilliant effects. Buck's Blazon is a medium-price base burner, which has been brought out for this season's trade, while Buck's Ideal, Buck's Famous, Buck's Guarantee and Buck's Oak are some of the other goods to which attention is invited. The last-mentioned has been improved for this season and is offered in a neat and attractive dress. Buck's Orion is a new open Franklin stove of rich ornamentation and embodying the modern features. Buck's Utopia is a new cottage parlor stove of handsome design and is made both return flue and direct draft. Buck's Autocrat, Buck's Windsor and Buck's Todd, all for burning wood, are shown, together with a varied assortment of box, cannon and laundry stoves. The catalogue closes with a list of hollow ware, miscellaneous goods and skeleton cuts of a cook stove and heater with the various parts numbered for use by the dealer in ordering repairs. The catalogue is neatly printed on good paper and is substantially bound in flexible covers, having side and back titles.

The East Chicago Foundry, Hammond, Ind., which has been closed for some time, resumed operations on September 6, with a large force of workmen. The prospects for steady running are said to be good.

Steps are being taken to increase the water supply in Paris to a sufficient extent to render the consumption of the foul water of the river Seine unnecessary. The waters of the Avel, a pure mountain stream, are being tapped for this purpose.

WORLD'S FAIR NOTES.

Armstrong Mfg. Company

of Bridgeport, Conn., make a comprehensive exhibit of pipe threading and cutting machinery at Column K 52, Machinery Hall. There are six power machines of various styles and sizes in operation, each having an adjustment with which they can be run by hand. They cut and thread from 1 to 6 inch pipe. The feature of these machines is the fact that the gears run in oil and are thoroughly covered up so as to exclude all cuttings, adding very considerably to the life of the machine. The die is made upon the principle of the company's hand die, with a double taper, and is readily ground on an ordinary grindstone. It is adjustable to difference in fittings by reason of a cam which carries forward the knives to the required position. The cutter is automatic, being fed into the pipe by a star feed. The pipe is held in position by four jaws carried forward on a pair of cog wheels which are adjusted on opposite sides of the pipe. These jaws are hardened and may be replaced at very small cost in case of an accident. The company also exhibit a line of their regular hand machines for threading pipe from ¼ inch up to 4 inches. The hinged pipe vise is a convenient tool in a fitting shop, being instantly opened and closed. Pipe wrenches are another specialty, also three-wheeled pipe cutters. Nipple holders are shown which are intended to hold nipples securely while threads are being cut, and to release the nipples easily without injury to the newly cut threads. The holder is a tube threaded internally at both ends, each holder being thus adapted to two sizes of nipples. A slot runs through the tube lengthwise, in which is a taper key holding a loose plug. The threaded end of a nipple is screwed into the holder until it comes in contact with the plug. The other end of the nipple is then threaded and the key is driven back, which enables the nipples to be withdrawn by hand instead of being ruined by the use of pincers.

The Deming Company

of Salem, Ohio, have two exhibits of pumps and other hydraulic appliances. One is located in Machinery Hall, at Column K, No. 33, and the other in Horticultural Hall, north end, Column U, No. 74. The Machinery Hall exhibit is very extensive and interesting. Occupying a very conspicuous position, the company have availed themselves of the opportunity to catch the attention of the moving crowds by having numerous specimens of their pumps in action. Among these are rotary and double-acting pumps, while hand pumps are invitingly placed so as to tempt passers-by to try them to see how easily they work and the size of the stream they throw. Some of the pumps are fitted with glass cylinders, so as to display the action of the valves. Among the specialties shown in actual use is the hydraulic pump, intended for elevating water by hydraulic pressure, as, for instance, in filling tanks on upper floors when the city pressure is too weak to carry up the flow. In general construction it is similar to a steam pump. Improved hydraulic rams are also shown, with one of them at work elevating water. In addition to an imposing array of all sorts of pumps arranged on the floor, a pyramid has been built with numerous steps for the display of more rows of pumps. At the top of the pyramid is a tank into which streams of water are constantly pouring from the pumps below. Prominent among the samples of pumps shown in the general display are the Keystone non-freezing, double-acting force pump, which throws a continuous stream and is made for hand use or for operating with a wind mill, and the Torrent two-cylinder tank force pump, which throws a barrel a minute and may be used to put out fires or to fill wagon tanks for threshermen and others. The company also show their Little Giant hydraulic pressure test pump with which to determine the pressure strength of boilers, pipes, pump cylinders, &c., having a capacity up to 800 pounds per square inch. The working parts are made entirely of bronze. The exhibit in Horticultural Hall consists of pumps for spraying and other special uses peculiar to gardening. Wm. L. Deming is in charge of the company's exhibits. General Western agents are Henion & Hubbell, 55 and 57 North Clinton street, Chicago.

George H. Eaton & Co.,

10 Mount Washington avenue, Boston, make a very creditable exhibit of power presses and shears for working sheet metal at Column I 48, Machinery Hall. These machines are not shown in operation for lack of space. They comprise No. 2, No. 3, Nos. 4 and 5, No. 7 and No. 29 power presses, which are selected as fairly typical of the machines built by the firm for this class of work, although their complete line is by no means covered. The No. 2 is a small press with a bed opening of 4 x 5 inches, the No. 7 has a bed opening of 9½ x 12 inches and the No. 29 is an embossing press. A No. 31 drawing press is shown, with a 6½-inch opening in the bed and a 3-inch plunger. The screw presses exhibited are No. 4, with a bed opening 6 x 8 inches, and No. 45, of somewhat larger capacity. The shears comprise a No. 3 hand, with a 6-inch blade to cut $\frac{3}{16}$ inch iron, a No. 40 slitting shears and a No. 39 geared power shears, which will cut $\frac{5}{16}$-inch iron. Attached to a neat display board are a large number of specimens of work done on the firm's presses, comprising iron, steel, brass and copper sheet metal, cut in a great variety of patterns, as well as finely embossed designs, shallow and deep stamping, &c.

Dr. Philipp Lenard of Bonn has recently shown the Prussian Academy of Sciences, Berlin, that the rays from the cathode of a Geissler tube, which are capable of causing phosphorescence, can pass through a thin plate of metal, such as a plate of hammered aluminum, $\frac{3}{2500}$ inch thick. The air outside a shutter of this material, although the shutter is quite opaque to ordinary rays of light, glows faintly, with a bluish halo, while the shutter itself appears as if it were somewhat luminous, and bodies capable of being excited to phosphorescence shine when held in proximity to the metal. Coal gas and hydrogen are said to show these results better than ordinary air.

A patent has recently been granted to Charles and August Lindemann, Milwaukee, Wis., for an improvement in the manufacture of sheet metal elbows, relating to that class of elbows made from a series of sections united by circumferential seams. Instead of seaming the sections one after another, the new process is designed to save time and labor by making it possible to assemble at one time all the sections in each elbow and close the seams by successive operations of the machine to which these assembled sections are fed.

The Perfection Drum.

The engraving which we present herewith shows the Perfection drum and represents the device with a portion of the outside shell broken away, indicating the construction of the air and smoke flues. The arrows show the points at which the cold air enters the pipes at the bottom and its discharge at the top. The products of combustion pass around the pipes and heating chamber which forms the central portion of the drum, thus utilizing to the fullest extent the heat generated. The device here shown is manufactured by I. B. Kinne & Son, 208 Nicollet avenue, Minneapolis, Minn., and is claimed to be self-cleaning, does not stop the draft of the stove, can be used with all kinds

The Perfection Drum.

of fuel, is compact, and will heat an upstairs room from the parlor or kitchen stove without additional expense. The tubes in the drum are six in number and measure 2⅜ inches in diameter. The cold air is taken through these into the central heating drum, and discharged at a high temperature through the six tubes of the size mentioned at the top. The device stands 36 inches high, including the legs upon which it is mounted. The 12-inch drum is said to have 2302 square inches of radiation, and the 15-inch drum 3076 square inches of radiation. When "knocked down" for shipping purposes a crate 12 inches square and 38 inches long will contain six of the 12-inch drums. The makers state that a common tinners' mallet and wrench are all the tools necessary for putting the drums together.

Kansas women who serve as police justices appear to deal with the tramp question with the Solomonic wisdom of an Eastern cadi. One tramp was recently sentenced to two baths a day for ten days and hard labor on the stone pile, with the order that he was to be fed if he worked and starved if he shirked.

TRADE REPORT.

The Iron Market.

The most encouraging development during the past week has been the easing of the money market. The premium on currency has virtually disappeared, and it is a fact that commercial paper does occasionally find a buyer. While this does not mean immediate relief to the industrial and mercantile community, it does prove that the turn has come.

Blast-furnace returns indicate the tremendous strain under which the Iron and Steel trades have been. Practically we have come down in three months from a full normal rate of production of 9,000,000 tons per annum to one half that quantity. When it is considered that a blast-furnace plant is not readily closed down as other works, being continuous in its operation, it is fair to assume that the output of our Steel Works and Rolling Mills has shrunken even more. It is this, probably, which accounts for the increase in the stock of Coke Iron, which has taken place chiefly in those sections where the manufactures of Iron and Steel are extensive.

Consumption is undoubtedly still light, but there are indications that it is recovering somewhat. Chicago records a good contract for agricultural implement material and notes a better outlook for architectural work. Philadelphia, too, expects to secure some work in that line, while in New York the Third Avenue Bridge, calling for about 4000 tons of material, will give employment to some hungry mill.

Pig Iron.—In the New York market the event of the week, devoid of any sensational features, however, has been the announcement of a reduction in price by the Thomas Iron Company of 50¢ ℔ ton on Foundry grades, making their tidewater price $14 50 for No. 1x, $13.50 for No. 2x and $12.75 for No. 2 Plain. In taking this action the company desire to protect their trade. As a matter of fact, they follow the market rather than lead it, and are still above the prices at which Iron satisfactory to many consumers has been sold for quite a long time. We quote Northern brands $14 @ $15 for No. 1; $13 @ $14.25 for No. 2 at tidewater. Southern Iron, same delivery, $13.25 @ $14.25 for No. 1; $12.25 @ $13.25 for No. 2; $11.50 @ $12.25 for No. 3; $11.75 @ $12.25 for No. 2 Soft, and $12.25 @ $13 for No. 1 Soft.

The demand for Pig Iron in the Philadelphia district has not yet shown much improvement. Many of the leading consumers—foundrymen particularly—have done very little work since midsummer, consequently have had no necessity for replenishing stocks.

It is expected that things will start up quite lively in a little while, but for the present it is a fact that Pig metal can only be sold in small lots. The scarcity of money and consequent difficulty in payment of labor has caused a temporary suspension of production in many lines until such times as collections could be made. Many of the Schuylkill Valley stove foundries, for instance, have been working but two or three days a week, and some have closed entirely, purely because of financial considerations; and in other departments of business there has been a similar shrinkage in consumption. There is, nevertheless, a great deal of business which will not admit of indefinite postponement, and with any general revival in the demand it would not require much time for prices to stiffen considerably. The stove trade especially ought to pick up; this is usually their busiest season, yet there has been no time for years past when so few goods have been manufactured. The trade may be curtailed somewhat, but it is not all lost, and there may yet be a big demand for Foundry Irons. Meanwhile, however, it must be conceded that the demand is light and prices inclined to droop, especially for cash or for good short time offers. Nominal quotations are about as follows for Philadelphia and near-by points: Say, about $13 @ $13 50 for Plain No. 2, $13 75 @ $14.25 for No. 2x and $14.50 @ $15 for No. 1x.

The Pittsburgh market is reported as being in an extremely unsatisfactory condition, there being very little demand. The mills that are in operation are using material bought some time ago, and as none of them are working up to their full capacity, many of them will not be ready to buy for some time yet. Production has been reduced more than one-half, and yet reports of stocks show that more Iron is being made than is being consumed. It is the impression that it will take considerable time before any material improvement, either in demand or price, will be felt. We quote as follows:

No. 1 Foundry	13 00 @	13.25	cash.
No. 2 Foundry	12.00 @	12.25	"
Charcoal Foundry No. 1	15.00 @	16 00	"
Charcoal Foundry No. 2	14.00 @	15.00	"

Slight symptoms of a revival of business are apparent in the Chicago district. Consumers who have had their Iron held back for quite a long time are now ordering shipments on the contracts. It is further stated that parties who have been trying to buy at very low prices, and were out of the market for some time on that account, are now coming in and paying makers' prices. The volume of business in this way is by no means large as yet, but the prospects are certainly more encouraging. The trade promises to run up to a fair volume during the fall months, and manufacturers are feeling a little more cheerful over the outlook. Quotations are unchanged, but are still subject to the previous remark that concessions are made for prompt cash or immediate delivery.

There has been little if any increase in the volume of business in Pig Iron during the past week in Southern markets, but it may be said that the urgency to sell is less pressing, although low prices would doubtless be still accepted for spot cash and prompt shipment. There is rather more inquiry for forward delivery, but at such low prices that the furnaces refuse to entertain the bids, asking an advance of 50¢ ℔ ton over what the Iron could be bought for with ready money. The production of Pig Iron has been so far reduced that with even a little revival in the demand it is evident that a scarcity of Iron would soon be developed. Quotations are nominally as follows:

Foundry.

Southern Coke, No. 1	$12.75 @ $13.00
Southern Coke No. 2	10.75 @ 11.00
Southern Coke No. 3	10.25 @ 10.50
Ohio Soft Stone Coal, No. 1	15.50 @ 16.00
Ohio Soft Stone Coal, No. 2	14.50 @ 14.75
Lake Superior Coke No. 1	15.00 @ 15.25
Lake Superior Coke No. 2	14.00 @ 14.25
Hanging Rock Charcoal, No. 1	18.50 @ 19.00
Hanging Rock Charcoal, No. 2	17.50 @ 18.00
Tennessee Charcoal, No. 1	14.00 @ 14.25
Tennessee Charcoal, No. 2	13.00 @ 13.25

Car Wheel and Malleable Irons.

Standard Southern Car Wheel	17.75 @ 18.00
Lake Superior Car Wheel and Malleable	17.00 @ 17.25

Metal Market.

Pig Tin.—Good support has been given the market by prominent operators, and, while speculation may fairly be said to be on strictly conservative lines, with carrying forward of old deals from current month to October delivery comprising the main deal, prices have averaged somewhat higher, and it is said that the leading holders seem inclined to put them up to nearly the basis of present cost of importation. Some of the statisticians figure it out that the consumption in this country

during August was quite up to that of the preceding month. They also make it appear that spot stocks have been reduced to 6710 tons, against 9100 tons held on July 1, and in quarters where "bullish" sentiment is most pronounced it is claimed that Europe will be drawn upon for supplies in the near future. They figure it out that only four months' supply remains in first hands in this country and picture a lively experience before the end of the year, with an advance in prices to the parity of cost in London, plus 4¢ ℔ lb duty. During the past few days sales have been made at 19.50¢ @ 19.65¢ for prompt delivery, and 0.20¢ @ 0.30¢ has been paid to carry over September contracts to the following month. Sales were recorded of 10 tons at as high as 20.20¢ for November delivery. For small lots prices remain firm and unchanged at 21½¢ for Banca and 21¢ for Straits Pig.

Copper.—Nothing new has transpired regarding the export movement in Ingot referred to in last week's report, except that official records show heavy shipments recently, including over 1800 tons of Ingot, chiefly to Continental ports, Circumstantial evidence is strong, however, that the business on foreign account latterly has been fully as large, if not heavier, than generally reported, and even more significant is the fact that prices commonly quoted a week ago are now exceptionally low. Thus 9¾¢ would appear to be an exceptionally low quotation on Lake Superior Ingot, while 9½¢ for Electrolytic and 9¼¢ for common casting stock stand as sellers' figures against business at fully ¼¢ less very recently. Home trade demand has improved somewhat, and the combination of export and home trade movement suffices to give the market better tone, not only on private negotiations but on the Metal Exchange, where bearish maneuvering has been quite conspicuous of late. Bids there were raised to 9.65¢ for October and 9 75¢ for November and December deliveries of Lake Superior Ingot. Jobbers report a gratifying movement in the retail consumptive demand since the first of the month, orders and inquiries showing a decided increase in number, although almost entirely for small lots. The outlook from the dealers' point of view is considered more hopeful for a fair fall business. Prices on small lots are inclined to stiffen at the quotations of the past three weeks, namely 11¢ for Lake Ingot, 10½¢ for Ansonia Grade Arizona and 10¢ for Casting.

Sheet Copper.—The improvement in demand for Cornice Copper, noted last week, has continued, although considerably below the usual average for the present season. There appears to be, however, a better feeling among consumers, and as stocks are believed to be unusually low throughout the country, a very fair amount of business is looked for within the next few weeks.

Pig Lead.—The market has been very firm, with the higher level of prices that were established last week fully maintained and a fair business effected. Several round lots of common Western were taken at 3.75¢ and about 150 tons at 3.80¢ @ 3.85¢, the latter being the ruling price at the close. Dealers' price for small lots of American Pig shows $\frac{1}{10}$¢ advance over last week. For larger lots 4¢ ℔ lb is still the ruling rate, the consumptive demand being only moderate.

Lead Pipe and Sheets.—The demand for Manufactured Lead is of a dull and irregular character. Manufacturers will, it is believed, make a new scale of prices for Lead Pipe and Sheet within the next few days, in order to bring them up to a parity with the sharp advance which has taken place lately in the value of Pig.

Spelter.—Sales of 15 or 20 carloads recently have served to stiffen the market considerably, and at present there is little if any ordinary Western stock offering at less than 3.70¢ @ 3.75¢. Carload lots have realized 3.62½¢. Choice brands are held at 4¢ upward.

Sheet Zinc.—The retail demand shows no signs of improvement, there being but little doing in this material. Prices are weak and for small lots the rate per pound is noted ¼¢ lower.

Antimony.—Demand is fair and prices are quite steady. We quote at 11¢ Cookson's and 10½¢ Hallett's, for small lots.

Tin Plates.—The improved demand for Coke Plates for canners' use noted last week has continued during the present week. It is, however, almost wholly for moderate quantities and for spot delivery. Baltimore oyster packers are now coming into the market for this material, and a considerable increase in inquiries from that district has been noted within the past few days. The market for "futures," however, continues as dead as ever, showing that what stock is purchased is only such as is imperatively needed for present requirements. Prices on imported Cokes are somewhat stiffer, due probably to the better demand above mentioned as well as to the material contraction in Welsh production, owing to the shutting down of the majority of the tin-plate works in South Wales and Monmouthshire. In other lines of Tin Plate there has been an increase of sales over last week, and considerably more inquiry since the first of the month. The business done is, however, of a satisfactory nature, in that orders, although for small quantities, are more frequently repeated, and collections are considerably easier. Roofing Plates continue in moderate demand, well distributed. Some good sized orders have recently been shipped to the South, and more business is looked for from that quarter. Stocks are very low in all parts, consequently a fair running demand is considered to be assured for some time; but, with the possibility of tariff changes looming up in the future, it is unlikely that either importers, dealers or retailers will burden themselves with any heavy stocks until it is known what form the changes, if any, will take. Shipments from the other side have been unusually light for the past few weeks, and we understand that American importers are holding down orders to the smallest margin possible. Prices are fairly steady, although concessions on those quoted may be had in many cases for desirable orders and prompt cash. A London cable to *The Iron Age*, dated September 6, reports on the English market as follows: The Tin-Plate market has remained slow. American inquiries have been fair, but there is hardly any demand from 'Frisco or Canada. The closing down of many works fails as yet to stimulate prices. Liverpool quotations are as follows:

IC Charcoal, Alloway grade	12/9 @ 13/3
IC Bessemer Steel, Coke finish	11/6 @ 11/9
IC Siemens " " "	11/9 @ 12/
IC Coke, B V. grade, 14 x 20	@ 11/6
Charcoal Terne, Dean grade	@ 11,6

Sheet Iron.—The demand for Black Sheets shows a slight improvement, but the demand is still exceedingly moderate. Orders for fall delivery, which were placed with the mills earlier in the year, are keeping manufacturers' business in gentle motion, but although the production has been greatly restricted, supplies are considerably larger than the demand. Galvanized Iron continues in good demand and stocks are said to be running quite low. Many of the idle mills may, however, be expected to start up again on any sign of scarcity being apparent, when prices may be advanced, or cost of production be reduced by lowering of wages.

Among recently authorized corporations in Illinois are the following: Rulke Pressure Blower Company, Chicago; capital stock, $1,000,000; incorporators, Peter Hartford, J. L. Hughes and Edgar M. McCauley. The Chicago fire Engine Company, at Chicago; capital stock, $10,000; for manufacture of chemical fire extinguishers and fire department supplies; incorporators, C. D. Stone, W. S. Baker and J. M. Ferguson. Dalton Company, at Chicago; capital stock, $20 000; for the manufacture of heating and plumbing plants; incorporators, John F. Dalton, Peter H. Dalton and Wm. Clamsky. The Choteau Pneumatic Hammer Company, at Chicago; capital stock, $5000; for the manufacture of tools and machinery and for general contracting; incorporators, Frank A. Lapham, Daniel Egan and J. W. Dunthy. Hercules Ice Machine Company, at Aurora; capital stock, $500,000; for the manufacture of machinery and apparatus of all kinds; incorporators, Edward Worcester, W. H. Cottrell and Joseph H. Defrees. This company will be formed to take over the business of the Hercules Iron Works, forced into insolvency by the burning of their cold storage plant at the World's Fair.

Chicago Report.

Scrap.—There is no improvement in the demand, and dealers' buying prices are maintained at the following low range :

	Per net ton.	Per lb
No. 1 Wrought Scrap	$7.00	....
Machinery Cast	6.00	....
Malleable Cast	5.00	....
Stove Plate (free of burnt)	4.00	....
Burnt Iron and Grate Bars	3.50	....
Sheet Iron and Hoops	2.00	....
Plow Steel and Breaking Stock	5.00	....
No. 2, such as Shovels, Hoes, &c.	4.00	....
Old Boilers—whole (Iron)	4 00	....
" (Iron)—cut in single Sheets and Rings	6.00	....
Old Gas-Pipe and Boiler Tubes	5 00	....
Cast Borings	3 00	..
Turnings	4 00	...
Horseshoes	8.00	....
Copper Bottoms	....	5 ¢
Copper Clips and Heavy	....	6 ¢
Heavy Brass	....	5½¢
Light Brass	....	3½¢
Pipe Lead	....	2 1-10¢
Tea Lead	....	2 ¢
Zinc	....	2 ¢
Rubber	....	2 ¢

Anthracite.—Consumers have evidently become convinced that prices will be no lower and they might as well lay in their winter's supply. Trade is therefore more active. Carload lots of 12 net tons or over are quoted as follows:

	Grate.	Egg, Sto. and Ch.
Chicago, Ill	$5.85	$6.10
Milwaukee, Wis	5.85	6.10
Kansas City, Mo	9.05	9.30
Council Bluffs, Iowa	9.05	9.30
Lincoln, Neb	9.20	9.45
Sioux City, Iowa	9.05	9.30
Aberdeen, S. Dak	9.10	9.35
Dubuque, Iowa	7.15	7.40
Madison, Wis	7.35	7.60
St. Paul, Minn	8.35	8.60
Burlington, Iowa	7.35	7 60
Des Moines, Iowa	8.80	9.05
Davenport, Iowa	7.15	7.40
St. Joseph, Mo	9.05	9.30
Leavenworth, Kan	9.05	9.30
Omaha, Neb	9.05	9.30

Colorado Anthracite.

COLORADO FUEL & IRON COMPANY.

Denver	$8.00
Pueblo	8.00
Colorado Springs	8.00
Leadville	8.00
Cheyenne, Wyo	10.00
All points between Denver and Missouri River	9.35

THE WATSON PERFECT COMBUSTION HEATER COMPANY of Toronto, Canada, have one of their new Furnaces on exhibition in Annex D, boiler-room extension of Machinery Hall, at the World's Fair. They claim practically complete combustion, smokeless and odorless, of soft coal. The Furnace is shown in operation. Their advertisement appears elsewhere in this issue.

WALLACE & SONS, 29 Chambers street, New York, are about to send out Catalogue No. 7, fully illustrating the Lamp Fixture, Table and Art Goods department of their business. In its 141 pages will be found full lines of Banquet, Boudoir, Piano, Library, Hall and Table Lamps, in onyx, gold and silver plate, &c.; Dressing and Jardiniere Stands, Chandeliers, Brackets, Spring Extensions, Five o'Clock Teas, Blazers, Tables, Cabinets, Pedestals and Chafing Dishes. There are also Burners, Lamp Trimmers, Extinguishers, Police Lanterns and Plantation Lamps. Facing the title page is a bird's-eye view of their works at Ansonia, Conn. The book is printed on fine paper and for greater convenience doubly indexed.

CONDITION OF THE

Hardware Trade.

REPORTS of improved feeling are being received from different parts of the country, and there is no doubt that with the improvement in the financial condition there is a more hopeful tone in business circles. This is certainly true of the Hardware market, and this feeling is reflected in the reports which are given below from representative houses in the principal centers. The stagnation which characterized the market a few weeks ago is being succeeded by a slight movement, as there is a very perceptible increase in the volume of business. Some of the large jobbing houses who during the past month placed exceedingly few orders, and those only to meet their immediate necessities, are beginning to replenish their stock and purchasing such goods as are needed to complete their assortment and put them in a position to meet the demand which is expected during the next few weeks. They are, however, purchasing very conservatively, with an entire absence of the speculative spirit, preferring to take their chances of higher prices or difficulty in obtaining goods rather than purchase beyond their sure requirements. Traveling representatives of manufacturers and jobbing houses are sending in more frequent and somewhat larger orders, but the trade in general throughout the country are pursuing the conservative course of the wholesale houses referred to above. Manufacturers whose works have been closed are beginning to resume operations, and some who have been working on short time are increasing or preparing to increase their output. Some factories are, however, still closed, having stocks on hand sufficient to meet the present demand and being indisposed to accumulate goods. A feature of the business situation which is exceptionally satisfactory is the extent to which prices have been maintained, as manufacturers generally have refrained from cutting prices with a view to inducing sales. There have, of course, been some exceptions and in special cases some lower prices have been made, but, as a rule, quotations are well maintained and manufacturers are refusing to sell goods at unremunerative prices. There is still much difficulty in making collections, but there is less reason for complaint in this regard than during the past month or two, and the trade are thus receiving the benefit which results from the improved financial condition of the country.

Advices from Chicago.—The volume of business in Shelf Hardware is now denominated fair, having made steady progress toward improvement since the depth of depression was reached early in August. Seasonable goods are most in demand, such as Coal Hods, Stove Boards, Lanterns, Scoop Shovels, &c., but it is found that when merchants make up such orders they usually look over their stock and include small lots of other goods needed for sorting up. Prospects are getting better and travelers, through the Northwest particularly, are more hopeful for a good fall trade than they have been. Heavy Hardware jobbers report their branch of business as running considerably lighter than usual at this season. Carriage and wagon builders are very quiet and the demand from this direction is only for material needed for repairs. Manufacturers' agents are having a fair trade only, but are receiving better orders from jobbers than from retailers. The latter are buying only from hand to mouth and this will throw a great deal of their trade in the coming months to jobbers. Some of the jobbers are anticipating this condition of business and are now laying in better stocks, so as to be able to meet the demand. The long drought has caused a much larger trade than usual in Tire Bolts, so that manufacturers in that branch have had less reason to complain than their colleagues in other lines.

Notes on Prices.

Wire Nails.—The Wire-Nail market has not developed any specially new features during the past week. The mills, generally, are resuming operations, though not to their full capacity. Quotations continue unchanged at $1.50 for carload lots, f.o.b. mill, a price which is pretty firmly maintained, most of the manufacturers not showing a disposition to shade it. The volume of business is small, but some orders, principally to replenish broken stocks, are being sent in. The trade, notwithstanding the possibility of advanced prices as a result of agreement between the manufacturers, are not placing stock orders to any considerable extent, but are limiting their purchases to their immediate requirements. Small lots from store in New York are held at about $1.65.

Advices from Chicago.—Orders for Wire Nails have been more numerous and a little large during the past week, but prices show no improvement. Efforts made by some manufacturers to increase their sales have had a tendency to shake the growing belief in firm prices. The low rates named, it is true, have been for spot cash and immediate shipment, but the market now seems to be settling down again to about $1.50 to $1.55, Chicago. Jobbers are doing a good business at $1.55 to $1.60 from stock.

Cut Nails.—The Cut-Nail market continues steady on a basis of $1.05 for carload lots at mill, with concessions in special cases. The volume of business is moderate, and for the most part confined to small lots to meet the pressing needs of the trade.

Advices from Chicago.—Manufacturers of Cut Steel Nails report a continued flow of small orders, which they think is

indicative of the character of trade to be expected this fall. They are not looking for a much larger volume of business in view of the conditions prevailing in the commercial and financial world. Prices are maintained at $1.20 to $1.25 Chicago, for factory lots. Jobbers are doing a fair local trade, but have little demand from outside buyers and are selling small lots at $1.30 from stock.

Barb Wire.—There has been as yet no considerable increase in the demand and the volume of business is light. Prices are, however, pretty well maintained on a basis of $2.45 to $2 50 for carload lots at mill for Four-Point Galvanized. This figure, however, is shaded in some cases and with perhaps a little more freedom than during the past few weeks. More trade is noted among Barb-Wire manufacturers, but they are not yet in receipt of enough orders to justify the starting of all the idle factories. Prices range from $2 45 to $3.60 for Galvanized Barb Wire, according to quantity and brand. Jobbers report a considerably better trade and more inquiries coming in from other localities which have hitherto not been buying much. They sell small lots from stock at $2 65.

Cary's Box Strap Stretcher.—Cary Mfg. Company, 5–9 Elm street, New York, are offering the trade their Box Strap Stretcher for tightening straps on packing and other cases at 75 cents each, less 33⅓ per cent. discount, when ordered in fair quantities.

Cork Extractor.—The Magic Cork Extractor, manufactured by Magic Introduction Company, 321 Broadway, New York, is sold to the trade at $2 per dozen net, or $22.50 per gross.

Shot.—The following changes in prices of Shot were made on September 6 :

Drop Shot, up to B, 25-pound bag	$1.45
Drop Shot, up to B, 5-pound bag	.35
Drop Shot, B and larger, 25-pound bag	1.70
Drop Shot, B and larger, 5 pound bag.	.40
Buck and Chilled, 25-pound bag	1.70
Buck and Chilled, 5-pound bag	.40
Dust Shot, 25 pound bag	2.00
Dust Shot, 5-pound bag	.45

In lots of 2000 pounds and upward, taken at one time, a discount of 5¢ ℔ bag (25 pounds) and 2½ % will be allowed. Terms : Net, 30 days, or 2 % discount will be allowed for cash remitted within ten days from date of bill. Freight equalized with any Shot manufacturing point.

Old Rubber.—The market for this material continues dull. The following quotations denote approximate prices, New York delivery :

Car Springs, ton lots, ℔ lb.	....	@	$0.03¼
Rubber Shoes, carloads, delivered at factory, ℔ lb..	....	@	.03
Rubber shoes, less than carloads, ℔ lb	2¼	@	.03⅛
Large Hose, ℔ ton	....	@	9.00
White Wringer Rolls, ℔ lb.	....	@	.04¼
White Syringes, ℔ lb.	....	@	.05

Old Rags, Paper, &c.—Little is doing at present in these lines, and the market maintains a condition of dullness. There are, however, indications of a better feeling, which, with the resumption of operations by paper mills, expected in the near future, may develop a material increase of business before the end of the month. Meanwhile prices are about as follows, delivered in New York :

No. 1 White Rags	℔ lb 3	@	3¼¢
No. 2 White Rags	℔ lb		1¾¢
Mixed Rags	℔ lb		¾¢
Blues and 3ds	℔ lb		1 ¢
Hard Sized White Shavings	℔ lb		2⅛¢
No. 1 White Book Shavings	℔ lb 2	@	2⅛¢
No. 2 White Book Shavings	℔ lb		1¼¢
Light Book Shavings	℔ lb		¾¢
No. 1 Mixed Shavings	℔ lb		1 ¢
No. 2 Mixed Shavings	℔ lb		⅛¢
No. 1 Printed Books	℔ lb 1	@	1¼¢
Ordinary Mixed Books	℔ lb ½	@	¾¢
Newspapers	℔ lb		⅛¢
No. 1 Manila Paper	℔ lb 1	@	1⅛¢
No. 2 Manila Paper	℔ lb ⅝	@	¾¢
Bogus Paper	℔ lb		½¢
Common Paper	℔ lb ¾	@	½¢
Straw Chips	℔ lb ⅛	@	⅛¢
Binders' Clippings	℔ lb ½	@	⅝¢
Jute Butts	℔ lb		1 1-10¢
No. 1 Jute Bagging	℔ lb		1¼¢
Mixed Bagging	℔ lb ¾	@	1 ¢
No. 2 Bagging	℔ lb ½	@	¾¢
Hemp Twine	℔ lb		2¼¢
Manila Rope	℔ lb		2½¢
Jute Rope	℔ lb 1½	@	1¾¢
Mixed Rope	℔ lb ¾	@	⅞¢

Old Metals.—There is a little more movement in the market for Old Metals. Prices depend largely, however, upon special circumstances, urgency of need for material, &c. The following quotations for New York are therefore only approximate :

Heavy Copper	℔ lb		8¾¢
Light and Tinned Copper	℔ lb		7½¢
Heavy Brass	℔ lb		6¢
Light Brass	℔ lb		5¢
Lead	℔ lb		3¢
Tea Lead	℔ lb		2¾¢
Zinc	℔ lb		2¾¢
No. 1 Pewter	℔ lb		14¢
No. 2 Pewter	℔ lb		7¢
Wrought Scrap Iron, ℔ gross ton	$12.00	@	$14.00
Heavy Cast Scrap, ℔ gross ton,	8 50		
Stove Plate Scrap, ℔ gross ton,	5.50		
Burnt Iron (delivered at mill), ℔ gross ton	6.75		

Trade Notes.

In an advertisement on another page the Vanderman Plumbing & Heating Company, Willimantic, Conn , call attention to some of their special tools for plumbers and steam fitters' use. Among the goods noted are Lead Pipe Cutters, Lead-Pipe Benders and a Joint Runner. They also invite the trade to send for Vanderman's Plumbers' Estimate and List Book, published in two editions, the prices of which are given.

In another part of this issue Joseph Huse & Son, 95 Blackstone street, Boston, Mass., call the attention of the trade to their complete line of Mica.

The Geuder & Paeschke Mfg. Company of Milwaukee, Wis., advise us that on account of a fire occurring in their warehouse August 30 their stock of manufactured goods in the warehouse was totally destroyed, incurring a loss of about $22,000, which, however, is fully covered by insurance. Their factory and general stock rooms, being located in an entirely different part of the city from this warehouse, are intact and, as they have a very large stock of raw material to replace the goods destroyed, they will suffer but little inconvenience and are in shape to fill all orders for Tinware and Sheet-Metal goods with but very little delay.

Sidney Shepard & Co., Buffalo, N. Y., issue a pamphlet of some of their wares, entitled "Seasonable Goods for the Months of," below which is a calendar for six months beginning with August, 1893, and ending with February, 1894. Sheet-metal goods of various sorts are noted, such as Coal Hods, Coal Vases, Stove-Pipe Elbows, Tea Kettles, Oil Cans, Eave Troughs, Stove Boards, &c. Other goods are Registers and Ventilators, Dampers, Lanterns and various Kitchen Utensils.

A J. Corcoran has removed from 76 John street to Corbin Building, Broadway and John street, New York. This firm manufacture the well known Corcoran Windmill; also Wood Tanks, Pumps, Tank Valves and Fixtures. Circulars are issued describing the Tanks made by A. J. Corcoran, which are both rectangular and round and of various sizes. These Tanks are used in many parts of the country and one of the circulars gives a list of those who have made use of them. Mr. Corcoran had been at 76 John street for about 26 years.

The Eastern Tinware Company's factory at Portland, Maine, started up on Monday on 40 hours' time in order to fill orders for goods.

The Lalance & Grosjean Mfg. Company's rolling mill, at Harrisburg, Pa., was started into full operation on Monday last. The firm's factory at Woodhaven, L. I., is running on half time, temporarily.

The Columbia Can Machine Company have been organized at Saco, Maine, with a capital of $250,000, to manufacture cans of all kinds, as well as tools and materials.

The Burns Stamping & Mfg. Company of Chicago Ridge, Ill., have been forced to place their affairs in the hands of a receiver. This, however, is not due to financial embarrassment, as has erroneously been stated in the Chicago newspapers. The trouble grows out of the location of the factory on a tract of land donated to the company by a land association. The company have complied with their part of the conditions preliminary to the passing of title, but the land association interposes objections which are considered unwarranted, and refuses to grant the deed. This puts the company in a peculiar position at this time, and a stockholders' bill was filed to protect their assets and bring the matter to a focus. The company have good reason to expect a decision by the courts in their favor, and their creditors are giving every assistance in tiding over the present unsatisfactory state of the company's affairs. Prospects for future business are excellent, and the managers of the company look forward to a prosperous career as soon as this controversy is settled in their favor.

The Anthony Wayne Mfg. Company, Fort Wayne, Ind., have prepared a repair chart, for hanging, of the parts of the Anthony Wayne, Wayne American, Western Star and Wayne Combination Washers. On one side of the chart are illustrations of the parts, numbered or lettered, and on the other side the names of the part with the price of each. This arrangement simplifies the ordering of repairs, as well as acquainting the merchant with the price to be charged.

Joshua S. Ingalls & Co. of Troy, Ohio, manufacturers of Craig polished Sheet Steel, have run their mill steadily since the beginning of the year, and have sold more Steel up to date than last year. They have not reduced their force by a man, nor have they reduced hours or wages.

Metal and Miscellaneous Prices.

CHICAGO, SEPTEMBER 7, 1893.

Tin—

Straits pigs.....21½¢

Imported Tin Plates—

Charcoal Plates.—Bright.

Guaranteed Plates command special prices, according to quality.

		Per box.
Calland and Melyn Grade	IC, 10 x 14	@ $6.75
	IC, 12 x 12	@ 6.75
	IC, 14 x 20	@ 6.75
	IC, 20 x 28	@ 13.50
	IX, 10 x 14	@ 8.75
	IX, 12 x 12	@ 8.75
	IX, 14 x 20	@ 8.75
	IX, 20 x 28	@ 17.50
	DC, 12½ x 17	@ 6.50
	DX, 12½ x 17	@ 8.50
Allaway Grade,	IC, 10 x 14	@ 6.50
"	IC, 12 x 12	@ 6.50
"	IC, 14 x 20	@ 6.50
"	IC, 20 x 28	@ 13.00
"	IX, 14 x 20	@ 8.00
"	IX, 20 x 28	@ 16.00

Coke Plates—Bright.

	Per box.
Steel Coke—IC, 10x14.14x20.	$5.85 @$6.00
IC, 14x20.90 ℔	5.60 @ 5.75
IC, 14x20, 100 ℔	@ 5.85
10 x 20	8.75 @ 9.00
20 x 28	11.70 @12.00
X, 10x14, 14 x 20	@ 7.50
B.V. Grade. IC,10x14, 14x20.	5.85@ 6.00

Charcoal Plates.—Terne.

Guaranteed Plates command special prices, according to quality.

Mansel and Dean Grades.—

IC. 14 x 20	@ $5.62½
20 x 28	@ 11.25
IX. 20 x 28	@ 14.25

Worcester Brand and equal.—

IC, 14 x 20	6.12½@ .....
IC, 20 x 28	12.25 @ .....
IX, 14 x 20	7.62½@ .....
20 x 28	15.25 @ .....

American Tin Plates.

Charcoal Plates.—Bright.

Irondale, A. A.—	IC, 14 x 20	$7.00
" "	IX, 14 x 20	9.00
" "	IXX, 14 x 20	11.00
" "	IC, 20 x 28	14.00
" "	IX, 20 x 28	18.00
" "	IXX, 20 x 28	22 00

Florence.—

IC, 10 x 14, 12 x 12, 14 x 20	$6.75
IX, 10 x 14, 12 x 12, 14 x 20	8.50

Palma.—

IC, 10 x 14, 12 x 12, 14 x 20	$7.25
IX, 10 x 14, 12 x 12, 14 x 20	9.25

Each extra cross $2.00 and 20 x 28 double these prices.

Brilliant, Tissue Packed, IC, 14 x 20.	$9.25
Royal ,extra, IC, 14 x 20	7.25
Merion, IC, 14 x 20	7.00
Almond, IC, 14 x 20	6.50
Mint, IC, 14 x 20	6.25

Coke Plates.—Bright.

Elwood.—IC, 14 x 20	$6.00
" IC, 20 x 28	12.50

Roofing Plates.

Arch, IC, 20 x 28	@$11.75
Crescent, IC, 20 x 28	@ 12.25
Crescent, IX, 20 x 28	@ 15.25
Empire, IC, 20 x 28	@12 50
Empire, IX, 20 x 28	@15.50
Hickory, IC, 20 x 28	@ 12.75
" IX, 20 x 28	@ 15.75
Alaska (heavily coated),IC,20x28	@$14.50
Alaska IX, 20 x 28	@ 17.75
Special, IC, 20 x 28	@ 15.50
" IX, 20 x 28	@ 18.50
Merchant's Roofing (extra coated), IC, 20 x 28	@$17.75
Merchant's Roofing (extra coated), IX, 20 x 28	@$21.50
Merchant's Old Method, (extra heavily coated), IC, 20 x 28	@$19.75
Merchant's Old Method (extra heavily coated), IX, 20 x 28	$23.60

Irondale A :

IC, 14 x 20	$6.25
IX, 14 x 20	7.75
IC, 20 x 28	12.50
IX, 20 x 28	15.50

Westmoreland :

IC, 14 x 20	$6.25
IC, 20 x 28	12.50

Elwood :

IC, 20 x 28	$12.00

Juno :

IC, 14 x 20	$5.75
IC, 20 x 28	11.50

Illinois, Old Method :

IC, 20 x 28	$17.00

E. L.:

IC, 20 x 28	$12.50

Jessie :

IC, 20 x 28	$12.00

Scott's Extra Coated, Stamped and Resqured, IC, 14 x 20 ..... $9.50

Scott's Extra Coated, Stamped and Resqured, IX, 14 x 20 ..... 11.00

Scott's Extra Coated, Stamped and Resqured, IC, 20 x 28 ..... 19.00

Scott's Extra Coated, Stamped and Resqured, IX, 20 x 28 ..... 22.00

Neville, Stamped, IC, 14 x 20	6.25
" " IX, 14 x 20	7.50
" " IC, 20 x 28	12.50
" " IX, 20 x 28	15.00
Taylor's Old Style, IC, 14 x 20 (Stamped and Resqured)	$9.50
Taylor's Old Style, IC, 20 x 28 (Stamped and Resqured)	19.00
Taylor's Roofing, IC, 14 x 20 (Stamped and Resqured)	8.25
Taylor's Roofing, IC, 20 x 28 (Stamped and Resqured)	16.50
Columbia, IC, 14 x 20 (Stamped)	7.25
" IC, 20 x28 (Stamped)	14.50
Maple, IC, 14 x 20 (Stamped)	6.75
" IC, 20 x 28 (Stamped)	13.50
Willow, IC, 14 x 20	6.50
" IC, 20 x 28	13.00
Knoxall, IC, 14 x 20	6.25
" IC, 20 x 28	12.50
Globe, IC, 14 x 20	6.00
" IC, 20 x 28	12.00
Miami, IC, 14 x 20	6.00
" IC, 20 x 28	12.00
" IX, 20 x 28	15.00
" (Redipped), IC, 20 x 28	17.00

Tin Boiler Plates.

	Per box of 100 sheets.	Per box of 112 sheets.
X, 14 x 28	$13.00	$13.00
XX, 14 x 28	14.50	14.50
X, 14 x 31	14.50	15.80
XX, 14 x 31	16.50	17.50
X, 14 x 56	29.50	16.50
XX, 14 x 56	32.50	18.20
X, 14 x 60	31.50	17.65
XX, 14 x 60	35.50	20.90

Sheet Iron—

Black.

	Common American	Refined.
Nos. 10 to 16	℔ 2 7 10¢	3 3-10¢
17 to 20	℔ 2 8 10¢	3 4-10¢
21 to 24	℔ 2 9-10¢	3 5-10¢
25 and 26	℔ 3¢	3 6-10¢
27	℔ 3 1-10¢	3 7-10¢

Russia, Planished, &c.

Genuine Russia, all numbers....13¢ net.
Patent Planished....℔ A, 10¼¢; B, 9¼¢ dis. 5%

Galvanized.

Juniata or first quality.....dis. 70&5%

Copper—

Ingot.

Lake.....11¾¢ @ 12¼¢
Casting Brands.....11¢ @ 11½¢

Sheet and Bolt.

Discount, 25%.

Copper Bottoms.

Discount, 25%.

Seamless Brass and Copper Tubes.

Base price, 17½¢, Chicago, with extras according to size.

Copper, Bronze and Gilding Tube, 3¢ ℔ additional.

Brazed Brass Tubing.
(To No. 20 inclusive.)

Add freight from New York to Chicago to these prices, or 50¢ ℔ 100 ℔.

Above 5-16 inch to 3 inch inclu	35¢
Plain, above 3 inch	45¢
Plain, 5-16 inch	45¢
Plain, ¼ inch	60¢
Plain, 3-16 inch	$1.00
Plain, ⅛ inch	$1.50
Fancy Tubing, Brass, to No. 20 incl	43¢ ℔
Bronze Tubing, 3¢ ℔ ℔ more than Brass	

35 @ 40 %

Roll and Sheet Brass.

Discount, 35 @ 40%.

Slab Spelter—

Western Spelter.....5

Sheet Zinc—

600 ℔ casks.....6¼¢
300 ℔ casks.....6½¢
Loose sheets.....6¾¢

Lead—

Soft Pig Lead.....4¼¢
Bar.....4.60¢@5¢
Pipe.....5½¢, dis. 10¢
Block Tin Pipe.....35¢
Sheet.....6¢, dis. 10%

Solder—

½&½.....13¢@13¼¢
Extra Wiping.....11½¢

The prices of the many other qualities of Solder in the market indicated by private brands vary according to composition.

Antimony—

Cookson.....12 @12½¢
Hallett's.....11¾¢ @11¾¢

Wrought-Iron Pipe—

List on following page.

1¼ and under, Plain	57½&10%
1¼ and under, Galv	52½&10%
1½ and over, Plain	67½&10%
1½ and over, Galv	60&10%
Boiler Tubes, list Oct. 24, 1892	65@67½%
Casing, list Nov. 16, 1892	52½%
Inserted Joints Casing, list Nov. 16, 1892	47½%
Steel Boiler Tubes	27½%
Cold Drawn Seamless Steel Tubing	50%

Cast-Iron Soil Pipe—

Cast-Iron Soil-Pipe, Tarred ; sizes 2 to 6 inches, inclusive.....dis 70&2½%
Other sizes.....dis 60%

Leader Pipes—

Abendroth's Galv. Spiral Riveted	60%
Austin's Corrugated	60%
Gordon & Gilbert's Corrugated	60%
Ritchie's (Galv. Iron only) Cor'd	60%
Ritchie's Spiral Lock Seam, Galv'd	55%
Austin's Spiral Ribbed Pipe	60%
Plain Adjustable Elbows	60%
James A. Miller Bros. (Galv'd Iron only) Corrugated	60%

Furnace Fittings—

Discount from Excelsior Steel Furnace Co.'s list.....50%

Steel Roofing—

Perfection	$3.75 square
Climax	$3.50 square
The Lloyd Spanish Tiling	$4.50 square

Metallic Shingles—

Cushman's	$1.25 square
Merchant & Co.'s Spanish Tiles :	
Copper, 14 oz	$36.00 square
Tin	$9.75@$14.25 square
Steel, painted	$9.00 square

Drain Pipe—

Discount from list.....50%

Paints Oils, &c.—

Deodorized Benzine	7½@8 ¢
Iron Paint, Bright Red	℔ D, 2 ¢
" " Brown	℔ D, 1½¢
" " Purple	℔ D, 2½¢
" Ground in oil, B. Red	℔ D, 6½¢
" Ground in oil, Red	℔ D, 6½¢
" Ground in oil, Brown	℔ D, 5½¢
" Ground in oil, Purple	℔ D, 6 ¢
Linseed Oil, Boiled, in bbls	53¢
Linseed Oil, Raw, in bbls	50¢
Mineral Paints	2@4¢
Orange Mineral	10¾¢
Pure White Lead in Oil	6¾@7¼¢
Dry White Lead in bbls	6¼@6¾¢
Red Lead, American	7@7½¢
Red Venetian, English, dry	$1.65@$1.70
Red Venetian in oil; asst'd cans, kegs	8½¢ ; 7½¢
Sipe's Japan Oil, in bbls, ℔ gal	34¢
Spirits Turpentine, in bbls., ℔ gal	32½¢
Asphaltum, Trinidad Refined, ℔ ton	$25
Tarred Felt, 1 Ply, ℔ 100 ℔	$1.65
Tarred Felt, 2 Ply, ℔ roll 108 sq. feet	$1.50
Tarred Felt, 3 Ply, ℔ roll of 108 sq. feet	$2.00
Roofing Pitch, ℔ bbl. of 300 ℔	$3.20

NEW YORK, SEPTEMBER 8, 1893.

The following quotations are for small lots.

Aluminum—

No. 2 Grade Metal, in ton lots..℔ D, $0.75
No 1 (guaranteed to be 98 % pure and over), in ton lots .....℔ D .90
Lots less than 1 ton, 10¢ ℔ D additional.

Antimony—

Cookson .....℔ D, 11¢
Hallett's.... .....℔ D, 10½¢

Brass—

Planished..... .....net
Roll and Sheet.....35@40%

Brass and Copper Tubes

Brazed Brass Tubing—

List May 20, 1889.

	Per D.
Plain, to No. 20 inclusive, above 5-16 inch to 3 inch inclusive	$0.35
Plain, to No. 20, above 3 inch	45
Plain, 5-16 inch to No. 20	45
Plain, ¼ inch	60
Plain, 3-16 inch	1.00
Plain, ⅛ inch	1.50
Fancy Tubing to No. 20, inclu	43

35@40%

Copper and Bronze Tubing—

3¢ ℔ D more than brass.

Bronze, Tobin—

Drawn Rods for Bolts, Forgings, &c

Over ¼ to 3½ inches inclusive....17¢ ℔ D
Over 3½ to 5 inches inclusive.....18¢ ℔ D

Piston Rods, Finished True, Smooth and Straight.

Over ¼ to 3½ inches inclusive....18¢ ℔ D
Over 3½ to 5 inches inclusive.....19¢ ℔ D

Clips—

Buffalo Damper: Nos. 1, $1.25; 2, $2.50 per doz.....40&10%

Conductors—

Corrugated. *Round or Square—*

Galvanized 60%
Galvanized, Locked Joints.....60%
Tin.....60%

Spiral Riveted—

Galvanized 50%

See also *Elbows and Shoes; Eave-Trough Miters; Strainers, Conductor.*

Conductor Strainers—See *Strainers, Conductor.*

Copper—

Bottoms, Pits and Flats....25@25&5%

Ingot.

Lake.....11¢
Ansonia Grade Arizona.....10¾¢
Ansonia Grade Casting.....10¢
Planished. .....net
Sheet and Bolt.. .....25&25&5%

Tubes — See *Seamless Brass Tubes.*

Coppers, Soldering—

See *Irons, Soldering*, in Current Hardware Prices.

Damper Clips Buffalo—

See Clips, Buffalo Damper.

Eave Troughs—

Lap or Slip Joint, Galvanized.....60&10%
Lap or Slip Joint, Terne.....60%

Eave-Trough Mitres—

Lap or Slip Joint.....list, net

Elbows—

Plain Adjustable—

Tin.....70%
Galvanized.....70%

Crimped Tubing—

Re-Tinned or Galvanized.....35%

Stove-Pipe—

Buffalo Four-Piece.

4½	5	5½	6	7 inch,
$0.78	.87	.90	.99	1.20 per doz.

.20 %

Elbows and Shoes—

Flat Crimp.

Tin.....35%
Galvanized 35%

Corrugated.

Flat Crimp.

Galvanized.....60%

Round or Square.

Tin.....60%
Galvanized.....60%

Iron, Sheet—

Black.

	Common American.	R. G. Cleaned American.
Nos. 10 to 16	℔ D, 2½	3 10¢
Nos. 17 to 20	℔ D, 2.85	3.10¢
Nos. 21 to 24	℔ D, 2.90	3.20¢
Nos. 25 and 26	℔ D, 3.05	3.30¢
No. 27	℔ D, 3.15	3.40¢
No. 28	℔ D, 3¼	3½¢

American B. B. .....℔ D, 4¢@4½¢

Russia, Planished, &c.

Genuine Russia, according to assortment.....℔ D, 11¾@12½¢
Patent Planished....℔ D, A, 10¢; B, 9¢, 5%
Craig Polished Sheet.....℔ D, 8½¢

Galvanized.

	B. B.
Nos. 10 to 16	70&2½@ 70&5%
Nos. 17 to 22	
Nos. 23 to 24	
Nos. 25 to 26	
No. 27	
No. 28	
Nos. 29 and 30	

Filter Joints—

Lee's..... .....33⅓ %

Lead—

American Pig..... .....4¢@4.10¢
Bar..... .....4½¢

New York Prices.

Pipe	6½¢, 20%
Tin Lined Pipe	15¢, 20%
Block Tin Pipe	37½¢, 20%
Sheet	7¢, 20%

Old Lead in exchange, 3½¢ ℔ D.

Metal, Expanded—

Manufacturers' list No. 5.

Lathing	10%
Fencing, Painted Sheets	20%
Netting, Painted Sheets	20%
Door Mats, Galvanized	25%
Window Guards, Paneled	15%
Tree Guards, Paneled	15%

Mitres Eave-Trough—See *Eave-Trough Mitres.*

Paints Oils &c.—

Lead, Amn. White, in oil	6¾ @ 7¼
Lead, Red, bbls. and ½ bbls	6½ @ 7
Lead, Red, kegs	6½ @ 7
Ocher, American	1 @ 1¼
Red, Venetian, American	1½ @ 2½

Linseed Oil:
Raw, ℔ gal..... .. @ .40
Boiled..... .. @ .43

Spirits Turpentine:
In bbls..... .. @ .32

Putty:
In barrels and ½ bbls..... .01¾ @ .01⅞
In tubs..... .01⅞ @ .01⅝
In tin cans..... .01⅞ @ .02¼
In bladders..... .01⅞ @ .02¼

Roofing Material, &c.:
Asphaltum, Trinidad Refined, ℔ ton..... $30.00@$35.00
Asphaltum, Rock, ℔ ton..... $14.00
Coal Tar Felt, 1 Ply, ℔ ℔..... 2¢
Coal Tar Felt, 2 Ply, ℔ roll 108 sq. ft. $1.42½
Coal Tar Felt, 3 Ply, ℔ roll 108 sq. ft. $1.8c
Roofing Pitch, ℔ bbl..... $2.24

Pipe, Drain 50%

Pipe and Fittings, Cast Iron Soil—

Cast-Iron Soil Pipe, Tarred, sizes 2 to 6 Inches, inclusive..... 60@60&10%
Other sizes..... 55@55&10%
Cast-Iron Fittings, Tarred, sizes 2 to 6 inches..... 60@60&10%
Other sizes..... 55@55&10%

Pipe, Spiral—

Galvanized..... 60%
Tin..... 60%

Rock and Slag Wool—

	℔ ℔	℔ cub. foot.
Slag Wool, ordinary	1¼	19¢
Slag Wool, extra	4½	38½¢
Rock Wool, ordinary	2½	27¢
Rock Wool, extra	7¾	43½¢

Rosin—

Common and Good—Strained,
Rosin, C. & D..... ℔ bbl. $1.02@$1.05
Rosin, E. & F..... ℔ bbl. $1.15@$1.30
Rosin, G. & H..... ℔ bbl. $1.45@$1.70
Rosin, I. & K..... ℔ bbl. $1.90@$2.35
Rosin, M. & N..... ℔ bbl $2.50@$3.50

Seamless Brass Tubes..net

Shoes and Elbows—See *Elbows and Shoes.*

Slate Roofing—

According to size, f.o.b. cars, Quarry Station.

Pennsylvania:
Best Bangor, ℔ sqr..... $3.25@$4.50
Pen Argyle, ℔ sqr..... 3.50@ 4.25
Peach Bottom, ℔ sqr..... 5.00@ 6.25
No. 1 Chapman, ℔ sqr..... 4.00@ 4.65
Lehigh Slates, ℔ sqr..... 3.00@ 4.50
Vermont:
Sea Green, ℔ sqr..... 2.70@ 3.20
Purple, ℔ sqr..... 3.50@ 4.50
Unfading Green, ℔ sqr..... 3.50@ 4.00
Red, ℔ sqr..... 9.75@12.00

Solder and Soldering Fluids—

Solder—

½ & ½ (Guaranteed)..... 13½@14½¢
No. 1..... 11¾@12 ¢
Prices of Solder indicated by private brands vary according to composition.

Soldering Fluids—

Concentrated Soldering Flux.
f.o.b. New York.
In barrels, ℔ ℔..... 4¢
Smaller quantities, ℔ ℔..... 6¢

Gedney's Soldering Fluid.
In carboys or barrels, ℔ ℔..... 2¢
$1.50 for carboy or barrel; money refunded when returned.

Perfection Soldering Flux.
No charge for package.
8bls., about 500 ℔, ℔ ℔..... 3½¢
½ bbls., about 300 ℔, ℔ ℔..... 4¢
Kegs, about 110 ℔, ℔ ℔..... 4¢
75¢ extra for keg. } 5 % dis.
Kegs, about 55 ℔, ℔ ℔..... 4¢

Yager's Soldering Salts.
¼-℔ bottles, each..... 30¢
Large quantities, per ℔..... 40¢

Spelter—

Western Spelter..... 4¼¢@4⅝¢
Bertha..... 8¼¢@9¢

Spiral Pipe—See *Pipe, Spiral.*

Stove-Pipe Elbows—*See Elbows, Stove Pipe.*

Stove Polish—See *Polish, Stove.*

Stove Trucks—See *Trucks, Stove.*

Strainers Conductor—

Galvanized..... 60%

Tin, Pigs and Bars—

Banca, pigs, ℔ ℔..... 21½¢
Straits, pigs, ℔ ℔..... 21¢
Straits in bars, ℔ ℔..... 22¢

Tin Plates—

American Terne Plates—

Apollo Roofing.

IC, 14 x 20..... $6.25
IC, 20 x 28..... 12.50
IX, 14 x 20..... 7.25
IX, 20 x 28..... 14.50

Buckeye.

IC, 14 x 20..... $7.00
IC, 20 x 28..... 14.00
IX, 14 x 20..... 8.25
IX, 20 x 28..... 16.50
IXX, 14 x 20..... 9.50
IXX, 20 x 28..... 19.00

De Mill's.

First New York, IC, 14 x 20..... $5.75
" " IC, 20 x 28..... 11.50
First New Jersey, IC, 14 x 20..... 5.75
" " IC, 20 x 28..... 11.50
Manhattan, IC, 14 x 20..... 7.00
" IC, 20 x 28..... 14.50

Dunlap's.

Double Dipped, IC, 14 x 20..... $8.25
" " IC, 20 x 28..... 16.50
" " IX, 14 x 20..... 9.50
" " IX, 20 x 28..... 19.00
Domestic, IC, 20 x 28..... 12.00
" IX, 20 x 28..... 15.00

Glendale Tin Plate Co.

Optimus, Best Redipped, IC, 14 x 20. $8.25
" " " IC, 20 x 28. 16.50
" " " IX, 14 x 20. 9.75
" " " IX, 20 x 28. 19.50
N. F., Old Style, IC, 14 x 20..... 7.50
" " " IC, 20 x 28..... 15.00
" " " IX, 14 x 20..... 9.00
" " " IX, 20 x 28..... 18.00
Bonus, Extra Coated, IC, 14 x 20... 6.75
" " " IX, 14 x 20... 8.25
" " " IC, 20 x 28... 13.50
" " " IX, 20 x 28... 16.50

Gummey, Spering & Co.

	14 x 20	20 x 28
IC Terne, Pennsyl Old Method, Treble Coated	$8.50	$16.75
IC Terne, Leominster, Extra coated	7.75	15.00
IC Terne, Waldo, Redipped	7.25	14.00
IC Terne, Alderly, Extra quality	6.37½	12.50
IC Terne, Phoenix	5.80	11.50
IC " Climax	5.70	11.25
IC " Venux	5.60	11.00
IC " Flag	5.50	10.50

Hamilton's.

Hamilton's Best Redip'd, IC, 14x20 $9.25
" " " IC, 20x28 18.50
" " " IX, 14x20 10.75
" " " IX, 20x28 21.50
Osceola Hand Coated, IC, 14x20 8.25
" " " IC, 20x28 16.50
Osceola Hand Coated, IX, 14x20 9.75
" " " IX, 20x28 19.50
Lula Best Charcoal, IC, 20x28 12.50
" " " IX, 20x28 16.00

Laufman's.

Apollo, IC (Resquared), 14 x 20..... $8.12
Apollo, IX (Resquared), 14 x 20..... 9.37
Apollo, IC (Resquared), 20 x 28..... 16.00
Apollo, IX (Resquared), 20 x 28..... 18.50
Apollo, IC (Resquared), 20 x 56..... 16.00
Apollo, IX (Resquared), 20 x 56..... 18.50
Tip Top, IC (Resquared), 14 x 20..... 6.62
Tip Top, IX (Resquared), 14 x 20..... 7.88
Tip Top, IC (Resquared), 20 x 28..... 13.00
Tip Top, IX (Resquared), 20 x 28..... 15.50
Allegheny, IC, 14 x 20..... 6.12
Allegheny, IX, 14 x 20..... 6.38
Allegheny, IC, 20 x 28..... 12.00
Allegheny, IX, 20 x 28..... 12.50

McKinley Tin Plate Co.

McKinley:
IC, 20 x 28..... $12.00
IX, 20 x 28..... 15.00
Fort Pitt.
IC, 20 x 28..... $11.00
Chicago:
I, 20 x 28..... 11.50
Wilkinsburg Redipped:
IC, 20 x 28..... $16.00
IX, 20 x 28..... 19.00

Merchant's.—All Stamped

Crescent, IC, 20 x 28..... $12.00
Crescent, IC, 14 x 20..... 6.00
Hickory, IC, 20 x 28 (Resquared).. 12.75
Hickory, IC, 14 x 20 (Resquared)...6.37½
Empire, IC, 20 x 28..... 12.25
Empire, IC, 14 x 20..... 6.12½
Alaska, IC, 20 x 28 (Resquared).... 14.00
Alaska, IC, 14 x 20 (Resquared).... 7.00
Merchant's Roofing, IC, 20 x 28 (Resquared)..... 17.00
Merchant's Roofing, IC, 14 x 20 (Resquared)..... 8.50
Merchant's Old Method, IC, 20 x 28 Resquared)..... 19.00
Merchant's Old Method, IC, 14 x 20 (Resquared)..... 9.50

Merry's.

Lion, IC, 14 x 20 (Stamped)..... $6.25
IC, 20 x 28..... 12.50
Palacio, IC, 14 x 20..... $5.55
IC, 20 x 28..... 11.00

Pittsburgh Tin-Plate Works.

Kensington:
IC, 14 x 20..... $6.75
IC, 20 x 28..... 13.50
IX, 14 x 20..... 8.00
IX, 20 x 28..... 16.00
Westmoreland:
IC, 14 x 20..... $6.25
IC, 20 x 28..... 12.50
Juno:
IC, 14 x 20..... $5.75
IC, 20 x 28..... 11.50

Scott's.—All Stamped.

Scott's Extra Coated, IC, 14 x 20 (Resquared)..... $9.25
Scott's Extra Coated, IX, 14 x 20 (Resquared)..... 10.75
Scott's Extra Coated, IC, 20 x 28 (Resquared)..... 18.50
Scott's Extra Coated, IX, 20 x 28 (Resquared)..... 21.50
Neville, IC, 14 x 20..... 6.00
" IX, 14 x 20..... 7.25
" IC, 20 x 28..... 12.00
" IX, 20 x 28..... 14.00

N. & G. Taylor Co.'s.

Taylor, Old Style, IC, 14 x 20 (Stamped and Resquared)..... $9.25
Taylor Old Style, IC, 20 x 28 (Stamped and Resquared)..... 18.50
Taylor Roofing, IC, 14 x 20 (Stamped and Resquared)..... 8.00
Taylor Roofing, IC, 20 x 28 (Stamped and Resquared)..... 16.00
Columbia, IC, 14 x 20 (Stamped)... 7.00
Columbia, IC, 20 x 28 (Stamped)... 14.00
Maple, IC, 14 x 20 (Stamped)..... 6.50
Maple, IC, 20 x 28 (Stamped)..... 13.00
Willow, IC, 14 x 20..... 6.25
Willow, IC, 20 x 28..... 12.50
Knoxall, IC, 14 x 20..... 6.00
" IC, 20 x 28..... 12.00
Globe, IC, 14 x 20..... 5.75
Globe, IC, 20 x 28..... 11.50

A. A. Thompson & Co.'s.

Old Colony, IC, 14 x 20..... $8.00
" " IC, 20 x 28..... 16.00
Thompson's Puritan, IC, 14 x 20..... 5.75
" " IC, 20 x 28..... 11.50
Durham, IC, 14 x 20..... 5.75
" IC, 20 x 28..... 11.50
Central, IC, 14 x 20..... 5.45
" IC, 20 x 28..... 10.75
" WC, 14 x 20..... 5.25
" WC, 20 x 28..... 10.25
Tarn, IC, 20 x 28..... 10.50

U. S. Brands.—All Stamped.

U. S. Monongahela, IC, 14 x 20..... $6.50
U. S. Redipped, IC, 14 x 20..... 9.25
20 x 28 double the price of 14 x 20

American Bright Plates—

Continental Tin Plate Works.

	"Phoenix" extra.	Climax
IC, 14 x 20, Bright	$6.50	$6.25
IX, " "	8.00	7.75

All sizes and thicknesses, etc.

Merchant's.

Merchant's Dipped, IC, 14x20..... $11.00
Palma Xtra, IC, 14x20..... 7.25
Florence, IC, 14x20..... 6.75

Merry's

Hazel, IC, 14x20..... $5.85

N. & G. Taylor Co.'s.

Brilliant, Tissue Packed, IC, 14x20.. $9.00
Royal, extra, IC, 14x20..... 7.00
Merion, IC, 14x20..... 6.75
Linden, IC, 14x20..... 6.50
Almond, IC, 14x20..... 6.25
Mint, IC, 14x20..... 6.00

U. S.

IC, 14x20..... $7.25
IC, 20x28..... 14.50

Imported Terne Plates—

Charcoal.

Dean Grade.—IC, 14 x 20..... @$5.50
20 x 28..... @11.00
IX, 14 x 20..... @ 6.75
20 x 28..... @13.50
Abercarne Grade.—IC, 14 x 20..... @ 5.40
20 x 28..... @10.80
IX, 14 x 20..... @ 6.62½
20 x 28..... @13.25

Imported Bright Plates

Charcoal.
Duty: 2.2¢ ℔ ℔.

Melyn and Caland Grade. IC, 10 x 14..... @$6.50
" " IC, 12 x 12..... @ 6.75
" " IC, 14 x 20..... @ 6.50
" " IC, 20 x 28..... @13.00
" " IX, 10 x 14..... @ 8.50
" " IX, 12 x 12..... @ 8.75
" " IX, 14 x 20..... @ 8.50
" " IX, 20 x 28..... @17.00
" " DC, 12½ x 17..... @ 6.00
" " DX, 12½ x 17..... @ 8.00
Allaway Grade. IC, 10 x 14..... @ 6.00
" " IC, 12 x 12..... @ 6.25
" " IC, 14 x 20..... @ 6.00
" " IC, 20 x 28..... @12.00
" " IX, 10 x 14..... @ 7.50
" " IX, 12 x 12..... @ 7.75
" " IX, 14 x 20..... @ 7.50
" " IX, 20 x 28..... @15.00
" DC, 12½ x 17..... @ 5.50
" " DX, 12½ x 17..... @ 7.00

Coke.

Steel Coke.—IC, 10x14, 14x20. $5.40@$5.50
10x20..... @ 8.50
20x28. 11.50@12.00
IX, 10x14, 14x20..... @ 6.75
B. V. Grade.—IC, 10x14, 14x20..... @ 5.50

Imported Boiler Plates.

IXX, 14x26..(112 sheets)..... @$13.38
IXX, 14x28..(112 sheets)..... @ 14.50
IXX, 14x31..(112 sheets)..... @ 16 00

Tinning—

Brass and Copper..... net

Tubing—

Tin..... 50%
Galvanized..... 55%

Brass and Copper.

Standard List..... 35@40%

Troughs, Eave—See *Eave Troughs*

Trucks Stove—

Improved Lock Frame, per doz.... $15.00
Steel Lock Frame, per doz..... 18.00
Daisy Improved Pattern, ℔ doz..... 18.00

Zinc—

600 ℔ casks..... 6¢
Per ℔..... 7¢

News and Notes.

Negotiations between the governments of Japan and Mexico in regard to the introduction of Japanese labor into the latter country have been carried to a successful issue. Japan will permit her people to emigrate to Mexico, whose Government will, in turn, guarantee them protection. They are needed for employment in the coffee, sugar and cotton plantations of the Republic, as well as in the mines and factories.

The Baltimore *Sun* states that four steamers laden with an aggregate of 13,000 tons of iron ore from Santiago, Cuba, were discharging at Sparrow's Point, Md. It is said that the Maryland Steel Company will store 40,000 tons of ore in bond, and unless business becomes more active the company will work upon what is stored, which means a temporary curtailment of imports.

Scrap-iron dealers in Boston are agitated over the threatened action of the Navy Department in discontinuing the use of scrap iron for the manufacture of chain cables at the Boston yard, owing, it is said, to tests made having proved that chains made from scrap are inferior in tensile strength to those made from new bar iron.

An international agricultural exhibition is being arranged in Vienna for April, May and June, 1894.

Talk of an underground system of rapid transit for New York is cropping up again.

The new United States cruiser "Olympia" had her first trial trip on the bay at San Francisco on Thursday. Everything is reported as having been satisfactory and it is expected that more than the contract 20 knots will be obtained from the vessel when the official trial is made.

The Manitoba Government has issued its official bulletin regarding the crops of that province, which in all sections are reported as excellent. The estimated yields are given as: Wheat, 22,000,000 bushels; oats, 16,000,000 bushels; barley, 4,000,000 bushels; and flax, 150,000 bushels.

The Watkin tower, at Wembly Park, near London, is approaching completion. Sir Benjamin Baker is the engineer of this great erection, which, when finished, will have a hight of 1150 feet, or 176 feet more than Eiffel's tower in Paris.

Among the recent arrivals from Europe were Andrew Carnegie and Henry Phipps, Jr.

The Commissioner of Patents has refused an application for a trade-mark, applied for by Governor Tillman of South Carolina, for whiskies dealt in by the State, on the ground that the State has no right to trade in liquors, except within its own limits, and is therefore not entitled to a registered trade-mark.

Arrangements are being made by the Federal immigration authorities for the establishment of inspecting stations at various points on the Canadian frontier in order to maintain a more efficient system for the inspection of immigrants coming to the United States by way of Canada.

THE METAL WORKER.

NEW YORK AND CHICAGO.

Saturday, September 16, 1893.

DAVID WILLIAMS, - PUBLISHER

BUSINESS OFFICES:

NEW YORK.....96-102 Reade Street.
PHILADELPHIA.....220 South Fourth Street.
BOSTON.....146 Franklin Street.
PITTSBURGH..... Room 509 Hamilton Building.
CHICAGO.....59 Dearborn Street, cor. Randolph.
CINCINNATI.....Rooms 22-24 Pickering Building
ST. LOUIS.....Bank of Commerce Building.
CLEVELAND.....312 The Cuyahoga.

BRITISH AGENCY: The Ironmonger, 42 Cannon street, London, England.

The Present Labor Market.

It has been noticed by the New York tinners that there are at the present time quite a number of Western tinners in the city looking for work. Inquiries about Boston discover that city to be the final destination, though why or what they intend to do when they get there is unknown. A short time since a great many of the local plumbers were visiting the different shops in search of a job, but at present the number out of work is noticeably less. The steam and hot-water fitter has been more fortunate all through the dull season, for while many did not have work all of the time every one had more or less work each week. Men who have some experience or aptness in stove jobbing are now finding employment in that field in the absence of work at their regular trade or something more agreeable.

Deterioration of Products.

The market is now flooded with cheap articles whose actual value, as based upon the service they will perform compared with their cost, shows them to be much dearer than articles of better quality costing much more. An amusing illustration of this is to hand in the experience of a gentleman upon whose premises had come a plague of mice. Traps for these nuisances, of a variety tried years ago and found excellent, were purchased at 8 cents apiece. When first introduced this sort of trap was "a killer," and hence was selected in full anticipation that by its aid the nuisance would speedily be abated. But these traps in the days wherein they made a reputation sold at 25 cents each. The householder preferred to set his traps in favorable positions with tempting baits of cheese rind, but the only things captured were the baits. The mice went in, gratified their appetites with a dainty lunch, and then, as they could not go out the way they came in, squeezed their way through the wire bars with little effort and apparently no inconvenience, and held themselves in readiness to accept, with thanks, any future invitations to similar lunches that might be extended to them. The purchaser of these traps is now occupying himself with attempts at determining how many mouse traps at 8 cents apiece, that will catch no mice, would equal in value a good, serviceable trap, for which 25 cents is the retail price.

Manners and Money.

The art of all arts is the art of succeeding, and success in business requires tact. Tact, in turn, is simply an intelligent use of commercial politeness. The time has gone when a surly, ill-tempered and excitable man can hope to work his passage to success. It is as necessary for a salesman to possess tact and a polite manner, adjustable to his customers' preferences, as it is for him to be intimately acquainted with the details of the goods themselves. Take a salesman of tact out of a dry goods or grocery store and put him behind the counter of a hardware store and he will sell more goods and earn a larger salary than an ill-tempered hardware clerk who has spent his life among the nails and locks. This same principle is seen in the versatile talents of business men, who make an equal success of any line of trade they engage in, for the reason that they bring to bear upon the particular line their tact and polite manners, and this holds their customers regardless of outside competition. When you go to buy a box of pens, or a loaf of bread, you don't always go to the store which has the largest variety or the closest prices, but from force of habit and personal preference patronize some smaller store where you meet a clerk or proprietor whose manners are agreeable and cordial.

True Politeness.

Politeness, however, to be of much permanent value must not be a mere veneer of fine words and "soft soap" mannerisms; it must have a sincere atmosphere, which is only the result of a real interest in the public, not only individually, but as a class. The kind of politeness which utters fair words and sweet promises to the face, and laughs in its sleeve behind the back of the customer, only survives until its deception is discovered. The man who cringes for public patronage with his mouth and hates the public in his heart has never touched the lever of real manners, which are born from within and not hatched on the surface. We often meet people who speak of "the public" as if it were a separate race of people entirely distinct from themselves, forgetting that "we" are the public, and that in honestly serving the public we are simply serving ourselves. A man can no more separate himself from the public by imaginary barriers and succeed in business than he can lift himself off the ground with his boot straps. When a man has real politeness, he practically takes the same view of his goods as does the customer, and finds no pleasure in forcing a sale which is not a fair exchange of values. The short-sighted man may think he is losing ground if he lets a customer go out of his store without purchasing something, but many of the best paying customers a merchant can have are secured by looking after their end of the bargain, and declining to urge goods which he, himself, would not care to purchase for the purpose required. This does not imply that a merchant needs to be indolent in pushing for sales, or lacking in enterprise; it means that the merchant who can, in some slight degree, assume the position of an impartial advisor as regards the interests of his patrons will succeed where a dozen "hustlers and bluffers" would signally fail. It is all right to slap your customer on the back and ask about the health of his youngest child in an anxious manner, but it is not just the thing to injure his spine in the operation, or apply the same treatment to a bachelor.

Withholding Information.

Notwithstanding the indisputable evidence that a change of ideas is profitable, many men otherwise liberal treasure up for their own exclusive use the information derived from personal experience. It is a well-known fact that the most advanced students in all fields are inspired with new ideas from those who seek their aid, and are in return ever ready to give all information in their power. With such examples on every hand a merchant is often found who will not help another, though in a different line, with a suggestion that would save his name and business. There are many salesmen who will let another lose time and sleep accomplishing results that could be readily accomplished by a mere hint from them. There are tinners, plumbers and heating men who have learned little things, sometimes themselves, but more often from others, that they could give without disadvantage, yet withhold while seeing their fellows suffer great inconvenience from the lack of the information. Though often enough this withholding of information is due to a mean spirit, in far too many cases it is due to indifferent interest or lack of ambition. If you know something that could be as valuable to others as it is to you just see if you don't profit most in the end by giving it to several. "He has got to leave his gold where it won't melt" is often exultingly said of the despised miser, but how much more despicable

is the man whose mind is stored with golden information and who daily refuses while living to rise equal to the dead miser by leaving his hoard to become valuable to others when it can no longer benefit him.

Electric Fans.

As the summer passes we see more and more of the electric fan. It has come to stay, and seems to mitigate, to some extent at least, the oppression of a hot and stuffy room. It produces merely a circulation, not a renewal of the air, but its results are decidedly beneficial. When we look back only a decade and see the impossibility of the introduction of such a fan, simply from lack of motive power, we may more fully appreciate how rapid has been the introduction of this article of comfort and convenience. Each season brings out new designs, but all of the general type of the disk or propeller face, with motors of more varied descriptions. No great change is, however, likely to result in prevailing styles, and more thorough circulation with true ventilation (a renewal of the air) will doubtless come through the adoption of electrically driven incased paddle fans to force cool, fresh air into the apartment.

Burnt Air.

BY L. M. W.

The freqent use of the "burnt air" argument by those who find in it some advantage suggests that more light on the subject might be of advantage. Any one who will take the trouble to critically examine the subject and study authorities will find that it has been demonstrated that air heated to a temperature of several hundred degrees and afterward cooled had in no way deteriorated. If the passing of air over perfectly clean red hot plates by which its temperature was raised 1000° does not destroy its invigorating influence or vitiate it in any way, the question arises, to what is due the disagreeable experience that we all have so positively felt at times? The smell is due to dust in the air, and the fact that all dust is not gold dust leaves the reader to guess what kind of cremated dust he is inhaling, and whether it is worth while to go to some trouble to filter out this objectionable commodity. Another impression of burnt air is derived from the effects of overheated air on the mucous membrane with which it comes in contact through breathing. It also creates a stifling sensation, partially due to the fact that after a good full breath only a trifle more than half as much oxygen has been drawn in as would have been if the temperature had been half as high, for it must be remembered that air expands considerably in reaching a high temperature. Very hot air, furthermore, is ordinarily very dry and naturally absorbs moisture rapidly, leaving the throat and the exposed membrane parched and inflamed to a greater or less extent, making them very sensitive to changes of temperature. Do not malign the air by saying it is burnt, for the only thing burnt is the possessor of the imperfect hot air heating system.

Protection from Lightning.

The following article by Alexander McAdie is reprinted from the *Popular Science Monthly*, several illustrations from photographs of lightning flashes being omitted:

During the year 1891 205 lives were lost, that we know of, in the United States, east of the Rocky Mountains, directly through the action of lightning. How many were lost indirectly, and how many cases there were of shattered health and more or less permanent injury, we can only surmise. The financial loss due directly to lightning was certainly not below $1,500,000 To get at something like a commercial estimate of the damage done by lightning in the past few years in this country, I have made use of the *Chronicle* fire tables for the six years 1885–90, and find that some 2223 fires, or 1 3 per cent. of the whole number, were caused by lightning, and the total loss was $3,386,826, or 1.25 per cent. of the whole amount lost by fire. During 1892 we have a record of 292 lives lost. The damage may be estimated at as high a figure as in 1891. These losses are the more appalling when we recall that the year is virtually less than six months. Over 95 per cent. of the casualties due to lightning occur between the months of April and September. It is, therefore, quite pertinent at this time to discuss the question whether or not we are able to protect ourselves from lightning. Some five years ago the question would have been answered readily and with all sincerity, "Yes, a good electrical connection with the earth—a stout, continuous copper rod, for example—will suffice" To-day no such answer can pass unchallenged, for reasons which we shall see.

In 1888, after years of dispute, we had first settled down to the calm enjoyment of the belief that rods did protect. The Lightning Rod Conference had shown, in quite an exhaustive report, that Faraday's position (as opposed to the opinions of Harris) was correct, viz —that the problem was one of simple conductivity; that a solid rod was better than a tube or tape, which would give greater surface with less copper; that solid volume was everything, superficial area nothing; and that, provided the metallic passage afforded the flash was continuous, any flash might be successfully carried off and harmlessly conducted to the ground. This conference, while not strictly an official body, was one that, from the character of its members, carried great weight. It was a joint committee of representative members of the Institute of British Architects, the Physical Society, the Society of Telegraph Engineers and Electricians, the Metrological Society, and two co-opted members.

In 1888 came Dr. Oliver J. Lodge's remarkable course of lectures before the Society of Arts upon the oscillatory character of the lightning flash. Then followed the famous discussion at the meeting of the British Association. As this debate was one in which quarter was neither asked nor given, and the question at issue was clearly understood by all to be whether a lightning conductor, when constructed in accordance with the directions of the conference, would absolutely protect, it may not be out of place to give here a synopsis of the arguments advanced. Mr. Preece, who opened the discussion, defined the functions of a lightning conductor as twofold: "It facilitates the discharge of the electricity to the earth, so as to carry it off harmlessly, and it tends to prevent disruptive discharges by silently neutralizing the conditions which determine such discharges in the neighborhood of the conductor. To effect the first object, a lightning conductor should offer a line of discharge more nearly perfect and more accessible than any other offered by the materials or contents of the edifice we wish to protect. To effect the second object, the conductor should be surmounted by a point or points; fine points and flames have the property of slowly and silently dissipating the electrical charges; they, in fact, act as safety valves If all those conditions be fulfilled, if the points be high enough to be the most salient features of the building, no matter from what direction the storm cloud may come, be of ample dimensions and in thoroughly perfect electrical connection with the earth, the edifice, with all that it contains, will be safe, and the conductor might even be surrounded by gunpowder in the heaviest storm without risk of danger All accidents may be said to be due to a neglect of these simple elementary principles. The most frequent sources of failures are conductors deficient either in number, hight, or conductivity, bad points or bad earth connections; . . . and there was no authentic case on record where a properly constructed conductor failed to do its duty. . . . He personally had under his supervision at that present moment 500,000 lightning conductors, and, fixed throughout the offices (post office and telegraph) had apparatus protected by about 30,000 or 40,000 lightning protectors."

Dr. Lodge said that "if his views were correct, very few buildings are effectively and thoroughly protected at the present time. . . . He had read carefully the conference report, and found a large number of entire failures; . . . one noteworthy one, a brass rod an inch thick on a steeple which was smashed to pieces and the spire destroyed. Again, the best protected building in the world, the Hotel de Ville, at Brussels, on which M. Melsens had spent so much time and trouble. It was elaborately protected; protected by innumerable conductors with admirable earths made in a variety of ways, bristling with points all over the top—everything carried out in the most approved style, regardless of expense. Yet in the month of June the building was struck and set on fire. . . If a lightning conductor can prevent a flash from occurring by its repellent action, well and good; but he had shown in his lectures that there are cases where a point has no protective action whatever, when a point could be struck by a thick and heavy flash. There were other cases where the point acts with a brush or fizz and neutralizes the electric charge without a flash. They could not always do it. And so the lightning rod has two functions; one is to be repellent if it can, and the other is to carry off a flash when it cannot help receiving it. There was a certain amount of energy which they must dissipate somehow, and they could not expect to *hocus pocus* it out of existence by saying they could conduct it to the earth. The quicker they tried to conduct it down to the earth the more searching and ramifying disturbances they were likely to get. It might be better to let it trickle down slowly by using a moderately bad conductor than to rush it with extreme vehemence down a good conductor, just as it would be safer to let

a heavy weight suspended in a dangerous position down slowly rather than let it drop as quickly as possible. . . . If a man holds a lightning conductor when a flash passes down it, he will most likely be killed. . . . It did not matter about the earth; . . . a spark was likely to occur . . . he had made experiments in the laboratory with a rod very thick and a yard long, in circuit with a Leyden jar discharge. He took a platinum wire as fine as possible to make the contrast greater, and arranged it so as to make a kind of tapping circuit; if, then, the bottom end was arranged so as to be in contact with the rod and then let the top end be ⅛ inch away, then they would have a splendid conductor, better than any lightning conductor ever was. They would have no trouble about earth. It seemed absurd for any portion of the discharge to leave this conductor to jump across and make for the little strip of wire. Nevertheless, a portion of it did, and from every spark that went to the conductor, a side branch went to that little wire. . . . What are the conditions of a flash? He assumed that a flash behaved like experiments in the laboratory, but it was a question whether a cloud discharge was of this kind. A cloud is not like a conductor; it consists of globules of water separated from one another by interspaces of air; it may be compared to a spangle jar; when a spangle jar discharges, you have no guarantee that the whole of it discharges—it discharges in a slowish manner. It might be that there was with a cloud first a bit of a discharge and then another bit, and so on, so that there might be a kind of dribbling of the charge out of it, and they might therefore fail to get these sudden and oscillatory rushes. . . . But we must provide for the possibility of a sudden discharge."

Hon. Ralph Abercromby contributed to the discussion facts brought out by an examination of some 90 photographs of lightning flashes in different parts of the world. In one instance the whole air was filled with threads of lightning coming down like the roots of a tree from the sky. He thought it was very much a question where the area of protection would be when the whole air seemed to be pouring lightning down upon you. He would also like to find out whether buildings were struck during rain or when it was not raining. In connection with the fact that thunderstorms were confined to the lower ten thousand feet of the air, he mentioned the fact that in Norway there were two kinds of thunderstorms: one occurred in the summer, he believed, when the lightning clouds were high, and very little damage was done; on the contrary, in winter time the clouds were very low, and the churches were frequently struck.

Lord Rayleigh, Sir William Thomson and Professor Rowland discussed the questions whether or not the experiments actually represented the actual conditions. M. de Fonveille called attention to the most extraordinary lightning conductor in existence, the Eiffel Tower, and the fact that Paris was practically free from calamities produced by lightning, because a sufficient number of lightning rods had been erected according to the principles advocated by the many official boards, substantially the same as the conference. Prof. George Forbes thought a copper alternative path better than an iron one. Sir James Douglas, speaking from an experience of 40 years with a large number of conductors, was of the opinion that the rods, when properly constructed, were entirely adequate. In the matter of copper *vs.* iron he pointed out the practical consideration that iron corroded rapidly compared with copper. Mr. Walker further pointed out that this corrosion of iron was not a question of weather alone, but, as in the case of the top of the chimney of a factory, there would be some chemical action. Mr. Symons brought out with respect to iron conductors that galvanizing would not entirely overcome the difficulty.

(To be continued.)

WORLD'S FAIR NOTES.

E. W. Bliss Company

of Brooklyn, N. Y., and their Stiles & Parker Press Company, make a very large and interesting exhibit of presses, dies and special machinery for working sheet metal at Column L 42, in Machinery Hall. All the machines shown are belted up and can be put in operation for the instruction of visitors. They comprise specimens of the Nos. 3½ and 14 Bliss toggle drawing presses, Nos. 18, 19 and 21 Bliss adjustable power presses, No. 95½ Stiles straight-sided double-crank press, two Stiles drop hammers and Nos. 0, 1, 2, 3, 3½, 4 and 5 Stiles power punching presses. The No. 14 toggle drawing press is a huge machine used in the manufacture of large sheet metal ware, weighs 70,000 lbs., will take in a blank up to 44 inches in diameter, and will draw to a depth of 14 inches, making 7 strokes per minute. This machine, however, is not the largest built by the company. Their No. 209, not exhibited, takes a blank 60 inches in diameter and draws to a depth of 18 inches. The No. 3½ press takes a blank up to 20 inches in diameter and draws to a depth of 5 inches. The two presses shown serve their purpose in illustrating the system on which these machines are built. Cams are entirely dispensed with, the blank-holder being operated by means of toggles. According to the size of the press, one or two rock shafts are used to which the blank-holder slide is connected by means of toggle links. These rock shafts are operated from the main shaft by a peculiar system of link work which imparts through the blank holder a thoroughly uniform pressure to the blank. The strain arising from the pressure put upon the blank is transferred through the straightened toggles directly to the frame of the press instead of falling on the main shaft. In the larger sizes the company's new automatic friction clutch is used. Its action is practically instantaneous, avoiding entirely the heavy shock which, in the regular clutches, tends to destroy the clutch parts, frequently causing expensive delays and repairs. The adjustable power presses are specially adapted to cover nearly every kind of blank cutting, perforating, forming and combination die work, covering a large proportion of the operations needed in the manufacture of cans, pieced tinware, brass goods, trimmings, &c. In the presses shown there is a knock out attachment for discharging the work from the upper die, thus dispensing with springs, which often prove unreliable. The large double-crank press exhibited is intended for operating very large but accurate cutting and perforating dies, as, for instance, for armature rings, and is built very solidly and substantially. The drop hammers shown are of two styles, one being intended for forging, embossing, design stamping and other work requiring the dies to be keyed in the bed, while the other is adapted to sheet metal stamping. The power punching presses, of which such an extensive line is shown, are adapted to nearly every kind of blank cutting, punching, perforating, forming and bending, covering a large proportion of the operations needed in the manufacture of hardware, locks, cutlery, guns, sewing machines, typewriters and other articles made out of sheet metal. The pitman is made of steel, the crank pin runs in gun metal bushings, and the presses are further fitted with the Stiles eccentric adjustment, permitting rapid and very accurate adjustment and transmitting the pressure entirely through solid metal instead of throwing it upon screw threads; also with a patent graduated adjustment marked to $\frac{1}{100}$ inch, and with the Stiles automatic clutch, which allows the shafts to be turned for setting dies while the wheel is in motion without endangering the operator. In showcases samples are exhibited of the work done by these machines, covering a very great variety of shapes in different metals.

Jarecki Mfg. Company

of Erie, Pa., have an exhibit of pipe-threading and cutting tools at Column K 47, Machinery Hall. Their exhibit is very tastefully arranged, the large threading machines being placed along the sides of the space, while in the rear a pyramid of shelves has been built to hold pipe fittings and specimens of the work done on the machines. A unique arch, formed of threaded cast-iron pipe, fittings and branches, has also been built across the rear, towering above the pyramid. The machines shown are designed to cut and thread pipe from ¼ inch to 12 inches in diameter. They are operated in a variety of ways. Some are driven by hand, others by electric motors, some by belt from the exposition power plant and others by attached engines. They are shown in actual use and receive much commendation from pipe fitters for their ease of adjustment, convenient arrangement and good work. The dies are quick-opening and adjustable, each set of four pieces cutting two sizes of pipe. A large assortment of the Jarecki screw plates and pipe cutters is also shown.

One of the features of the exhibit is a showcase containing highly polished specimens of valves, nozzles, oil cups and other goods, arranged in a most attractive manner.

Photographs on Marble.

A German photographic journal gives the following particulars of a process used by a Mr. Villion for transferring photographs to marble: Coat an unpolished plate of marble with the following solution: Benzine, 500 parts; spirits of turpentine, 500 parts; asphaltum, 50 parts; pure wax, 5 parts. When dry, expose under a negative, in sunshine, for about 20 minutes. Develop with spirits of turpentine or benzine, and wash in plenty of water. Then cover the plate where it is intended to be left white with an alcoholic solution of shellac, and immerse the same in any dye which is soluble in water. After awhile, when enough of the coloring matter has entered the pores of the stone, it should be taken out and polished. The effect is said to be very good.

THE LETTER BOX.

Squared Roofing Tin.

From W. H. B., *Monroe, N. Y.*—"J. L." in *The Metal Worker* of September 9 makes a very happy suggestion in requesting that corners of roofing plates be clipped before coating. My suggestion that they be then edged and packed in boxes, ready for laying, was not intended to cover the whole output of terne plates. Many roofers, I have no doubt, would be pleased to know that plates clipped, coated and then edged, and packed ready for laying "flat-seam" work, were to be had by simply specifying them, instead of the usual flat plates. I predict that some enterprising manufacturer or jobber will offer plates "ready for laying" to those who desire them. All other kinds of "ready roofing" are already offered.

Sheet iron edged and packed, ready to lay, continuous tin roofing, eave troughs, conductor, elbows and cornices, ready made, are at hand; why not have "flat-seam" roofing clipped add edged ready for use also? It is hardly likely that a roofer will clip and edge a lot of plates at "odd times" when the first job that may present itself is one requiring a standing seam.

A large proportion of plates are ordered from jobber or manufacturer after the kind and style of roof are determined upon. The plates are often directed to be shipped direct to the job, and may never see the inside of the roofer's shop, but even if they did, would not "J. L." find it a convenience to buy them ready to lay, if costing no more or perchance less than if he prepared them?

Objections raised on account of lack of uniformity of width of edges turned would seem trifling, as flat-seam folders have so long been in use that the size of the fold has long since been established.

The new quadruple folder will no doubt follow the established order of things. At any rate the plates ordered for any specified roof could be relied upon as to uniformity in width.

The additional expense incurred by increased size of package to hold the sheets edged should be trifling, and the freight charges but little, if any, more. The weight of sheets folded must be the same as if flat, and only an additional weight of wood need be considered in reckoning the freight charges.

Gas Tar For Roof Paint.

From S. & H., *Watsontown, Pa.*—Will you please answer, through *The Metal Worker*, whether or not gas tar is a good paint for a sheet-metal roof?

Note.—This subject has been often discussed in the Letter Box, the latest time in April, 1893. A strong general impression exists that gas tar destroys rather than preserves tin roofs, though some have been brought to notice that have had many coats and are still in good condition. A sufficient number of layers of tar or any other water-proof material will make a rain-proof roof of itself and obviate the need of any other impervious coating. A roof made of fine wire netting might be coated with tar so as to shed water for a time as completely as a new tin roof. But as a preservative of the tin, which is the true purpose of paint or other material, gas tar is not to be recommended.

Safety of Steam Heating Boilers

From J. A. D., *Michigan.*—I find people in this part of the country using horizontal wrought iron or steel tubular boilers in some of the best residences. They are generally placed in the center of the basement in houses of from 40,000 to 80,000 cubic feet of space. I have heard of a church in Indiana and a hotel in Connecticut and also a house that were blown to pieces. Do you think there is any danger from these boilers on account of the ignorant attention they may receive from the servants in a household?

Note—From a practical standpoint we do not think there is any danger in steam heating so far as explosion is concerned. The boilers are built amply strong and every provision is made for preventing accident. Furthermore, the pressure used in ordinary steam heating is so very low that there is a very remote chance of the boiler exploding. We do not recall the instances referred to by our correspondent, but we should advise him not to be worried by such reports. Our correspondent would undoubtedly feel perfectly safe in using a range boiler and water back, and yet we presume there are ten fatal accidents due to the explosion of the water back in cold weather by the stoppage of the circulating pipe to one accident due to the bursting of a steam heating boiler.

Source of Air Supply.

From L. M. W., *Delaware.*—Reading the article on "Furnace Heating and Air Supply," by Oscar Weiderhold in a recent *Metal Worker*, suggests another advantage that might be gained from the use of the fan. The air at the top of a building is pure and free from dust compared with that near the ground. If the shaft or box that carried the air supply to a furnace had its receiving point near the top of the building a less quantity of dust would be taken in. Any possibility of warm air being drawn from the furnace and sent out of doors would be prevented by the action of the fan. The top could be arranged with an ornamental cover to keep out rain and snow and a wire screen used to prevent birds and other things from getting in. The cleaner air supply would obviate the necessity of an air filter made of cheese cloth, as is sometimes used, that not only requires to be frequently changed, but also acts to some extent as an obstruction, particularly when clogged. The odor of "burnt air" would be forgotten, if no dust come in contact with the hot furnace. The housemaid would have less use for the feather duster, and many ornaments and articles of furniture would preserve their freshness for a longer period, to say nothing of the satisfaction of knowing that one was breathing clean air. Whether the electric fan and taking the air supply from a high point can be made practical and satisfactory in use may be easily demonstrated. Even if successful, it does not necessarily follow that the practice will become general, though their use may be occasionally adopted where the advantages are considered sufficient. The purity of the air that is supplied and the constancy with which a good volume is furnished, free from dirt, is a matter worthy of consideration by the heating trades.

Single vs. Double Heating Pipes.

From W. E., *Orange, N. J.*—What benefit is derived from covering the studding with tin in partitions in which furnace pipes are run? There are always a number of places left untinned through which the wood could catch fire if such a thing were possible. Even the shavings which are liable to fall against the heating pipes will not burn. Is not iron lath in furnace work unnecessary?

Note.—For the purpose of securing the ideas of those in the trade regarding the above questions, the letter was handed to two heating engineers, whose answers are given below. We should be pleased to have our readers give their views regarding the questions propounded by our correspondent, as the subjects mentioned are of interest to many. The first answer is as follows:

"When single heating pipes are run through partitions, the exposed studding are covered with tin to protect them from the heat radiated from the heating pipes. If the covering does not come in close contact with the wood, the air space thus formed is an additional protection. It is true the efficiency of the covering would be greatly lessened if openings were left as described by the correspondent, but it is supposed a skilled furnaceman would do his work in such a manner that openings would not be left. If shavings can lie against a heating pipe without burning, it simply goes to show that the pipe in question was not hot enough to ignite the shavings. This would not prove by any means that single pipes could not be heated sufficiently to ignite wood. When pipes are run through partitions the custom with most furnacemen is to make the pipes as safe as possible. On this account the pipes are made double, and in some cases covered with asbestos paper. As wooden lath are liable to come in contact with the sides of heating pipes, as an additional protection some form of iron lath is used, that the danger from fire will be reduced to a minimum. Regarding the danger

from fire when single heating pipes are brought in contact with wood, by the application of heat for a long time to wood, even though the temperature be not much above that of boiling water, wood becomes so baked and charred that it is liable to ignite spontaneously, or burn with great rapidity when fire is accidentally applied. The melting point of tin is given at 442°. If the single partition pipes are heated sufficiently to melt the tin coating, or to cause the surface to turn black, it will be seen that the wood work is exposed to a temperature of 442° or over. It has been stated that wood exposed to a pipe heated to a temperature of 300° for about six months was found to be charred to a depth of ¼ inch, which goes to show that single heating pipes should not be brought in close contact with wood."

The second answer, referred to above, is as follows:

"For some time after furnaces came into use in this country dealers were afraid to run pipes to the second stories of dwellings and other buildings, fearing disastrous consequences in the shape of fires, and it was a long time before the furnaceman dared to consider means of supplying the heat to the upper floors of buildings. Single pipes were first used for the purpose and run up in the corners of rooms and often exposed, though occasionally protected by wall paper or screens. Later single pipes were placed in partitions of buildings, but made very small, and the studs were protected by pieces of tin nailed thereon, virtually forming a double stack; but this method proved unworkmanlike and also expensive and at a later date wire lath or metal lath came into use and was placed on studding between which hot-air pipes ran. Another step in the advancement of the work came when asbestos paper was manufactured and dealers began gradually to wrap the single pipes with asbestos paper. This was a long step in advance, but was not perfection by any means, for the reason that it was found frequently that the rats and mice gnawed off the asbestos paper, leaving bare the stack and thus facilitating the radiation of heat. Finally came the double stack, or one stack within another with an air space between, reducing the danger (if indeed there was any danger) from fire to the minimum, and furnishing an economical and satisfactory pipe for the conducting of hot air from the furnace to upper rooms. In actual use it has been discovered that a double hot-air pipe will convey a very much larger percentage of heat than will the single pipe wrapped with asbestos paper or protected by wire lath, and as now made by machinery the double pipe is furnished to the trade by the leading makers of furnace fittings at a lower cost than the single pipe alone could have been produced a few years since.

"One advantage that is evident in the case of double pipes is that there is an absolute freedom from danger from fire. No cases are on record where a double pipe properly put in has caused a fire directly in the building; but it is true that a single pipe radiates a large amount of heat into the partition walls and dries the wall to such an extent that in case of any fire in a building this dried-out partition quickly spreads the flame and adds to the fury of the conflagration. Inasmuch as fires in houses frequently originate in the basement, where shavings, oil or rubbish are found, it often happens that the fire finds ready access to the partitions in which the hot-air pipes run, and these partitions are converted into so many flues for the spread of the flames.

"The amount of heat conducted by the double stack is fully one-fourth greater than that conducted by a single stack of the same size, showing the excess of radiation from the single stack. While wrapping such stacks with asbestos paper, either single or double thickness, reduces this radiation, it has been found that no matter how well wrapped with such paper, there is still an appreciable loss of heat from the single stack. The only merit that can be claimed for the single stack is that space is saved and a larger stack can be used for the same partition, but this is a fancied advantage only for the reason that the larger stack will not conduct any more heat than will the smaller stack, owing to the reasons set forth above. The custom of covering the studding in which hot-air pipes run with metal lath is fast going out of use, owing to the fact that the cost is much greater than where double stacking is used and with no attendant advantage, and in many smaller places it is difficult to procure such lath of suitable width, and loss is the result where this work has to be done."

Question in Plumbing.

From C. E., *New York.*—I want some advice on a plumbing job that I am called upon to do. A customer, without consulting me, had built a brick vault under his kitchen to receive deposits from soil pipe, one side of the vault having a large inlet for the water to run in and through it, and a 6-inch tile at the other side connecting with a water sluice way. He intended to leave the vault open at the top, but I told him if he insists upon using it he must close the top of the vault. I propose to dispense with the vault altogether and use simply a soil pipe with a running trap in the ground and an inlet at the elbow at the foot of the perpendicular soil pipe.

Answer.—Our correspondent incloses a rough sketch, from which it appears that a supply of water from a pond is running continually through the vault, carrying the soil out through a drain into the water sluiceway. The reason for the vault we fail to understand, and agree with our correspondent that it would be wiser to run a continuous pipe to the sluice, connecting at the elbow to another pipe from the pond, which would keep the main drain constantly flushed. The objection to the vault would be the same as to the old-fashioned traps, which were of such large capacity that they never were properly cleansed or flushed, but remained veritable cesspools in the plumbing system.

Wants a Rule for Finding Capacity of Furnaces.

From H. W. K., *Jacksonville, Ill.*—Will you give in the *Metal Worker* a rule for finding the capacity of hot-air furnaces? If you could give the rule used by the manufacturers I would be obliged. I have received a great deal of valuable information on furnace work, but have looked in vain for such a rule.

Note.—We know of no such rule, but can appreciate how valuable it would be to furnacemen. No doubt one rule would not apply to all constructions, and much difficulty would be met in formulating rules that would, but this should not prevent the progressive furnacemen from making the attempt. Impressions and experience tending to such an end could be exchanged with advantage in the Letter Box.

Method of Connecting Boilers.

From W. N. S., *Ansonia, Conn.*—I would like to know if there is any objection to connecting up a boiler by taking the hot-water pipe from the water back to the top of the boiler, and connecting it there by a T-joint? I know that it is not the general way, but is there anything about it that will hinder it from working? Hot water would come much quicker and direct from the water back, and I can see no reason why the boiler would not heat as well as by the old plan of connecting at the side.

Note.—This method of connecting a boiler is not new and has been tested with satisfaction by many. One plumber used a trap having a drop of 2 feet in the upper pipe connected in this way, to demonstrate to a skeptical friend that it would not hinder circulation or heating. Some difference of opinion exists on this subject, which was discussed in *The Metal Worker* in the spring.

Heating Coil Outside of Fire Pot.

From J. R., *Chambersburg, Pa.*—Will the readers of *The Metal Worker* give their experience and opinion whether a coil of pipe put around the outside of the fire pot of a brick-set hot-air furnace will heat the water enough to warm a room by means of a radiator? The cold air that comes to supply the furnace would play right on the coil. Whether such an arrangement would be successful is something I cannot tell, and I thought that if anybody had tried such a plan I would like to know of it, for I never heard of anything of the kind.

According to a recent report of the Paris Gas Company, the consumption of gas in Paris during the year 1892 was 3,500,000 meters less than in 1891. The decrease is wholly in the night service, the day consumption for cooking, gas motors, &c., showing an increase to 27 per cent. of the total consumption. The increasing use of the electric light is given as the cause of the falling off in the volume of gas used for illuminating purposes.

PLUMBING and GAS FITTING.

The Chicago Master Plumbers.

The Chicago master plumbers held their regular meeting Monday evening, September 11, at their hall, 197 Madison street, President T. P. Culloton in the chair. There was a large and enthusiastic gathering of the members, many of whom had returned from their vacations and were consequently filled with renewed vigor and old-time energy. Considerable discussion was indulged in regarding the methods of testing house drainage and ventilating pipes. Attention was called to the fact that while iron soil and waste pipes and their connecting ventilating pipes might be made perfect and able to withstand the tests applied to them, a building could not be considered to be in a good sanitary condition when tile sewerage pipes were used within its confines. Considering the reports regarding cholera, it was recommended that the sewerage and catch basins connected with each building should be put in the best condition possible.

Trap Ventilation.

We have the following communication from M. W. Hopkins, B.A.Sc., C.E., resident engineer to the Hamilton Sanitary Association, at Hamilton, Ontario, and who was formerly assistant engineer to the Montreal Sanitary Association:

The articles on "Trap Ventilation," by Mr. Glenn Brown, F.A.I.A., and Mr. Wm. Paul Gerhard, who seem to differ somewhat on the advantage of back vents for traps, have been very interesting for two reasons: First, because of the knowledge we acquire in reading them, and second, because it shows us that high authorities can differ on vital points. The question is a very important one because, as Mr. Gerhard says, it costs money to ventilate traps when they are scattered throughout the house. If, however, it is necessary, we should not allow this cost to deter us from doing it. If it is not necessary, there is money saved.

In writing reports on the sanitary arrangements of old buildings this feeling has come very strongly to me. There are many cases where it bothers me to decide whether to recommend a vent pipe to be taken from the trap or not. My conscience will be pricked whichever I do. If I do, it will cost the owner considerable money. If I do not, I perhaps haven't done my duty.

The three objections Mr. Gerhard gives in *The Metal Worker* of September 2 seem to me not to have so much force as would at first appear His first objection only applies to old buildings and very high buildings. Now, if it is good in a new building, it is good in an old building, the only objection being in the cost. Of course, if the cost is prohibitive it must be done without, on the same principle that a poor man would rather submit to having the air he breathes seasoned somewhat with sewer gas than pay to be free from it; or he would rather live on mush and milk than pay for roast beef, &c., although he would willingly admit that the latter was better.

Then we will all agree that there will be a certain hight of houses that will prevent vent pipes going separately through the roof or joined into the soil pipe above the highest waste connection; also we will admit that we can easily picture to ourselves old houses with fixtures scattered throughout where a man of ordinary means would rather do without trap ventilation than pay for it, or we may conclude that a poor man would generally willingly do without trap ventilation in such cases. But then we have to consider that poor men do not have fixtures scattered throughout the house, nor do they build very high houses, and then for the highest houses in New York or any other city the separate ventilating pipe passing up through the roof need not be so very large, and if this vertical pipe received no waste connections, the vent pipes from each story could be joined directly into it, and the expense would not be so very great. Again, large houses are usually inhabited by wealthy men who can afford surely to have the sanitary arrangements of their houses perfect if they can afford to drink champagne and keep an army of servants. Then it would seem that if it is better to have trap ventilation the cost should not prevent its use. Poor men generally have only a few fixtures and those close up to the soil pipe and only on one flat, so that the trap vent can be joined into the soil pipe just above the fixture.

Also the objection to having trap ventilation in old houses with fixtures scattered throughout holds if there is no trap ventilation, for then there are long dead ends, which Mr. Gerhard objects to, and water closets would have to be ventilated any way in such case. So such buildings should have trap ventilation, according to the above authority. Then this objection will hold for high buildings also, unless the fixtures are grouped close around the soil pipe or waste pipe, as the case may be. If that is the case it would not cost much to run a separate ventilating pipe up alongside the soil pipe and join it into it above the highest waste connection.

His objection No. 2, given in *The Metal Worker* of above date—namely, that a vent pipe increases the evaporation in the trap—should not have much weight, for if the fixture is not used all summer the trap will become unsealed any way; and if the fixture is not left unused for some such period of absence of the residents the traps, if ventilated, will not unseal, if they have a proper seal to begin with.

As to objection No. 3, it is very rare indeed that the vent pipe becomes stopped up from splashings from the trap, so it would seem to be worthy of little weight.

It seems to me that there is another reason why traps should be ventilated and that is that then the smoke test or other test can easily and thoroughly be applied to the whole system periodically. It is almost impossible to test a long dead end with the smoke test in reasonable time, unless the leak is very large, for the smoke will not go up the pipe if there is no hole at the other end. This is, also, it seems to me, a very strong reason for having an intercepting trap on the main drain. If there is no trap the smoke test will not be of much use and no other test can be applied to the pipes of an old building as thoroughly and well.

This would seem also a very good reason for placing the intercepting trap outside of the foundation wall and not inside, as is recommended in most of the plumbing by-laws of cities. In a great many of the houses I have tested I have found leakages in the drain just where it passes through the foundation wall, caused by settlement of the building or from neglect to make the joints in this part well. Now, if the trap is inside of the wall, when the drains are periodically tested with smoke, &c., these leakages will not be detected. Whereas if the trap is placed outside of the wall and some distance away from it, all the drains in and near the house will be properly tested if there is a proper fresh-air inlet just inside of the trap.

I consider this a thing worthy of much consideration, for I very often find a serious leakage at this point.

Plumbing for a State Normal School.

We are indebted to Richard Horstmann, Sanitary Inspector of Public Schools, New York City, for the following description of some excellent plumbing work, executed under the direction of a recent graduate of the New York Trade School:

Knowing your great interest in everything pertaining to plumbing, I take great pleasure in writing a few lines about some good work I saw on a visit to Pennsylvania. Saturday afternoon, August 12, I started with my family to spend Sunday at Stroudsburg, Monroe County, Pa., near the Delaware Water Gap. While in Stroudsburg I was invited to visit and inspect the new State Normal School, costing $100,000. This being a school building, interested me all the more. The building itself is a stately structure. Of course the plumbing interested me most, and reflects great credit both upon the contractor, George E. Stauffer, and the young man who drew up the specifications, John Ingram, Jr., representative of Louis Waefelaer. The following will probably interest members of the New York Trade School, as he was a graduate of the class of 1887. It appears the school trustees only purchased plans and specifications for carpentry and mason work, and when the building was about completed they decided to have plumbing. Hearing of Mr. Ingram, they invited him to draw up specifications and plan locations of 33 syphon closets, 10 porcelain enameled baths, slop sinks, washstands and slate urinals. I saw a copy of same, and they are first class; nothing extravagant and right to the point. Contract called for completion of job by August 26. It was started July 17, and finished on time, Mr. Ingram having supervision of the job.

To be brief, I will only mention that good judgment was displayed in providing extra lines of vent pipes from the dead ends of the horizontal soil and waste pipes, which are located in the basement, first, second and third floors, thus allowing a full circulation at both ends.

The closets are on one side and the bathtubs and basins on the opposite sides of the rooms. The dead ends of soil pipes connect into a 3-inch and the dead ends of the waste into a 2-inch line on each floor, terminating in attic, where they are connected together with the main risers into an 8-inch pipe, carried through peak of roof. There are two dormitories to the building, one for males and one for females, the arrangements of pipes being alike in both, thus avoiding having a number of pipes coming through the roofs (which in no case are an ornament to a building with a peak roof).

Brass screw ferrules have been inserted on these lines and wherever practical throughout the building for cleaning purposes, in case of stoppages, thus avoiding endless trouble and expense should a stoppage take place, Pipes from leader traps outside of building have been extended to top of ground, with screw ferrules inserted, so that in case of a drought they can be filled with water. In the attics of these dormitories are two 1000-gallon wrought-iron tanks, supplied from street. Then 2-inch fire taps are arranged on each floor, and supply pipes so arranged that all fixtures can be controlled separately by means of stop cocks.

Taking into consideration that the building was about completed, and no allowance made for plumbing, the trustees are to be congratulated upon their choice in selecting Mr. Ingram to take charge and give them such a fine plumbing job.

Chicago Plumbing Regulations.

November 30, 1891, the City Council of Chicago passed an ordinance relating to plumbing, Section 12 of which is as follows : " When required by the Commissioner of Health all work must be tested by such test as this department decides upon, and in the presence of the inspector. Defective pipes must be removed and all defective work made good and conform to this ordinance." In conformity with this ordinance the Department of Health has sent out the following circular to those interested :

" On and after November 1, 1893, Section 12 of the ordinance relating to plumbing and drainage will be enforced in the following manner :

" When the soil, waste, vent, revent and all other pipes (within building) connected or to be connected with sewer are placed in position, they shall be tested by water in the presence of an inspector of this department, and upon completion of building a second test by peppermint shall be applied before work will be accepted by this office.

" Certificates of tests and inspection will be issued by this department. Architects and other interested parties are advised to demand said certificates before acceptance of said plumbing and drainage work."

TRAPS AND VENTS.

THE CATALOGUE of the Glauber Brass Mfg. Company of Cleveland, Ohio, for 1893 is being distributed to the trade. The cover is dark green, with the firm's name and address embossed in silver bronze, and a view of their building on the back. The title page proclaims that they make a specialty of manufacturing high grade brass goods for plumbers, steam fitters and engine builders, and are the sole makers of Glauber's patent stop and waste cocks, basin clamps and hose bands. The introduction states that only the Glauber brass composition is used in their goods, which, with the features of excellence, has created a demand that required increased producing facilities. These they say are found in their new quarters, which are claimed to be among the largest and most complete brass manufacturing plants in the country. Following the introduction are 50 pages of text and illustration showing the adaptation of the Glauber patent to all forms of cocks. Next are noted compression bibbs, basin cocks, unions, &c. Then the Magic basin clamp, made to fit any kind of a bowl, and an adjustable basin clamp are referred to. Next are rubber connections for plumbers' hose couplings, nozzles and Glauber's patent hose bands. These are followed by a variety of steam valves, water gauges whistles, air cocks, gauge cocks, brass and glass oil cups and lubricators. The last page is devoted to the Keystone union, made of iron with a soft metal seat, which can be used for either hot or cold water work and a tight joint made without a perfect alignment of the pipes.

A PLEASANT CALL will be missed by the plumbers who fail to be in when visited by the representative of the Glauber Brass Mfg. Company, Cleveland, Ohio. A. M. Buchmann is now in the West, and J. H. Glauber in the East, for the purpose of explaining the merits of their high-grade goods, and their specialties, the Glauber patent stop and waste cocks, basin clamps and hose bands, and other standard brass goods. The 1893 catalogue of the firm is ready for distribution.

CERTIFICATES OF COMPETENCY have been granted to Bailey & Knott, Wm. H. Demarest and H. C. & J. E. Sowle by the Examining and Supervising Board of Plumbers and Plumbing of Gloversville, N. Y.

IT IS SAID that Wm. McCoach, a well known Philadelphia master plumber, has now become a builder.

HARRY ROBBINS of Maplewood, Mass., has transferred his plumbing business to Reagh's Block.

THE WAYS AND MEANS COMMITTEE who are to provide the Buckner Orphans' Home at Dallas, Texas, with the necessary plumbing and heating arrangements free, have added to their list of members Walter Donovan, D. F. Sullivan, John G. Hunter, H. H Jones and F. A. Campbell.

A UNITED STATES PATENT has been granted to Frederick Tyers of Nottingham, England, for an improvement in molds for making plumbers' joints. The invention relates to making branch or T joints for connecting lead or composite pipe or fittings. In carrying out the invention the piping and the end of the branch or fitting are prepared and tinned in the usual manner and placed in a position where they are held by a mold of special construction, formed with a large recess corresponding to the size and shape it is desired to make the joints. The molten metal is then poured into the mold so as to fill the enlargement, which metal when set is securely attached to the piping and branch or fitting, after which the mold may be removed.

THE G. W. DAVIS PLUMBING COMPANY of El Paso, Texas, is one of the largest plumbing houses in the Southwest, and is composed of G. W. Davis, B. T. Davis, his son, and Eugene Murray. G. W. Davis brings to the management of the business 15 years of practical experience and a wide acquaintance with the latest improved materials. They will carry a large and well-assorted stock calculated to execute small and large contracts for their customers and builders with promptness. The company are now engaged in completing one of the finest plumbing jobs in that section, having contracted to provide the fixtures and do the plumbing at the new Twelfth Company Post, Fort Bliss, for $36,000.

HOWARD R. SHEPPARD of the stove manufacturing house of Isaac A. Sheppard & Co., Philadelphia, has taken out a patent on circulating boilers. It is intended for use where the boiler is set horizontally. The connection from the water back can be made at the middle of the boiler, or in another style at one end. In one form it consists of the usual head with a flange to receive the boiler shell, but has two openings on the circumference to receive the pipe connections. A chamber is cast in connection with one of the openings that has an opening near the top of the boiler. When the connections are to be made at the middle of the boiler the casting is a circle with flanges on each end to receive the boiler shell and openings for the pipe connections. With one of these openings a chamber follows the shape of the casting and opens near the top. This is to promote circulation, deliver the hot water at the top of the boiler with little loss of heat, and to reduce the cost of connections.

CERTIFICATES have been issued by the Board of Plumbing Examiners at Los Angeles, Cal., in addition to those already issued, to the following master plumbers : C. H. Wotton, James Burk, L. C. Lowman, W. E. Warden, Ed. Brown, H. Gersen, Thomas M. C. Bradley, Alexander Stewart and William Newell. Journeymens' certificates were issued to O. C. Beach, M. Burns, Alexander Campbell, J. R. Armstrong and Frank Craycroft.

WATSON & PEALE, a firm of Philadelphia plumbers, are giving their attention entirely to custom work, and have no contract work on hand.

NOTICE is issued to the trade under date of September 7 by M. H. Loftus, North Adams, Mass., that he has bought out the interest of his late partner in the plumbing and heating business heretofore conducted under the firm name of the Lucey Plumbing & Heating Company, and will hereafter carry on the business at the old stand, 25 Center street, under the firm name of the Loftus Plumbing & Heating Company.

D. M. KEITH of the Hughes & Keith Plumbing and Chandelier Company, Denver, Col., while on his way East stopped in Chicago to visit the World's Fair and to renew his acquaintance with old-time associates.

F. J. MCCORMICK, a prominent plumber of Dayton, Ohio, has been in Chicago attending the World's Fair.

O. D. PECK, secretary of Peck Bros. & Co., has returned to Chicago from his visit East.

T. B. BUTTERWORTH, secretary of the San Francisco Master Plumbers' Association for the past seven years, called last week at the rooms of the Chicago Master Plumbers.

A NOVELTY in the way of plumbers' pots for lead and solder has been patented by Charles Brush of Newburg, N. Y. The specification points out the waste due to the oxidation of the molten metal, which forms an oxidized layer that has to be removed from time to time. To overcome this difficulty he has designed a melting pot with a floating seal, composed of metal or other suitable material. This is slightly smaller than the inside diameter of the pot, and is concave on the upper side, with a hole through the middle. By pushing down the seal with the ladle the metal rises into the hollow, and a ladleful can be taken out. On removing the ladle the seal rises and cuts off the air from the melted metal.

STEAM AND HOT WATER.

The Eureka Automatic Radiator Relief Valve.

The accompanying illustrations show sectional views of the Eureka relief valve for steam or hot-water radiators, manufactured by Hodge Brothers, 15 Chardon street, Boston, Mass. The valve is made in two styles, Fig. 1, with bottom inlet, for coil, indirect radiators, steam traps, &c., and Fig. 2, with side inlet, for radiators. The valves are made of cast brass, the shells screwing on to the base, which has a lead seat,

The Eureka Automatic Radiator Relief Valve.—Fig. 1.—Valve with Bottom Inlet.

there being no soldered joints. The cap screws on and can be set up with pliers so no one can get to the adjustments to tamper with them. The float is hollow and closed, so that it rises at the least water, and as the valve stem is attached to the top of the valve, it closes when the water approaches. The expansion tube is made of hard rubber.

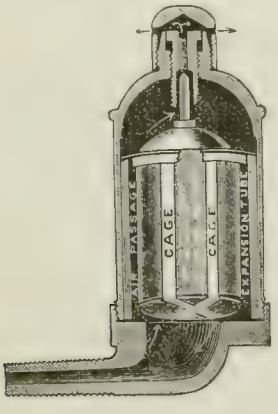


Fig. 2.—Valve with Side Inlet.

The cage which holds the float is suspended from the top of the cylinder and as soon as the heat reaches the valve closes the same by expansion from the escape of steam, so it is pointed out there is never any leakage of water or escape of steam, the valves being automatic in their work. They are tested at the factory to 100 pounds pressure and adjusted to close by heat as soon as it reaches the valve and against the leakage of water as soon as it reaches the float. The valves are adapted for use on either steam or hot-water systems or the combination of both. By their use the air is permitted to escape as soon as the pressure is turned on, so that instant circulation is the result and no noise is occasioned in the heating system. The bottom of the cage being larger than the float prevents the inrush of air or steam from striking the float to raise it by pressure.

The Wm. H. Page Boiler Co.

of Norwich, Conn., are now prepared to show to the trade a full line of their steam and hot-water boilers at 484 Pearl street, New York. The windows are lettered in white, calling attention to steam and hot-water heating apparatus, and display a No. 1 Volunteer hot-water boiler and an array of radiators. On the sample floors the Volunteer steam and hot-water boilers are arranged on the right and the All Right line on the left. A feature claimed for these goods, particularly the Volunteer, is the ease and quickness with which they can be erected and the few joints required. Special attention is called to the superior fitting of the draft and feed doors. All are provided with their patent regulating device which was found to give excellent results during the past winter. The fire-pot section of the volunteer is made with projecting pins which are said to prevent ashes from collecting against this surface, to promote combustion and absorb heat more freely. Quite a strong point is made of this feature. Another practice followed with the Volunteer steam boiler is to tap one of the water sections and heat a radiator that is below the water level in the boiler with hot water. This they say is done with universally satisfactory results when the radiator and all of the piping is below the boiler water line. A new size of the Volunteer is the No. 12, which has a 36-inch fire pot and is expected to develop a capacity equal to their large sectional boilers.

The waterways and flue spaces are ingeniously contrived to promote circulation and to realize the heat from the products of combustion, while they have free passage to the chimney. The same care has attended the development of the All Right boilers, which are made for setting in brick. One of their features is the oval fire-pot section and crown, which is all cast in one piece, and quite a skillful bit of foundry work, in addition to many advantages from a heating standpoint and freedom from joints. The Volunteer boiler, for hot water, is made in seven sizes, to supply from 200 to 1200 feet of radiating surface. For steam the smallest size is omitted. The All Right boilers for hot water are made in four sizes with fire pot of same diameter in inches as their numbers, which are respectively 18, 21, 25 and 30. They are rated to supply from 300 to 1500 square feet of surface. For steam boilers are of the same numbers and dimensions.

HEATING NOTES.

President Bond of the American Radiator Company, Chicago, has been making a visit to the Boston and New York offices.

L. J. Libby, who for a number of years past has sold the Spence boiler on the road in New England, has severed his connection with the American Boiler Company and accepted a position with the well-known firm of Olds & Whipple, Hartford, Conn., to take charge of their heating and ventilating department.

The United States Heater Company, Detroit, Mich., continue their enterprising system of advertising circulars, the last issue of their Postal Traveler announcing that they have not left the road, but have been busy during the late financial disturbance in bringing out a new boiler which they offer the trade under the name of the Hecla steam boiler, and which they describe as a modification of the well known Capitol hot-water heater. The same front and back are used, and the same grate and ash pit. The differences are the steam gauge and other trimmings which are not used on the hot-water heater. The interior water sections, however, have been changed to adapt them for steam. The middle waterway of the Capitol has been increased in depth in the Hecla so as to give increased steam and water space, and in order to make ample allowance for the fluctuation of the water line. The most notable change in the Capitol, however, is the enlargement of the water leg and the outermost water tube, of which it is a continuation. There has likewise been introduced into this outer water space a diaphragm for the purpose of providing for circulation in each section. Another feature of the Hecla is the slightly funnel shaped form which is given to the vertical water tubes, and which permits every globule of steam, as fast as it is formed, to rise unimpeded so that there is a constant and uniform movement of steam upward from the heating surface to the steam chamber.

American Radiator Company, 92 Centre street, have just shipped two carloads of Perfection hot-water radiators for the United States Treasury Building at Washington.

The Herendeen Mfg. Company, Geneva, N. Y., are distributing as an advertising circular a *fac-simile* of a letter sent them by John Thorpe, chief of floriculture of the World's Columbian Exposition, in which he refers to the excellent results obtained by the four No. 8 Furman steam boilers which are in the greenhouse of the World's Fair, adjacent to the Horticultural Building.

At the Montreal, Canada, Industrial Exhibit, H. McLaren & Co. of Montreal had on exhibition a fine line of Safford radiators made by the Toronto Radiator Mfg. Company of Toronto. Radiators for every possible requirement were included in the display, which was very large and complete An artistic bestowal of coloring enlivened the design of the goods and con

tributed the effect of elegance to the massive impression given by the goods. Another display made by them was composed of bathtubs manufactured by the Steel Clad Bath & Metal Company. From a sanitary standpoint these baths present the advantage of having no wooden casing and a free circulation of air all about them is permitted. Their smooth polished surface added to their attractiveness and resting on massive claw feet of graceful shape and pretty colors they received a full share of the visitors' attention.

A VERY ACCURATE little pocket barometer is received from the Albany Steam Trap Company, Albany, N. Y., which foretells a change of weather and its probable character by the change in the color of six little spots on a white ground on a hard rubber disk. Of more interest to the steam fitter are the circulars which come with it showing the Blessing specialties manufactured by them. The Albany union is claimed to be extra heavy and with "no rubber joint to leak, no rust to stick." The special bucket return steam trap is said to automatically drain the water of condensation from all heating apparatus and return it to the boiler whether the coils are above or below the water level in the boiler. The reduced pressure system of steam heating using Blessing's combined automatic pump and governor to return the water of condensation back into the boiler under pressure is shown in another circular and is of interest to those who are heating buildings with steam from a power plant.

AT A RECENT CONFERENCE between the Boston Master Steam Fitters and Journeymen's Union the following agreement was reached: That master fitters employ only union men, and that the latter will only work for members of the association; that board will be paid for men working out of town, and that all overtime be paid as double time; that apprentices shall serve a term of two years; that there shall be one apprentice to every six journeymen and the establishment of a minimum rate of wages.

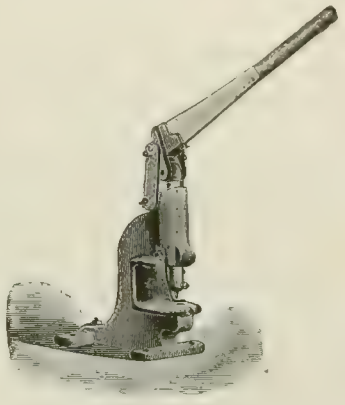
THE catalogue issued by the Toronto Radiator Mfg. Company, Limited, Toronto, Ontario, is a handsome volume, of oblong shape, measuring 10 x 7 inches. The front page is a collection of views of the works and branch warerooms of the company, showing six different buildings located in St. John, Winnipeg, Montreal, Quebec, Victoria and the main works at Toronto. There are also agents in Hamilton and Auckland, New Zealand. This illustrated catalogue, B, published for the season 1893–94, is devoted to Safford hot-water and steam radiators primarily, and also gives attention to other steam specialties and fittings. In a prefatory address to the trade they call attention to their excellent facilities for handling a large trade, and also refer to the merits of the Safford radiator, the simplicity of which is particularly commented upon. It is pointed out that with their patent right and left nipple system they are enabled to connect the loops of their hot-water radiator simultaneously at the top and bottom without the use of bolts, packing or lead. Following this preliminary portion are illustrations with descriptions of the several Safford radiators, beginning with the Favorite pattern. Among later goods are the Daisy pattern, the dining room radiator, Favorite pattern corner radiator, circular radiator and curved radiator. Then the direct-indirect and later notice is made of window radiators and stairway radiators. The Safford Perfect and Provincial complete the list of direct radiators. Indirect radiators are next mentioned, and attention is given to radiator valves and other fittings. Some 20 pages are devoted to half-tone engravings of large buildings in which the Safford goods are employed. Toward the end of the volume is a list of references. Following the list of references is a chapter entitled "Useful Information Pertaining to the System of Heating by Hot Water and Steam," compiled by John Taylor, secretary and general manager for the company. The information here is given in a compact form and will be serviceable to many people in the trade. Several tables in this connection will also prove of interest. Next to this chapter come specification forms, followed by plans of buildings heated by direct and indirect methods, among others being the Bank of Hong Kong and Shanghai, located at Tientsin, China.

C. W. WRIGHT, 96 Lake street, Chicago, general agent for T. C. Joy & Co.'s radiators, is distributing a circular calling attention to special features of this line. The new Crescent window radiator, for steam or hot water, is illustrated. This a low radiator, several rows of loops in depth, so as to secure great power and effectiveness within the smallest space. The Orient is another new radiator, for steam or hot water, 39 inches high, of a very richly ornamented pattern. A series of cuts is also given showing the cross section of the Orient, as compared with cross sections of loops by other makers of radiators. In printing the cuts red ink is used to show the unobstructed radiating surface and black ink the obstructed radiating surface. According to these cuts the Orient shows a remarkably small obstructed surface. It also contains hot-air flues between the loops for the purpose of increasing the circulation of hot air and thus adding to the heating power of the radiator.

A VALUABLE CATALOGUE is issued by the Nason Mfg. Company, 71 Beekman street, New York, under recent date. The outside appearance is attractive, being bound in dark bronzed cardboard, with the company's name and a radiator in tasteful scrolling embossed on the front cover, with a representation of the Equator heater on the back cover. The goods included cover a wide variety, among them being wrought and cast iron pipe, brass and iron valves and fittings, and general supplies for steam, gas, air, ammonia and oil, steam and gas fitters' and plumbers' tools and supplies, and steam and hot-water heating specialties. All the goods are illustrated, and very complete tables are given of prices, sizes and other essential particulars. Fittings of all sorts are noted, and there is a full assortment of specialties in the lines mentioned. At the close of the book more particular attention is given to the Equator and Gulf Stream boilers of their manufacture, with which the trade are familiar, and also to their radiators and other heating specialties. Pages 193 to 226 are particularly valuable to the steam and hot-water heating trade, as they contain much practical information on those systems of heating. The information presented is compiled by the Nason Mfg. Company from various well-known authorities. Altogether, the book is a very comprehensive publication, and will be appreciated by the trade.

Hand Lever Punch.

The accompanying illustration shows a new hand-lever punch that is being put on the market by R. M. Clough of Tolland, Conn. The principal features of this new punch are that it is bolted to the top of the bench and is operated by a lever which can be used either on top or in front. The lever is connected to a toggle and links, which, swinging over the center, makes a powerful punch. The links are so placed as to punch in



Hand Lever Punch.

direct line to the spindle or slide, this construction, it is pointed out, reducing the friction to a minimum.

Prize Competitions.

Prize Competition No. 27 (Reopened).

Local Associations of Merchants.

This competition closed July 8, but in view of the exceptionally few replies which have been received from the trade and the importance and practical nature of the subject, we have reopened it, and extend the time up to which responses will be accepted to September 16.

Some points in regard to the subject appeared in the announcement concerning the competition in our issue of August 24, and will probably be of service to those who are intending to compete.

The committee to whom the papers in Competition No. 25 were referred have awarded the prizes as follows:

First prize to J. E. JANSSEN.
Second prize to A. Q. CASSELBERRY.
Third prize to J. P. HUMES.

In a recent special trade edition, dealing with the most prominent industrial and commercial establishments of New Orleans, La., the *Times-Democrat* of that city makes extended and interesting mention of the Morris McGraw Company, Limited, of 45 and 47 Tchoupitoulas street, where the company have a large six-story structure. The business of the concern embraces wooden, willow, glass and tin ware, cordage, and general house-furnishing goods of all kinds, and their operations extend, it is said, over a wide territory, including Louisiana and the Southern States. They are agents for a number of Northern and Western manufacturers, and also manufacture some lines of goods themselves. Special mention is made of Morris McGraw, president, and John McGraw, treasurer and general manager, as progressive and able business men.

TIN PLATES.

Tin Tea Chests.

A new opening for the tin-plate trade is suggested by the *Iron and Coal Trades Review* of London, in the field of packing chests for tea. According to the report of the British Commissioners of Customs, just issued, the displacement of China tea by tea of East Indian growth is yearly becoming more pronounced, the use of the latter in the United Kingdom having risen in 1892 by 22,500,000 pounds, while that of Chinese and Japanese origin has fallen by 17,900,000 pounds. These facts, remarks our contemporary, will be read with interest by those tin-plate manufacturers who, in seeking new fields in which to place the sale of their productions, have conceived the possibility of supplanting the ungainly, lead-lined wooden chests now in use by stronger, lighter and more durable boxes made of tin plate. The tea boxes at present in use both in India and in Ceylon have to be imported from China, there being no timber free from taint, uniform in weight, and otherwise suitable for the purpose in the East Indies. The children of the Celestial Empire are fully aware of this; they know also that the development of the Indian trade can only proceed at the expense of their own, and they, therefore, make the planters pay heavily for the chests they require.

Recent Sheet and Tin-Plate Statistics.

The Bureau of Statistics has included in its last monthly report a series of statistics relating to imports of sheet iron and steel. No comment or explanation accompanies the tables. We print below the imports of iron and steel sheets for consumption:

Sheets of Iron or Steel, Common or Black, Including Iron or Steel Known as Common or Black Taggers' Iron or Steel, and Skelp Iron or Steel, Valued at 3 Cents Per Pound or Less. (Duty, 1.4 Cents Per Pound).

[Thinner than No. 25 wire gauge.]

Quarter ending	Pounds.
December 31, 1890	1,927,073
March 31, 1891	1,014,722
June 30 1891	1,228,158
September 30, 1891	1,470,536
December 31, 1891	2,709,314
March 31, 1892	2,377,279
June 30, 1892	1,944,436
September 30, 1892	1,820,048
December 31, 1892	2,284,328
March 31, 1893	2,451,830

Sheets of Iron or Steel, Common or Black, &c., Cold Rolled, Cold Hammered or Polished in any way, in Addition to the Ordinary Process of Hot Rolling or Hammering. (Duty, 1.65 Cents Per Pound.)

[Thinner than No. 25 wire gauge.]

September 30, 1891	282,124
December 31, 1891	729,001
March 31, 1892	2,504,365
June 30, 1892	3,242,230
September 30, 1892	7,542,762
December 31, 1892	14,130,037
March 31, 1893	15,126,276

Sheets and Plates Pickled or Cleaned by Acid, or by any Other Material or Process, and Cold Rolled, Smoothed, not Polished. (Duty, 1.65 Cents Per Pound.)

[Thinner than No. 25 wire gauge.]

December 31, 1890	520,014
March 31, 1891	340,312
June 31, 1891	590,011
September 30, 1891	504,479
December 31, 1891	245,240
March 31, 1892	1,153,343
June 30, 1892	1,183,533
September 30, 1892	866,002
December 31, 1892	1,636,523
March 31, 1893	1,564,066

The following is the official report of Ira Ayer, for the quarter ending March 31:

There are a number of mistakes in this table, which we print as it stands in the original document. The Cincinnati Corrugating Company are located at Piqua, Ohio, and not at Cincinnati.

Domestic Manufacture of Tin and Terne Plates.

Quarter ending	Tin plates.	Terne plates.	Total.	American black plate used.	Foreign black plate used.
1891.	Pounds net.	Pounds net.	Pounds net.	Pounds net.	Pounds net.
September 30	152,489	674,433	826,922	785,547	41,375
December 31	215,911	1,193,910	1,409,821	1,200,661	209,160
Six months	368,400	1,868,343	2,236,743	1,986,208	250,535
1892.					
March 31	1,099,656	2,109,569	3,209,225	2,132,082	1,077,143
June 30	3,071,534	5,129,217	8,200,751	5,178,263	3,022,488
Six months	4,171,190	7,238,786	11,409,976	7,310,345	4,099,631
Fiscal year	4,539,590	9,107,129	13,646,719	9,296,553	4,350,166
September 30.	3,611,367	7,341,358	10,952,725	5,920,082	5,032,643
December 31	6,138,739	13,617,752	19,756,491	8,043,449	11,713,042
Six months	9,750,106	20,959,110	30,709,216	13,963,531	16,745,685
1893.					
March 31	15,244,574	14 321,825	29 566,399	11,371,968	18,194,431

Under the recent ruling only the figures given in the fourth column would represent American product.

The following tables are printed without explanation:

Something is wrong with the line "Griffiths & Cadral," Griffiths & Cadwallader being at Pittsburgh. The Pittsburgh Tin Plate Company are at New Kensington, Pa.

Firms Reporting in the Two Periods.

Name.	Capital.	Estimated yearly production in report April, 1892.	Annual based on three and one-half times actual returns, quarter March 31, 1893.	Plates used.
	Dollars.	Pounds.	Pounds.	
American Tin Plate, Elwood, Ind	50,000	4,000,000	7,087,000	American.
American Iron and Tin Plate, Philadelphia	25,000	2,500,000	1,020,000	Principally foreign.
Apollo, Apollo, Pa.	50,000	4,000,000	700,000	American.
Blairsville, Pa	75,000	6,000,000	256,000	American.
Cincinnati Corrugated, Cincinnati	2,000	750,000	514,000	American.
Cleveland Tin Plate Company, Cleveland	15,000	3,500,000	829,000	Three-fourths American.
Columbia Tin Plate, Piqua.	4,000	1,500,000	700,000	One-sixth American.
Griffiths & Cadral, Niles, Ohio	2,000	750,000	736,000	Three-fifths American.
John Hamilton, Pittsburgh	4,000	1,500,000	1,675,000	Seven-eighths American.
Coates & Co., Baltimore	150,000	7,000,000	2,771,000	American.
Marshall Bros., Philadelphia	100,000	4,800,000	1,670,000	American.
Matthai, Ingram & Co., Baltimore	2,000	750,000	661,000	Foreign.
McKinley, Wilkinsburg	4,000	1,500,000	396,000	Three-fourths American.
Merchant & Co., Philadelphia	2,000	750,000	8,445,000	Foreign.
N. & G. Taylor	400,000	34,000,000	13,500,000	Foreign.
Norton Bros., Maywood, Ill	400,000	36,000,000	2,991,000	Foreign.
P. H. Laufman, Apollo, Pa.	50,000	3,000,000	665,000	American.
Pittsburgh Tin Plate, Newark, Pa	60,000	7,000,000	1,566,000	Foreign.
Record, Conneaut, Ohio	50,000	4,700,000	1,751,000	One-fourth American.
Scott, J. B., Pittsburgh	4,000	1,500,000	905,000	American.
Somerton, Brooklyn	250,000	14,000,000	1,435,000	American.
St. Louis Stamping Company	400,000	23,000,000	7,590,000	American.
United States Iron & Tin Plate Company	480,000	10,000,000	5,080,000	American.
Wallace Banfield, Ironda e.	120,000	10,000,000	4,860,000	American.
Total	$2,669,000	182,000,000	67,460,000	

Firms Reporting in April, 1892, but not Reporting in April, 1893.

Name.	Capital. Dollars.	Estimated yearly production. Pounds.
Anderson	20,000	4,000,000
Britton	1,200,000	10,000,000
Corning	60,000	5,000,000
Cumberland	50,000	4,000,000
Keystone	4,000	1,500,000
Lewiston	120,000	11,000,000
Newcastle	150,000	12,000,000
Total	1,524,000	47,500,000

New Firms Reporting in March, 1893.

Name.	Annual production.* Pounds.	Plate used.
Thompson	1,883,000	Foreign.
American Stamp.	5,845,000	Foreign.
Baltimore	4,186,000	Foreign.
Gummey	1,652,000	Foreign.
Morewood	10,881,000	Foreign.
Norristown	5,674,000	Foreign.
Philips	1,106,000	Foreign.
Saunders	1,834,000	Foreign.
Total	*33,061,000	

*Estimated at three and one-half times last quarter's production.

The first table evidently represents the expectations of producers early in 1892 and the realization thereof a year later. It is quite clear that an estimate based upon three and a half times the product of the last quarterly return is eminently safe from the standpoint of the compiler, but the fact is ignored that some of the mills only began work during the period which forms the basis of the compilation, and that the latter is, therefore, very inadequate and looks unfair.

SCRAP.

THE DEADWOOD, S. D., *Times* says in a recent issue: It is definitely ascertained that the discovery made by Noah Siever some weeks ago on Bare Butte Creek, near Galena, carries tin in sufficient quantities to warrant further development work. An open cut has been made on the side hill 15 feet in length and a 12-foot face, showing the vein to be in place and 3 feet wide, the apex of the vein being 9 feet below the surface. The ledge has been traced westerly to Ruby Gulch, about a mile distant.

DURING the week ending September 9 all of the works owned by the Falcon Iron & Nail Company, Niles, Ohio, were in operation. They comprise seven light sheet mills, two tin mills and one skelp mill, together with sufficient puddling, scrapping and bar rolling capacity to furnish material for the mills mentioned. The galvanizing shop, containing two pots, was also in operation. Fully 750 men were employed. There is no certainty in regard to a continuance.

THE CUMBERLAND STEEL & TIN PLATE COMPANY, Cumberland, Md., are now running their mill to its full capacity after a shut down of ten days for necessary repairs.

MERCHANT & Co., Philadelphia, are offering to the trade American continuous roofing plates manufactured by the American Tin Plate Machine & Mfg. Company according to the Buckman process, which was described in *The Metal Worker* some time ago. The chief feature of the process is the production of a continuous sheet of terne plate, the machine cleaning, coating and joining the sheets automatically. This roofing plate is made and sold in rolls 60 feet long and 20 inches wide, containing 100 square feet. The rolls when ready for shipment are in convenient shape, being in the form of a cylinder about 10 inches in diameter and 20 inches long. An inspection of the sheet shows that the coating has been evenly distributed, and is without break or spot. Apparently a good deal of tin is used in the mixture, giving a bright look to the plate, and the coating is of even thickness down to the extreme edge. The convenience of having the tin furnished in a long strip will be appreciated by the roofing trade. It should be further observed that the sides of the strip are absolutely straight and parallel, which is sometimes a difficult result to accomplish in joining ordinary sheets in the shop if they do not happen to be accurately squared. If the rolls were crated or incased in some way so as to protect the outer layer from scratches and other marring during transit, the improved appearance would be worth the outlay.

BRITISH TRADE returns for August show a material falling off in the exports of tin plates to the United States during that month. The quantity was 15,000 tons, againt 24,000 tons sent over in August, 1892.

BY LATEST ACCOUNTS no less than 29 Welsh tin-plate works were shut down, ostensibly on account of the coal strike. It is reported, however, that in most cases the real reason was a dearth of orders and current market prices being lower than the cost of manufacture.

HEATING AND PLUMBING.

NEW WORK AND CONTRACTS.

A NEW heating apparatus of the most approved modern character will soon be installed in the Washington House at Williamstown, N. J, so says the landlord.

CONTRACT amounting to $1800 has been awarded to the Holyoke Steam & Gas Pipe Company of Holyoke, Mass., for installing the boiler and steam heating plant, including a new chimney, in a school building at Windsor Locks, Conn., under the supervision of J. M. Allen of Hartford, who made the plans.

A NEW heating and ventilating plant has been installed by the Exeter Machine Works of Exeter, N. H., in the Dunbar Street School at Abingdon, Mass.

THE Board of Supervisors of Milwaukee County, Wis., have been notified by Superintendent Fred. Wetenkamp of the urgent necessity of repairing the boiler and steam heating apparatus in the almshouse.

EDWARD FLINN is superintending the plumbing work in the town hall at Fairhaven, Mass., and keeps six men busy. There are twelve water closets, sixteen washbowls, three soapstone sinks and one copper bath for the janitor's family. Hot and cold water will be furnished to all of the bowls, which are set with marble slabs, supported by nickel-plated legs. All the water closets, washbowls, brass pipes for hot water, soapstone sinks and main supplies are in and the large water tanks are lined with copper. A water back will complete the kitchen, and about three weeks' more work by the plumbers will complete the job.

THE CARMAN THOMPSON COMPANY, Lewiston, Maine, have filled a $1000 contract by putting a new steam heating plant in the school building at Canton.

THE trustees of the Levings Methodist Church, at South Troy, N. Y, have decided to put a new heater in the parsonage.

CITY ARCHITECT WHEELRIGHT of Boston awarded the contract for plumbing the new hospital for contagious diseases to Henry Hussey & Co. for $10,000.

T. J. KINNEY put in the plumbing fixtures at the Dunbar School at Abingdon, Mass., and the closets are said to be models of neatness.

THE THEO. JACOBS COMPANY, 72 and 74 Market street, Chicago, are to furnish two 48-inch by 14 feet horizontal tubular boilers, feed pumps, surge tank, hot-water heating tank, and all the paraphernalia connected with a first-class heating plant, for the Carolina Hotel, Rush and Indiana streets. American radiators will be used for the 8000 feet of radiation required.

THE FARQUHAR HEATING COMPANY of 58 Dearborn street, Chicago, and 217 West Locust street, Des Moines, Iowa, have, among others, the following contracts for heating: Hubbard, Iowa, combination of hot water and warm air in school house; Mason City, Iowa, combination of hot water and warm air in residences of Geo. E. Winter and Wm. Hoy; Sigourney, Iowa, circulating tube water heater for store building of C. B. Dobie; Forest City, Iowa, combination of hot water and warm air in residence of E. Secor; Mason City, Iowa, two low-down surface burners for Christian Church; Polk City, Iowa, two large Panama warm-air heaters in school house; Groundy Center, Iowa, circulating tube water heater in residence of A. F. Willoughby; Blue Island, Ill., circulating tube water heater in residence of A. N. Townsend; eight Panama warm-air heaters in row of flat buildings of O. W. Burke; Harvey, Ill., circulating tube water heater in residence of C. A. Carr; Chicago, circulating tube water heater in residence of W. F. Blocks, 1628 Indiana avenue.

JAMES B. CLOW & SON, manufacturers and dealers in supplies for plumbers, railroads and water works, Lake and Franklin streets, Chicago, are to furnish 600 tons of iron pipe, 112 Eddy hydrants and 56 Eddy valves for the water works at Harlem, Ill.

THE J. L MOTT IRON WORKS, 311 and 313 Wabash avenue, Chicago, have lately received orders for Sunray heaters from San Francisco, Cal.; Decatur, Ill.; Clinton, Iowa, and Fort Gratiot, Mich.

COE & MCMILLAN of Monticello, Ill., have lately installed a steam plant in the Talono High School, consisting of a No. 10 Haxtun boiler, with 872 square feet of direct and 516 square feet of indirect radiation. They have also just finished the plumbing in the two flats in Monticello for J. D. Knott, and have the contract for the plumbing in a residence for David White.

AT FAIRFIELD, MAINE, the Odd Fellows are considering the heating of their building with steam and hot water, and the advisability of furnishing heat for adjoining buildings.

HENRY WILLARD has been awarded the contract of putting the heating apparatus in the new house of V. N. Ryan, at Milford, Mass.

MALVEN, GORDON & Co. have the contract for putting a new steam heating apparatus in the German Lutheran Church at Port Jervis, N. Y.

THE RETAIL STORE.

The Wayne Combination Washer.

The washer illustrated in Fig. 1 is made by the Anthony Wayne Mfg.

Fig. 1.—The Wayne Combination Washer.

Company, Fort Wayne, Ind. The machine is referred to as being simple in construction and as having no parts which will get out of order. It is stated that the gear is strong, that the sud box is made of well-selected yellow poplar, well bolted together, and that the bottom consists of a heavy sheet of galvanized iron put on with a packing that makes it absolutely water proof. The standards are of hard wood, all painted and varnished. The machine combines the reciprocal pinwheel motion with an oscillating movement of the whole box. The main advantage, it is claimed, is that the machine works easily, because the water, when the machine is oscillated, is made a factor to help do the work; for as the machine is tilted either to one side or the other, the weight of the water does a large amount of the work. It is explained that the machine has a large capacity, and on account of its oscillating movement it requires a small amount of water, and that it will wash quickly, a continued motion of five minutes doing a large amount of work, as the washer has the double motion of the pinwheel and of the rush of the water through the clothes. When the machine is open and the lid thrown back, as in Fig. 2, the transverse rod to which the rack bar is attached drops into an opening in the side, thereby locking the machine, so that a wringer can be attached on the opposite end without fear of tilting the machine. The hinges are described as being of a unique design of malleable iron, made especially for this machine, and as entirely out of the way, being intended both as hinges and also to strengthen the locking device. The weight of the machine is given as 40 pounds, the point being made that it can be easily handled, besides saving a large amount in freight charges.

Fig. 2.—The Washer Open.

The Economic Steam Cooker.

Illustrations are herewith given in Figs. 1 and 2 of the new Economic steam cooker, manufactured by Rau Mfg. Company, 128 Michigan street, Chicago. The cuts show both the exterior and interior of this utensil. It will be observed that the three compartments for cooking are so arranged as to be entirely surrounded by the hot steam arising from the bottom vessel containing the boiling water. The outer compartment protects all the inner vessels from coming in contact in any degree with cold air. The manufacturers state that this is a very important improvement in their form of cooker, as it utilizes all the steam produced and thus cooks quickly, requiring not only less time, but economizing fuel and delivering the cooked food in better shape. No odor escapes from one compartment into another. It is made in two sizes, and either in tin or full nickel.

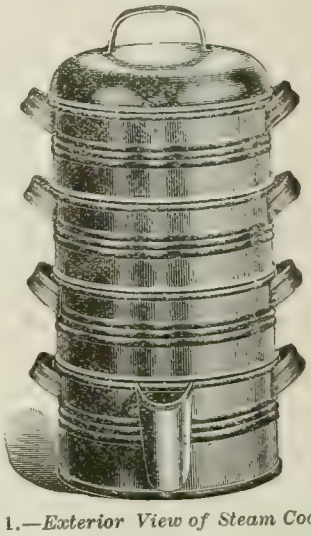


Fig. 1.—Exterior View of Steam Cooker.

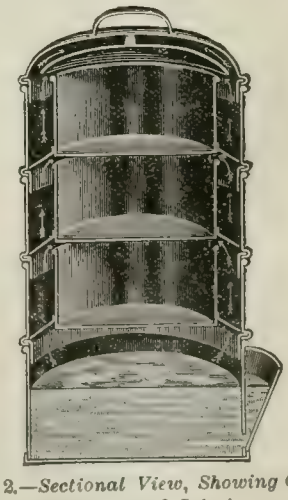


Fig. 2.—Sectional View, Showing Compartments and Interior.

STOVE TRADE NOTES.

The Future of the Hot-Air Furnace.

By A. W. Glessner,

President of the Excelsior Steel Furnace Company.

HEATING GUARANTEES.

One feature of the furnace business that has caused great trouble and loss to the dealer is the nature of the heating guarantee insisted upon by the architect for his client, or by the owner himself. A contract is frequently taken by a dealer to install a furnace job, and the job is finished in accordance with the plans and specifications, and is accepted by the superintendent of the architect, and the dealer calls for his certificate, that he may make a settlement with the owner.

The architect says: "Give me a written guarantee to heat the building to 75° in all kinds of weather, or remove the furnace and refund two-thirds of the contract price, and I will issue the certificate." When told that the contract contained no provision for so sweeping a guarantee, or, in fact, for any guarantee at all, the architect says that other contractors agreed to give such a guarantee, and unless the dealer does so he will have to wait until the furnace is tested before he gets his pay. After much vigorous protesting the dealer gives the required guarantee, as he cannot afford to be without the money for so long a time, and departs a sadder if not a wiser man.

From that time forward he is tied hand and foot to the owner of the furnace, and no matter how poorly constructed the house, no matter how defective the furnace flue, the dealer must manage to heat the building in accordance with the terms of the guarantee, or suffer the penalty, which would mean a serious financial loss. Many a dealer has been caught in such a predicament and become soured for all time on the furnace business. No man knows, or can know, in advance of construction, the nature or character of a building, and in giving a guarantee must reserve to himself certain exceptions and rights; otherwise he must obtain an exorbitant price in order to insure him for the risk he runs.

I have figured on plans and specifications which were so drawn that if the contractor was obliged to follow them to the letter he might as well make a present of the job to the owner after the work was completed as to give a guarantee on it. A furnace contractor always should give value received on every job, but he knows or should know the limitations under which he must do his work, and that certain forces must be controlled if his work is to produce the best possible results. If the basement is low, and the pipes long, and traversing exposed portions of the basement in order to reach registers located in the wings of an L shaped structure, he must know that he is working against heavy odds, and to guarantee such pipes to heat in "all kinds of weather" would be the greatest possible folly.

In nine cases out of ten the houses to be heated by furnaces can be heated in a manner satisfactory to the owner, but the tenth house may contain obstacles which cannot be overcome, and therefore it behooves the dealer to give guarantees only after a careful study of the conditions under which the furnace must work.

In giving a guarantee of any kind the furnace contractor should have *carte blanche* in the matter of location of all stacks, pipes, registers, cold-air duct and furnace. It would be unjust to ask a man to run a race and then tie his hands and feet; and if furnace contractors are willing to take contracts for heating houses under a guarantee, and then relinquish to others the location of the registers, pipes and heating apparatus, they deserve to get their fingers burnt, and burnt badly.

I know of a case where a furnace contractor guaranteed the amount of fuel his furnace would burn during a certain period and had the pleasure of writing a check for the excess amount of fuel consumed. I know of another case where a contractor guaranteed to heat a hall, the basement of which was sided up with unmatched boards through which the cold penetrated to such an extent that the pipes were chilled and could not deliver heated air in any volume to the auditorium above.

Many dealers will recall painful experiences similar to the above and have learned the lesson of exercising great care in giving guarantees on work. The guarantee is a club in the hands of a dishonest owner, and in many cases it has been used unjustly to both the dealer and the furnace business, and when a guarantee is given it should be so worded as to protect both owner and contractor.

(To be continued.)

Reading Stove Works,

Orr, Painter & Co., proprietors, Reading, Pa., issue a very full and interesting catalogue of stoves and ranges of their manufacture, the publication being for the years 1893 94. The volume is notable on account of its thickness, there being nearly 250 pages in it. The binding of cardboard is tasteful, and the paper is of a fine grade, which renders the typographical appearance very pleasing. In an accompanying circular letter which they address to the trade they direct attention to their several special lines, and more particularly call attention to their Torrid and Torrid Sunshine furnaces, the advantages of which they elaborate. In the prefatory announcement they refer to their excellent facilities for shipping goods, and also make mention of their different branch offices, stating that they have established a branch warehouse in Boston for the accommodation of their growing trade in New England. After the usual preliminary notices concerning terms, &c., the catalogue proper begins with the line of Sunshine ranges, to which over ten pages is devoted. Next follows the Othello, the New Mayflower, other types of the Sunshine range; after which attention is given to cook stoves, the Grand Sunshine, the New Lighthouse, the New Excelsior, Penn, Harmony, Cora and various similar constructions. The Welcome Sunshine is a plain and tastefully decorated coal cook, made both with and without reservoir. At page 110 begin notices of parlor stoves, the Golden Sunshine, Sunshine Square, Merry Sunshine, Parlor Sunshine, Western Sunshine and Bright Sunshine, embracing a variety of very handsome constructions of this sort. A number of round surface and base burners follow, from which the dealer has a wide variety of choice. Wood stoves and Franklins are given suitable attention; also cannon stoves and fire places. Under furnaces, several views are presented of the Torrid Sunshine, and the construction and special features are carefully explained. The Torrid Sunshine combination heater is also noted at some length. The closing pages of the book are of more than ordinary interest for, in addition to hollow ware and miscellaneous goods noted, besides indexes, &c., there is some interesting reading about the operation of stoves, the defects of chimney drafts, &c., while further still is a chapter under the general title of "Selected Information," giving tables and some other matter that will be of not a little service to the dealer.

St. Louis Stove Trade.

The era of depression, so far as the St. Louis stove trade is concerned, seems to have disappeared entirely, and the four local foundries, namely, the Excelsior Mfg. Company, Buck's Stove & Range Company, Western Stove Mfg. Company and Bridge & Beach Mfg. Company, are all enjoying an excellent trade. A visit to these foundries finds their stock in excellent shape and at this writing they are able to fill all orders promptly. During the past week, however, orders have been coming in very fast. Orders received by these four foundries on Monday, 11th inst, will aggregate close to 2000 stoves. It would seem that just now is a propitious time to send in orders, as should the present heavy demand continue, and indications are that it will, the end of September will find the local manufacturers bare of stock. It will be impossible for the traveling representatives of these concerns to see all their trade during the next two or three weeks, and the only way out of the difficulty is for the dealer to send in his order by mail.

The Fuller & Warren Company, Troy, N. Y., through Walter P. Warren, president, issue a notice to their customers, in which they mention that in consequence of the past financial disturbance which may disturb early fall trade and make customers hesitate to place large orders for immediate shipment, they shall endeavor to keep constantly in stock and ready for immediate shipment on receipt of orders a large and assorted supply of their wares. They refer to their large corps of trav-

eling salesmen, but urge that as it is impossible to call on all their customers as frequently as they should desire they request to be favored with orders direct without waiting for the traveling salesmen.

John Van.

The engraved likeness of John Van of the John Van Range Company, which we give herewith, shows the face of one whom the trade long knew and honored. Last week we printed a notice of his death and the more important incidents of his life. He died at the age of 81 years, having lived in Cincinnati half a century. He was born and passed his boyhood in Montreal, but at the age of 20 years he was driven out with a price on his head for participating in the French Revolution. In the business world he is chiefly known for his introduction of the wrought-iron range, which has done so much to revolutionize the modern kitchen apparatus. Mr. Van was twice married, but survived both of his wives. He leaves six children, five sons and one daughter.

H. Rendtorff & Co.

6 Lake street, Chicago, have just issued a supplementary catalogue and price-list of stoves and ranges, consisting of 16 pages in a neat paper cover. The Ideal wrought-steel range is first illustrated. This is characterized as "a medium-price, first-class range which is built upon honor" The door panels, corners and name plate are nickel plated. Flues are asbestos lined throughout. The oven is thoroughly braced and bolted. It is made in six styles and five sizes, for hard coal, soft coal, coke or wood. The Crown Andes base burner, improved for 1893–4, comes next. This stove is designed in the latest style, has a large swell front, high dome, artistic carved nickel sections and extra large solid fire pot, which is easily removed without taking stove apart, and draw center grate or duplex grate with annular shaking ring. Every stove can be used as a single or double heater. Each is made with hot-air ventilating flues, in order to connect by a pipe with room above, thereby utilizing all the heat. Two sizes are made. The Pearl Andes is a new parlor heater, square style, with large mica section, nickel dome, hot-air circulation, double heating attachment if desired, duplex or draw-center grate, and is made in two sizes. The Ideal Oak, A series, has a one piece ash pit and screw-register draft, making the ash-pit section perfectly air tight. The ash pan is very large. It is intended for any kind of fuel and is made in five sizes. The Ideal Oak, B series, has been redressed for this year and is also made in five sizes. A new Todd stove is offered named the Ideal Todd, which is handsomely ornamented, has an automatic damper, reversible pipe collar, automatic inside upper door, patent removable linings and high collar and is made in two sizes. The Ideal oil heater is a finely finished oil stove, with central draft burner, full hot-air flues, mounted on casters, and is furnished either full plated or half plated. The firm also call attention to their line of zinc and crystallized stove boards made in their own factory.

Chicago & Erie Stove Company, Limited.

Erie, Pa., favor us with a catalogue of their goods that contains much to interest those who are concerned in the use and sale of ranges, stoves and furnaces. The present volume includes several specialties that have been added to their line, and also an increased assortment. The first article noted in the catalogue is the Superb Helper, a wrought steel range, the special features of which are patent double acting balanced oven doors, double kicker, asbestos lining, &c. Alluding to the construction of these ranges, they state that there are, by actual count, 957 different parts and pieces in the smallest size made with reservoir, all of which are carefully arranged and fitted by hand. The construction and merits of the many different sizes and styles of the Superb steel ranges are considered at some length, attention likewise being given to their double hotel ranges. The next line taken up is the Patent Quick Helper ranges. These are described as successfully combining many advantages offered by both steel and cast iron ranges. Coming to the regular cast-iron goods, there is offered the Duplex Invincible range, made in various sizes and styles; then the Capital Helper, Perfect Helper, Albert Helper, the Renowned, Fairmount and others follow. Various wood ranges are shown; then attention is given to heating stoves, beginning with the Art Invincible, Brilliant Helper, Duplex Helper, Invincible Helper, Royal Helper and Art Helper. Following these are various cheaper grades of stoves of the plainer sort, cannon stoves, &c., while at the close are illustrated and described the Advance portable furnace and the Chief air heater. The Chicago & Erie Stove Company, Limited, also issue this catalogue from their Chicago house, which is at 171-173 Lake street, that city.

JOHN VAN.

Some New York State Stove Dealers.

The following notes refer to some representative stove dealers at Montgomery and Walden, Orange County, N. Y.

At Montgomery will be found A. N. Wade, who is the successor to D. M. Wade, his brother. His stock includes several varieties, among which may be mentioned the Howe Ventilator, the Radiant Manhattan and others of Eugene Munsell & Co.'s line of goods. The West Shore range is also a leader with him. D. M. Wade, who yet remains about the store, tells many an entertaining story of the good old times when he used to run a tin cart for miles around. There were but few tin shops in that section 41 years ago when he began business. Stoves were also few. There hangs above his desk to-day a large cut in a frame of the old Sheer & Packard cook stove. That stove and one made by the Orange County Furnace at Middletown, and which was called the Orange County Air Tight constituted their line. The parlor heating stoves were yet unheard of.

Brown Brothers are also in business at Montgomery, handling almost exclusively Perry & Co.'s line of Argand stoves and ranges. Burdette, Smith & Co.'s steel ranges occupy a prominent place on their floor. They do a large business among the milk factories nearby in the way of repairing and manufacturing milk cans.

Four miles distant from Montgomery is Walden, a very enterprising town, whose chief industry is the manufacture of cutlery. There also are two very enterprising stove dealers, one of whom, A. K. Wade, is a brother of A. N. Wade of Montgomery. His line of stoves consists of the Howe Ventilator and Perry & Co.'s ranges and stoves. Mr. Wade is known as a hustler in the stove and furnace business and also takes many large roofing contracts. He has recently moved into his new store, just opposite, which he purchased. Probably no dealer in this section has more friends among the traveling men than Mr. Wade. He uses them all well, gives them a hearing, talks considerably about the tariff on tin plates and the condition of the country, and then often gives the traveler an order so that he will not go away skunked, a great remark with him.

Schoonmaker & Williams have a fine store down near the post office. The Andes and Acorn are the leading lines of stoves which occupy their floor. They make a special drive on Acorn ranges. On one side of their store is as complete a stock of Andes goods as can be found anywhere in that section of the

State. Seeds and agricultural implements are also among their extensive line.

The Indianapolis Stove Company,

Indianapolis, Ind., issue a catalogue of the heating goods of their manufacture which will be received with interest. The volume, of convenient size, measures 6 x 8 inches, and is bound in tinted paper. Following an alphabetical index and an announcement to the trade respecting terms and prices, the catalogue proper opens with the Atlantic cook stove for coal or wood, having a four-hole top and with and without bracket reservoir; the Crown, made in three styles; next the Atlas, in a similar number. The Clifton is a stove with four holes and bracket reservoir, the special features being nickel knobs and name plate, pouch feed, shaking and dumping grate and other attachments. The Tremont ranges come next, then the Windsor, in four styles; Charm, Kitchen Queen, the Improved Indianola, Dexter and the Monon. Nearly 29 pages are given up to ranges and cook stoves, after which the catalogue continues with a line of heating stoves made by this firm. We enumerate the names of the goods referred to, which are arranged in the following order: Burr Oak, with and without extension top; Black Oak, with extension top; Columbia Oak, Silva Oak, the Indiana Franklin, Nation cannon, Star cannon, Mars, Express, Carbon, followed by parlor stoves for coal, wood or gas, of which several styles are made. The Avon is a medium price square heater, made for both coal and for wood. A variety of box stoves are noted toward the end. The final pages of the catalogue are devoted to hollow ware and sundries.

ODD PLATES.

ROBERT ROBINSON & SONS 105 Lake street, Chicago, issue an illustrated circular describing the Splendid and Novelty oil heaters, which they are now offering to the trade. The Splendid is made in two sizes. The No. 10 is a small stove, for heating small rooms and offices, and its shipping weight is but 25 pounds. The No. 15 is a large stove, mounted on a roller base, which contains a portable tray, has a tank holding a gallon and its shipping weight is 60 pounds. The Novelty is a new departure in oil heaters. It is similar in appearance to the cheerful open Franklin stove, having a swell front, nickel dome, nickel foot rail, nickel legs, nickel name plate, nickel hood plate, brass mantel rail and plain castings, blacked instead of japanned. The tank holds 6 quarts, and the tank and burner can be taken out through the lower door. It is mounted on three feet, on a roller base with portable tray, and its shipping weight is 70 pounds.

THE MICHIGAN STOVE COMPANY'S wall match box, which they are distributing this season, is handsome enough to be a World's Fair souvenir.

THE STOVE FOUNDRY of Baldwin & Graham, at New Castle, Pa., has started up after an idleness of several weeks. About 200 hands are employed.

REEVES & HORNER of 45 North Second street, Philadelphia, stove dealers, are making a specialty of stove repairs, and their efforts in this direction have proved so successful that they have followed it to an unusual extent. The practice of storing the different pieces of stove repairs in heaps or bins, without regard to order or arrangement, makes it difficult to keep track of stock and causes much confusion in the filling of orders. The firm of Reeves & Horner have adopted a system of their own, which enables them instantly to produce the smallest part of any stove made in Pennsylvania, New Jersey, Delaware, Maryland and Virginia at the present time. Their system has necessitated the use of upward of 8000 separate bins. In connection with this system of keeping stock a register or journal is kept in which are recorded the names of all stoves and furnaces at present known to the trade, and many which have dropped out of the recollection of even their makers. The record is so perfect that every change and addition which has been made in the lines of the different manufacturers has been noted; and the firm claim to be able to supply parts for stoves made over 50 years ago. This register has entailed a vast amount of labor on the part of Mr. Reeves, who has had many years of experience in this line. An idea of the extent of the record may be gained from the fact that it provides for over 64,000 changes of patterns of stoves and heaters, with every piece of repair usually carried in stock.

THE BUSY WHEELS of the stove plant of D. G. Littlefield & Co. of Albany, N. Y., makers of the West Shore range, continue to revolve, and the management report comfortable sales of this popular range.

THE PERRY STOVE COMPANY, Albany, N. Y., are running their large plant, on the island below the city, full, and anticipate a silver lining to the cloudy market in the shape of a good fall trade. They have on hand, to tempt the dealer, a most artistic as well as serviceable line of Argand heating and cooking goods. The World's Argand and the other line of parlors are still favorites, while there is a long list of heaters of various shapes and sizes from which to select.

THE ONLY STOVE MANUFACTURERS who exhibited at the New York and New England fair, recently held in Troy, N. Y., were the Phillips & Clark Stove Company of Geneva, N. Y., and Troy, and the Andes goods were tastefully displayed in a tent and attracted a great deal of attention.

THE HULBERT OIL GAS HEATER COMPANY of St. Louis, Mo., have been chartered, with a capital stock of $10,000, to manufacture gas burners, heaters, &c.

THE WEIR STOVE COMPANY, Waltham, Mass., have shut down temporarily.

THE CHATTANOOGA STOVE COMPANY, Chattanooga, Tenn., are working their plant at its full capacity, and find their shipments compare favorably with those of previous seasons.

THE STOVE WORKS of Lowerman Bros, at Bridgeport, Ala., have started on fall orders, and the firm say that their outlook for a busy season is promising.

GEO. R. PROWSE, 224 St. James street, Montreal, Canada, has at the Industrial Exhibition being held in that city a considerable display of coffee urns, hotel ranges, broilers, plate warmers, carving tables, open heating stoves, refrigerators and water filters.

CHARLES E. COLEMAN, representing Eugene Munsell & Co., New York, has just returned from a season's trip and reports sales in advance of last year, partly due to the fact that he began traveling the latter part of May. Mr. Coleman will now be at the company's office, 218 Water street, New York, until January and will be pleased to meet there his many friends in the trade.

WE ARE INDEBTED to A. Weiskittel & Son, Baltimore, Md., for a batch of blotters carrying an advertisement of the Fire King gas heaters and cookers. The goods include stoves, ranges, water heaters, heating stoves, ovens, &c., and the trade are invited to send for a new catalogue and examine the merits of the goods. Many new patterns of gas heating stoves have just been brought out.

WE HAVE RECEIVED from Dr. Edward Kirk, 1208 Vine street, Philadelphia, a circular relating to his chemical compound, which he recommends for "purifying, softening and reducing wastage in cast iron when melted in a cupola, and fluxing the cupola." He refers to the flux known as Kirk's chemical compound flux, which was used many years ago, and which he discontinued making in 1883, as he found defects existing in its working. Since that time he has been engaged in overcoming the defects, and, according to this circular, has succeeded to so great an extent that he now offers a chemical compound which removes from cast iron the impurities producing a deleterious effect. Along with the circular of the compound is a two-page pamphlet on the cupola furnace that will be of interest to foundrymen.

A SPECIAL CIRCULAR issued by the Chicago & Erie Stove Company relates to the patent Model Helper four-hole steel range with 8 or 9 inch pot holes and oven 18 x 20 inches. An illustration is presented of the apparatus and a general description given. On the back of the circular is a reference to the cast-iron adjustable braces and other features of their ovens.

THE STOVE MANUFACTURERS were represented at the Convention of Boards of Trade and Commercial Organizations, which met in Washington September 12, to urge upon the Senate of the United States the repeal of the Sherman Silver Purchasing act, by D. A. Dangler of Cleveland and J. A. Lansing of Scranton, both of whom were appointed upon a committee to wait upon Senator Voorhees, chairman of the Finance Committee.

THE MILWAUKEE GAS STOVE COMPANY, 15 and 17 Erie street, Milwaukee, Wis., have brought out a small but very pretty catalogue describing their latest productions. Attention is first given to their line of Perfection gas grates. These are designed for mantel settings and are made in two sizes, finished in ebony, antique copper or antique silver, guaranteed to burn all kinds of gas. They are made with an asbestos back for directly radiating heat, but additional heating power is afforded by the circulation of air between the heated surfaces. The chimney connection is a positive flue easily controlled by a damper. The burner and valve are the result of long and very thorough experiments in which all difficulties have been overcome. The design of these grates is artistic in the highest degree. Round gas heaters with asbestos fronts are next shown in three sizes. Then follow round gas heaters with polished copper reflector

fronts, also in three sizes. A square reflector heater and a square asbestos heater are made in one size each, in ebony, nickel or antique copper finish. An illustration is given of the Perfection burner and needle valve as used in the company's gas ranges, and one of the ranges is shown with boiler attached ready for operation. A. R. Sille, 128 Michigan avenue, Chicago, is general agent for these goods.

CHARLES NOBLE & Co. of Philadelphia are in the market this year with a line of goods very little changed since last season. Their Pilot caboose stove now has four round holes instead of two round and two square holes, as formerly; and other stoves have been somewhat improved in their dressings. They are prepared to meet an unusually large demand for their Iron King cook stove, which is said to be exceedingly popular in the South as well as in the North. Their stock of Liberty, Melrose, Sam, Extra, Busy Bee, Wide Awake, National, Sterling and Index ranges, Noble Cook, Elmo, Cotton King, Liberty Cook, Star Queen, Lily, Palmetto, New Dexter and Nine Plate cook stoves, Housekeeper elevated oven kitchen ranges, Beauty brick set ranges, Peerless and Dauntless parlor cooks, Liberty Square and Delta parlors, and Liberty and Liberty Junior sheet-iron heaters is large, as also is their series of self-feeders. The only new stove which they are introducing this season is the Ruth, a handsome cook stove designed to meet the demand for a low-priced article. It has four holes, nickel plate on oven door, is suitable for wood or coal, has 15-inch oven and a fire chamber 18½ inches long.

J. B. STANBROUGH of Owego, N. Y., has a fine display of Stewart ranges and Splendid parlor stoves, made by the Fuller & Warren Company, at the Tioga County Fair. He is now working off the second carload of these goods bought this year, and his experience at fairs heretofore has been that he has sold everything that he had on exhibition.

THE BELLAIRE STOVE COMPANY of Bellaire, Ohio, had a most attractive exhibit at the West Virginia State Fair. It was in charge of Secretary E. H. Rider, and consisted of cooking and heating stoves. The Brilliant Star and Morning Star ranges, the Peerless Star and Morning Star cooks, and the Star Franklin and Model Star parlor heaters were the features of the display.

Squab roasted in plain sight while you wait, irons heated in 3 seconds without fire and water boiled in less time than it takes to tell it without stove or coals are a few of the novel sights at an electrical display in the basement, says the St. Louis *Globe-Democrat*, in describing the wonders of the Electrical Building at the World's Fair. This is one of the favorite resorts of enterprising housekeepers. The electricity does the work with such marvelous speed and without the drawbacks of heat and smoke, that it seems the ideal agent. Many of the visitors seem to be afraid of shocks, but are assured that none are possible.

An exhibition of mining and metallurgical appliances is to be held at Santiago, in Chili, next year, opening March 15. Any information in regard to it can be obtained from Señor Julio Perez Canto, secretary of the Sociedad de Fomento Fabril, Santiago.

Trade Notes.

W. H. BUCKIUS, Canton, Ohio, issues a neat price-list of Tinware which he manufactures and sells, the divisions of the catalogue being as follows: Deep Stamped Ware, Shallow Stamped Ware, Sieves, Spoons, Tinners' Trimmings, Japanned Ware, Pieced Tinware, Granite, Agate, Blue, White and Gray Enameled Ware, Erie Hollow Ware and Miscellaneous Goods. The 64 pages of the catalogue are profusely illustrated and tables of sizes and prices accompany the goods.

THE ADAMS & WESTLAKE COMPANY, 110 Ontario street, Chicago, Ill., are distributing, as a souvenir of their exhibit at the World's Fair, an engraving of a gold-plated Empire brass bedstead. The bedstead is an exquisite piece of work and the reproduction in the engraving is faithfully done.

THE SHEET MILL of Summers Bros. & Co., Struthers, Ohio, has been in operation for several weeks.

THE KEWANEE BOILER COMPANY, Kewanee, Ill., and 96 Lake street, Chicago, are building a battery of 60 inch by 16 feet boilers for the General Electric Company of Peoria, Ill. The same company have just completed 12 boilers, 60 inch by 18 feet, with stacks and breeching, for the Consumer's Oil Company of Waco and Houston, Texas, and Little Rock, Ark.

THE CHATTANOOGA FOUNDRY & PIPE WORKS, at Bridgeport, Ala., are running with 80 hands on orders that will last a year.

THE NIAGARA STAMPING & TOOL COMPANY, Buffalo, N. Y., issue a circular of testimonials respecting the tools and machines of their manufacture for sheet-metal workers. The circular has an attractive appearance due to the interlining with red ink. The letters are from many prominent users, including many stove makers and other well-known firms. They relate to the tools of the company, and all express the highest satisfaction with them. The testimonial letters are signed and dated in all cases.

A NOTICE APPEARS in this issue of an auction sale of 10,000 cases of Gray Enameled Opal Ware and Blue and White Ware, at 12 Murray street, New York, by the Lalance & Grosjean Mfg. Company through E. Bissell, Son & Co. This is, we are advised, the largest offering ever made by the above company.

THE WAGNER MFG. COMPANY, Sidney, Ohio, state, in a circular to the trade, that the fire which destroyed a portion of their factory on September 6 will not interfere with their shipments in the least. Their line of goods includes high-grade Hollow Ware, Sugar Kettles, Mauls, &c.

CLINE MFG COMPANY, 67 West Washington street, Chicago, have just issued a catalogue of their specialties, illustrating and describing a new Tea and Coffee Steeper, Cline's Perfection Roaster and Baker, improved steam Washer, fire-proof Kettle, Turtle Cuspidor, Challenge steam Cooker, rotary Cake Cutter, Pot and Lid Lifter, Steak Pounder and Ice Chopper, Florentine Water Filter, Ideal toothed Bread Knife, steam Cooking Table, ornamental Clocks, Curling Irons, Foot Warmers, &c.

THE WOLFF GAS RADIATOR is the subject of a prominent announcement elsewhere in this issue made by the Wolff Gas Radiator Company, 164 Franklin street, New York City. A large illustration is shown of this device and its constructive features and operation are briefly commented upon.

BERGER BROS. of Philadelphia are calling the attention of architects and roofers to their facilities for supplying their well known Eave-Trough Hangers and Pipe Fasteners. These goods are being used on all classes of buildings and present a very neat appearance. The Hangers are now largely used for outside hanging troughs. The firm are, as usual, well stocked with a general line of roofers' and tinners' supplies and prepared to meet the demands of a heavy fall trade.

THE ROLLING MILLS of the McCullough Iron Company, Northeast, Md., which have been working on reduced time, were put into full operation this week in order to meet increased orders.

Penny-in-the-Slot Gas Meter.

The Liverpool *Mercury* describes the penny-in the-slot gas meter, previously mentioned, which has recently been introduced into that city for the benefit of the poorer class of persons who cannot, ordinarily, afford to use gas. There are now some 9000 of these meters in use in Liverpool, and the system is reported to work with complete success. The meter contains three dials, marked L, S and D, and no sooner has a penny been dropped into the slot than the hand of the "D" dial records it. When 12 pennies have been introduced the dial stands at "0," while the hand of the "S" records that 1 shilling's worth of pennies are in the drawer, and so on until £20 worth of gas is paid for. The hand can only move one way, so that by this invention the householder practically gets an indisputable receipt for the pennies he puts into the slot and the total amount he has paid for his gas. An indicator shows how many feet of gas are in the meter "paid for but unconsumed." When all the gas paid for has been used the flame does not at once go out, but under a new arrangement the meter automatically warns the householder that the supply is nearly exhausted by gradually lowering the flame at least one hour before turning the gas off.

A "nickel-in the-slot" telephone is the latest device, and it is said to be finding a good field of usefulness. One which has recently been placed in a hotel at Wilmington, Del., is thus described: All you are compelled to do is to drop in your nickel, dime, or whatever it may be, and the telephone does the rest. Slots are made for a nickel, dime, a quarter, half dollar and a dollar. When either of the above denominations is dropped in the slot, the telephone rings at the exchange, and then the operator knows how much money has been dropped in the slot and how long and to what point the person is entitled to talk.

The French Minister of Agriculture estimates that nation's wheat crop of the year at about 278,000,000 bushels, being 32,000,000 bushels less than last year. Compared with the estimates of consumption, this leaves a deficit of very nearly 52,000,000 bushels to be supplied to France from foreign sources.

TRADE REPORT.

The Iron Market.

Extraordinary efforts appear to be made by a number of steel works and rolling mills to secure work enough to start, or to get enough to keep running even at a slow rate. Naturally, distant markets are sought, and it appears that Western Pennsylvania is the principal aggressor, while the natural territory of the Eastern Pennsylvania mills is the favorite battle ground. These raids have a very unsettling effect upon values, which are really now only being established after what has amounted to practically two months' suspension of business. While, therefore, the announcements of the partial resumption of work at the mills may be regarded as encouraging so far as the volume of business is concerned, they imply woeful sacrifices so far as prices are concerned. Of course it was well understood that improvement could only develop after the tonnage of orders had reached a comfortable total for the mills, but few believed that the start could possibly be made from a lower range of values than that previously attained.

Pittsburgh openly quotes $19.50 for Billets, and even intimates that slightly lower prices would be accepted as a starter; and now comes the report that the Amalgamated Association has sent out circulars to its lodges to ask authority to propose to the manufacturers a reduction of 10 % in the finishing departments. Practically, if accepted by the manufacturers, this would mean an increased pressure from the Western mills, with their cheap crude material.

From Western markets, notably from Chicago and Cincinnati, come reports of very good sales of Southern Iron, but at very low prices. In New York a 5000-ton block of warrant Iron is being pressed for sale by bankers, and there is soon to be the spectacle of an auction sale of Charcoal Iron. Some of the wreckage is evidently being cleared away, since the chance has come to dispose of stuff at any price.

Pig Iron.—The New York market continues very quiet, and some sales agents observe even that consumers have again withdrawn. Reports of exceptionally low transactions, notably for Southern Iron, are gaining currency. There is now being offered by bankers, who a year ago advanced $6 a ton on Southern warrants, lots of No. 2 and No. 3 Southern Foundry and some Gray Forge aggregating a little over 5000 tons. It is reported also that a considerable block of Charcoal Iron is to be offered at auction in this city at an early date by a bank which had advanced on the Iron. Happenings like these are not likely to encourage confidence among buyers. To this must be added the fact that quite a number of Northern furnaces which formerly made exclusively all ore metal are using increasing quantities of cinder and are cutting prices accordingly. We quote Northern brands $14 @ $15 for No. 1; $13 @ $14.25 for No. 2, at tidewater. Southern Iron, same delivery, $13.25 @ $14 25 for No. 1; $12.25 @ $13.25 for No. 2; $11.50 @ $12.25 for No. 3; $11.75 @ $12.25 for No. 2 Soft, and $12.25 @ $12.50 for No. 1 Soft.

The accumulation of stocks has had a depressing influence on prices in the Philadelphia district, and some large buyers are reported to have been asked to make bids at lower figures than they have ever bought Iron for up to this date. There is a semblance of steadiness, but when any one likely to take a large lot comes along prices begin to soften at once. Carload and 50 to 100 ton lots command something pretty close to quoted rates, but on these terms the market is limited, so that quotations do not stand for much in times like these. All depends on the size and financial strength of the buyer, but in ordinary cases asking prices are about as follows for Philadelphia deliveries, and 20¢ @ 30¢ less at such points as Harrisburg, York, Baltimore, &c.: $13 @ $13 50, delivered, for Plain No. 2, $13.75 @ $14.25 for No. 2x and $14.50 @ $15 for No. 1x.

As yet there has been no improvement in the demand for Pig Iron in Pittsburgh and vicinity, but with increased operations among the mills and Steel plants, there should soon be a better Iron market. While production is lower than at any time since the long Coke strike, it is nevertheless true that stocks are also considerably heavier. Until this condition of affairs is righted by consumption overtaking production and cleaning up these stocks it is not to be expected that prices will show any improvement. The closing of the Rail mills has also knocked a large hole in consumption, and no improvement from this quarter can be expected for some time. In the Mahoning and Shenango valleys the same condition of affairs prevails, nearly all the furnaces having considerable Iron piled up. We quote as follows:

No. 1 Foundry	13 00 @	13.25	cash.
No. 2 Foundry	12.00 @	12.25	"
Charcoal Foundry No. 1	15.00 @	16.00	"
Charcoal Foundry No. 2	14.00 @	15.00	"

Considerably more inquiry is reported from Chicago for Coke Iron. The largest dealers state that the inquiry is better than for any time during the past two months, and in some cases comes from unusual quarters, indicating that consumers are not able to get the Iron they have been in the habit of taking. Thus far actual business has developed to only slight extent from this increased inquiry, although apparently reliable reports are out that two or three heavy transactions have been entirely closed in Southern Coke. Most of these were for Foundry Iron, all for deliveries running over 12 months, and of course all at very low prices. Shipments on contracts are heavier than they were and foundrymen report a better outlook among their customers. The feeling is decidedly better in every direction, but the impression is general that the return of activity will be gradual rather than rapid. Lake Superior Charcoal is still very dull. Prices are about as follows, subject to concessions for prompt cash or on large quantities:

Lake Superior Charcoal	$16.00 @ $16.25
Local Coke Foundry, No. 1	13.50 @ 14.00
Local Coke Foundry, No. 2	12.75 @ 13.00
Local Coke Foundry, No. 3	12.50 @ 12.75
Local Scotch	14.00 @ 15.00
Ohio Strong Softeners	15.75 @ 16.25
Southern Silvery, No. 1	@ 14.50
Southern Silvery, No. 2	@ 14.00
Southern Coke, No. 2	12.60 @ 12.85
Southern Coke, No. 3	12.10 @ 12.25
Southern, No. 1, Soft	12.60 @ 12.85
Southern, No. 2, Soft	12.00 @ 12.25
Tennessee Charcoal, No. 1	16.00 @ 16.50
Alabama Car Wheel	@ 18.85
Hocking Valley, No. 1	15 25 @ 15.50
Jackson County Silvery	16.50 @ 17.00

In Southern markets a decided increase is reported in the volume of business in Pig Iron during the week, which is evidently the result of a more confident feeling which pervades the trade and the better condition of the financial situation. Some buyers who have long contemplated taking advantage of the low prices current have bought some round lots of Pig Iron, and the sales in the aggregate were upward of 20,000 tons, mainly of Nos. 2 and 3 Foundry Iron. The sale was partly for spot cash, No. 2 Foundry going at $8.25 and No. 3 Foundry at $7.50, spot cash and for prompt shipment, and 25¢ @ 40¢ ₱ ton more for delivery the remainder of this year and one month into next year, f.o.b. Birmingham. If the demand keeps up there will soon be a scarcity of Iron in the South, for so many of the furnaces are out of blast that stocks are already at a low point. In fact, there is now more competition with the Northern furnaces than there is between the Southern furnaces. Besides the above sales there was rather more than the usual run of orders for carload lots, and there

was a fair run of Eastern orders. There is no movement in Charcoal Iron. Quotations as follows:

Foundry.

Southern Coke, No. 1	$12.75 @ $13.00
Southern Coke No. 2	10.75 @ 11.00
Southern Coke No. 3	10.25 @ 10.50
Ohio Soft Stone Coal, No. 1	15.50 @ 16.00
Ohio Soft Stone Coal, No. 2	14.50 @ 14.75
Lake Superior Coke No. 1	15.00 @ 15.25
Lake Superior Coke No. 2	14.00 @ 14.25
Hanging Rock Charcoal, No. 1	18.50 @ 19.00
Hanging Rock Charcoal, No. 2	17.50 @ 18.00
Tennessee Charcoal, No. 1	14.00 @ 14.25
Tennessee Charcoal, No. 2	13.00 @ 13.25

Car Wheel and Malleable Irons.

Standard Southern Car Wheel	17.75 @ 18.00
Lake Superior Car Wheel and Malleable	17.00 @ 17.25

Metal Market.

Pig Tin.—There has been a further advance in prices, and, while speculative deals have figured with no prominence, enough Tin has moved out from first hands to strengthen the position here considerably and materially reduce the margin of difference between prices for current month and later deliveries. A week ago November delivery commanded 0.55¢ ℔ lb more than spot stock. At the present time the difference is not over 0.20¢ and the early deliveries seem to be relatively the strongest. There has been a good, healthy consumptive demand, involving nearly, if not quite, as much Tin as usually passes from first hands at this season of the year. At the close of the week prices were up to about 20.20¢ for current month delivery, 20.40¢ for October and 20.50¢ for November and December delivery. Dealers' prices for small lots have been advanced about ¼¢ ℔ lb, and are now generally quoted at Banca Pig 22¢, Straits Pig 21½¢.

Copper.—The condition of the market is practically the same as was outlined in last week's report. New export purchases have been on a smaller scale and the home trade buying makes only a fair showing, but deliveries have cut deeply into surplus stocks, besides taking up a good percentage of current production. Prices are firmer and, upon the whole, rather higher, not only for Ingot, but for furnace material. Several hundred thousand pounds of Lake Superior Ingot have been sold at 9¾¢. That price was subsequently bid and refused. At this writing 9⅞¢ @ 10¢ are the popular quotations. Casting Copper is quoted at 9½¢, and 9½¢ @ 9⅝¢ seem to be the inside figures for common casting stock. A brisker demand from small consumers has been noted during the week, and quite a good amount of retail business has developed. Quotations for small lots remain unchanged, but prices seem inclined to harden, in sympathy with the advance in market price of Ingot Copper.

Sheet Copper.—Better business is reported in the market for Sheet Copper during the past two weeks. A marked increase in small orders, as well as in inquiries, appears to have developed since the easing in the general financial situation has set in. Stocks in retailers' and consumers' hands having for long been unusually small are becoming depleted, and the actual necessities of business have probably caused an augmented demand at the earliest date at which the necessary funds for payment could be procured. Prices for small lots remain the same as previously quoted, but there is no longer any talk of shading them on desirable orders.

Pig Lead.—Limited offering and very fair demand have combined to bring about a further advance in prices. Good-sized lots of Common Domestic have been sold for prompt and near future delivery at from 3.85¢ up to 3.92½¢, and the offering at less than 4¢ is now extremely light. Some lots could have been secured at 3.95¢ from second hands. Consumers are more liberally supplied than they have been for some time past, but all accounts go to show that stocks at producing points are unusually low, and the indications seem favorable for a firm market during the balance of the year. Jobbers' prices for small lots have been generally put up ⅛¢ @ ¼¢ ℔ lb. For American Pig 4 15¢ @ 4 25¢ is now asked, according to size of order. The retail demand is only moderate for the season of the year.

Lead Pipe and Sheets.—A fair business in manufactured goods is reported, but a reaction appears to have set in from the brisk demand which was experienced earlier in the summer, and sales all around fall considerably below the normal volume for the present season, largely owing to the depression in the building trade. No advance in prices on Sheet Lead and Pipes has yet been decided upon by manufacturers, but should the market price of Pig Lead continue to rise it is more than probable that the price-list will be advanced in the near future.

Spelter.—Sales in this quarter have not been equal to those reported last week, but a very fair business has been effected in a quiet way and the market shows quite firm tone. Ordinary Western brands would readily bring 3.77¢ @ 3 80¢ for early delivery. Speculative bids of as high as 3.85¢ @ 3 87½¢ have been made for distant future deliveries. Choice brands are held at the usual premium and have met with rather better sale.

Sheet Zinc.—A dull and perfunctory demand is all that can be said in regard to the market for Sheet Zinc. A revised list, referred to in another column, has been issued by the Matthiessen & Hegeler Zinc Company, which gives the price of Sheet Zinc in 600-lb casks as $4 ℔ 100 lb, and changes are also made in the extras and in the discounts. There is a disposition among dealers to lower the retail prices ¼¢ ℔ lb for small lots.

Tin Plates.—The market continues in much the same condition as was reported last week. There is, if anything, a better feeling and less inclination to weakness in prices, although for spot cash and substantial orders material concessions from popular quotations could probably be still obtained. Except in a few instances of Cokes for canners' use, absolutely nothing is being done in "futures." The market is entirely a spot one, but it has a healthy movement at that. A very fair business has been done during the past week in ordinary Cokes and Charcoal Ternes, and the demand appears to increase. Stocks in dealers' hands are ample, but not excessive. Consumers, however, are not holding any quantities of material, but are purchasing as their needs arise. The consumptive demand for domestic Ternes is reported as quite brisk, and manufacturers of this material are in some cases unable to fill all their recent orders. A London cable of September 13 to *The Iron Age* reports on the English market as follows: Tin Plate market has undergone very little change. Demand has been meager and stocks at Swansea have increased to 261,000 boxes in the face of stoppage of several works. Liverpool quotations are as follows:

IC Charcoal, Alloway grade	12/9 @ 13/3
IC Bessemer Steel, Coke finish	11/6 @ 11/9
IC Siemens " " "	11/9 @ 12/
IC Coke, B V. grade, 14 x 20	11/6 @ 11/9
Charcoal Terne, Dean grade	@ 11/6

Sheet Iron.—The demand for Black Iron shows a little more life, but one or two mills have recently resumed operations, which will further add to the floating stock of material, and probably prevent any advance in price, for which manufacturers may be looking. Prices quoted, although nominally unchanged, might be materially shaded on desirable orders. Galvanized Iron continues in fair demand. As some mills have resumed the production it is thought that supplies will fully equal demand and prevent any probable scarcity. Russia Iron shows little movement, owing to the financial depression, which has prevented consumers investing in what is regarded as a "fancy article." The season's first consignment of Russia has arrived, but it was nearly all taken beforehand, so there is little new stock in the market as yet.

We learn from W. J. Burton & Co., Detroit, Mich., that despite the stringency of money and hard times the sale of the Eastlake metal shingles has not been affected, orders and sales for the present time being in excess of those of last year. They have just supplied Eastlake shingles for roofing a high school and M. E. Church at Springlake, Mich., and have contracts for furnishing the same for two ward schools at Jackson, Mich., besides a number of residences.

Rau Bros, Louisville, Ky., dealers in stoves, tinware and hardware, have been burnt out. The insurance is said to cover the whole of their losses.

Chicago Report.

Scrap —Consumers at a distance are inquiring for Scrap, but are trying to buy at very low prices, so that dealers are still offering country collectors the following rates, delivered in Chicago:

	Per net ton.	Per lb
No. 1 Wrought Scrap	$7.00	....
Machinery Cast	6.00	....
Malleable Cast	5.00	....
Stove Plate (free of burnt)	4.00	....
Burnt Iron and Grate Bars	3.50	....
Sheet Iron and Hoops	2.00	....
Plow Steel and Breaking Stock	5.00	....
No. 2, such as Shovels, Hoes, &c	4.00	....
Old Boilers—whole (Iron)	4 00	....
" (Iron)—cut in single Sheets and Rings	6.00	....
Old Gas-Pipe and Boiler Tubes	5 00	....
Cast Borings	3.00	..
Turnings	4 00	...
Horseshoes	8 00	....
Copper Bottoms	....	5 ¢
Copper Clips and Heavy	....	6 ¢
Heavy Brass	....	5½¢
Light Brass	....	3½¢
Pipe Lead	....	2 1-10¢
Tea Lead	....	2 ¢
Zinc	....	2 ¢
Rubber	....	2 ¢

Anthracite.—Business is steadily improving, and the movement is now something like it should be at this season. Carload lots of 12 net tons or over are quoted as follows:

	Grate.	Egg, Sto. and Ch.
Chicago, Ill	$5.85	$6.10
Milwaukee, Wis	5.85	6.10
Kansas City, Mo	9.05	9.30
Council Bluffs, Iowa	9.05	9.30
Lincoln, Neb	9.20	9.45
Sioux City, Iowa	9.05	9.30
Aberdeen, S. Dak	9.10	9.35
Dubuque, Iowa	7.15	7.40
Madison, Wis	7.35	7.60
St. Paul, Minn	8.35	8.60
Burlington, Iowa	7.35	7.60
Des Moines, Iowa	8.80	9.05
Davenport, Iowa	7.15	7.40
St. Joseph, Mo	9.05	9.30
Leavenworth, Kan	9.05	9.30
Omaha, Neb	9.05	9.30

Colorado Anthracite.

COLORADO FUEL & IRON COMPANY.

Denver	$8.00
Pueblo	8.00
Colorado Springs	8.00
Leadville	8.00
Cheyenne, Wyo	10.00
All points between Denver and Missouri River	9.35

THE RAVEN STOVE POLISH COMPANY have removed their Chicago office to Saginaw, E. S., Mich., where their factory is located. They decided on this change in order to better facilitate business. We understand that they are having an exceedingly large trade, and are very actively at work in supplying the demands for their well-known line of goods.

THE WAGNER MFG. COMPANY, Sidney, Ohio, are sending out a circular letter stating that "though a portion of their factory was destroyed by a recent fire their shipments have not been in the least interfered with. Anything that may be needed in high-grade Hollow Ware, Sugar Kettles, Mauls, &c., will be promptly shipped and satisfaction guaranteed."

LALANCE & GROSJEAN MFG. COMPANY, 19 Cliff street, New York, favor us with their supplement No. 2, dated September 1, 1893. The supplement is devoted to Agate Iron Ware, White and Blue Enameled Ware, Retinned Ware, Pieced Tin Ware, Tinners' Stamped Trimmings and Japanned Pieced Ware.

CONDITION OF THE

Hardware Trade.

THE IMPROVEMENT which has been perceptible for the past few weeks still continues, and there is a noticeable increase in inquiries and in business. Most of the mills and factories which have been closed have resumed operations and others which have been working on short time are increasing their output. The improvement in the money market is evidently having its effect both on trade and collections.

With a view to ascertaining the condition of things among the trade throughout the country we have recently addressed inquiries to representative Hardware merchants among our subscribers in every State and Territory in regard to the volume of trade, character of stocks, prospects for business, &c. The replies to these inquiries have brought out a mass of definite and detailed information in regard to business in all sections and the feeling of the trade in reference to the future. In manufacturing communities merchants have evidently felt the financial stringency more severely than in other sections, and the silver States also report business as very dull. Taking the country as a whole, it appears, however, that many merchants have found trade nearly as good as in previous years. In many sections business was excellent in the spring, but July and August are generally referred to as having been exceptionally dull. In some States, however, business was fair during these months, notwithstanding the financial disturbance. Our correspondents report a general improvement as fall approaches, though merchants are cautious in buying and credits are scrutinized closely by jobbers and manufacturers. A gradual improvement in business is generally anticipated and on a more conservative and healthy basis than heretofore. Comparatively few merchants anticipate the usual volume of business during the remainder of the year.

STOCKS.

A very conservative policy is evidently pursued by the retailers in regard to the stocks of goods which they carry. As a rule stocks are considerably smaller than at this season, and a hand-to-mouth buying is generally pursued. Spring purchases were generally large, but stocks have been cut down as much as possible during this summer, the aim of the merchants being to carry as small an assortment as will meet the requirements of their trade.

PRICES.

Our correspondents report that while a few manufacturers are offering inducements for stock orders in the way of special discounts, the majority prefer to close their factories rather than cut prices, and jobbers also, as a rule, have refrained from urging purchasers. Merchants in many sections having been obliged to ask for extra time and extension, have not been in a position to either purchase largely or to endeavor to obtain lower prices.

COLLECTIONS.

Collections are very generally referred to as having been hard to make, but money appears to be easier during the past two or three weeks. The financial condition, as is well known, being the great obstacle to business, the lack of money which has prevailed and the distrust which has existed have had the effect of largely curtailing trade. Many of our correspondents, however, refer to collections as having been fair, but some of them allude to a disposition on the part of their customers to make the financial disturbance an excuse for deferring payments which it was in their power to make.

PROSPECTS FOR BUILDING.

The general impression is that after the buildings now in course of construction are completed little or no new work will be undertaken. A large amount of building was commenced in the spring, especially in the South, but fall work in nearly all sections of the country will be light on account of the financial stringency. Architects are not planning much new work and building is practically at an end for the year. In some sections work begun in the spring was abandoned in the summer for an indefinite time.

AGRICULTURAL CONDITIONS.

Owing to unfavorable conditions the crops of wheat, corn and other grains are below the average in most sections. There are, however, exceptions, and some States report excellent crops. The fruit crop has been good and has brought fair prices. The hay crop also, in some States, is large and the marketing of it will put a good deal of money into circulation. While prices for farm products are low, farmers are frequently referred to as in comfortable circumstances, owing to the good crops and good prices during the past two or three seasons. Many of them are referred to by our correspondents as disposed to hold their crops for better prices and as able to do so, as they are not encumbered with liens and mortgages. The effect of this will be to make money scarce with them and curtail their purchases to a considerable extent. Crops will, however, in many cases be marketed without unusual delay, and this will, it is expected, benefit business, as the money finds its way into trade circles.

PROSPECTS OF TRADE.

As a result of droughts and early frosts in some sections, destructive storms in others, short grain crops in the North and Northwest and a small cotton crop in the South, with the low prices which are ruling, and with factories closed or running but part of each week, the outlook for trade during the next few months, especially in view of the financial stringency, could not be expected to be especially prom-

ising. In the face of all these discouragements, it is the opinion of many conservative and intelligent Hardwaremen that if no further disaster overtakes the country an improvement in trade is assured. The States depending largely upon a single product, as the South upon cotton, the Northwest upon grain, the Silver States upon mining, &c., will, it is expected, be longer in recuperating than those States which have diversified interests.

Advices from Chicago. — Orders are stated to have increased every day last week for seasonable goods as sold by Shelf Hardware jobbers. The demand for staple goods and for straight Hardware is, however, improving but slowly, although every order contains a greater or less list of this character. The business running so largely to seasonable goods shows that merchants are still ordering only what they must have to meet the immediate or prospective pressing wants of their trade. The demand for Sheet Iron is notably heavy and jobbers are now complaining that their receipts from the mills are by no means up to contract and they are having difficulty in supplying the wants of their customers. The Cordage trade has made a decided gain in activity. Stocks at both factories and in jobbers' hands here were allowed to run so low during the summer that the fall demand has brought on a very heavy movement suddenly, and more orders have been entered during the last week than in several months previously. An immediate stiffening in price was the consequence; in some cases a gain of one cent per pound is reported. The Heavy Hardware jobbers are also doing much better. Last week witnessed quite a revival in this line. Inquiries are coming in frequently from the country trade, and seasonable goods are beginning to move in this line also. Sleigh stock is in request for the extreme Northwest. Collections are very fair from all localities.

Notes on Prices.

Wire Nails.—A moderate degree of activity characterizes the Wire-Nail market. A good many small orders are being received, and it is understood that negotiations are in progress with some large buyers. The market, in the matter of price, is not entirely regular. Some of the mills are holding firmly to $1.50, f.o.b. mill, on all ordinary lots, but other manufacturers are understood to be shading this figure slightly. Negotiations between the manufacturers, with reference to an organization which will result in the control of the market, are still in progress, but it is understood that some difficulties have been encountered, and it remains to be seen whether or not the manufacturers will be able to surmount them.

Advices from Chicago.—A better inquiry and much more business are reported by the Wire-Nail manufacturers. Some very good orders have been received the past week from large buyers who either believe that this is a good time to stock up or else find that their trade are making heavy drafts on such goods. The last may probably be the case, as the leading houses all report a good movement in progress. Manufacturers' prices have recovered to some extent from the recent decline, and one large concern has made a distinct advance of 5 cents per keg since our last report. The general quotation on factory lots is now close to $1.50, Chicago. Small lots from stock are selling at $1.55 to $1.60.

Cut Nails.—There is little new to report in the Cut-Nail market. Quotations are evenly maintained on a basis of $1.05 for carload lots, f.o.b. mill. More inquiry is reported, but the movement of Nails is comparatively small. Small lots from store in New York are held at $1.25 to $1.30.

Advices from Chicago.—A very fair movement from factory is reported in Cut Steel Nails. The inquiry in this line is increasing and the coming week promises to be one of even better trade. Prices are unchanged at $1.20 to $1 25, Chicago, for factory lots, and $1.30 for small lots from stock.

Barb Wire.—The Barb-Wire market is comparatively quiet, the volume of business being moderate. Manufacturers are desirous of obtaining orders, and as a result prices show indications of slight weakness. The market is represented by the quotation of $2.40 to $2.45 for carload lots at mill for Four-Point Galvanized.

Advices from Chicago —The demand for Barb Wire is very much better. The August movement in this line turns out to have been better than was expected at the time, as manufacturers estimate that it fell but 20 or 25 per cent. below August of the previous year. The gain on the business of July was very great, as the trade that month was only about one-half of that of last year. Jobbers report a better movement from stock, but only in small lots. The car load trade is going almost entirely to the manufacturers. Prices are unchanged, carload lots being quoted at $2.45 for Galvanized and small lots from stock $2.60. Special brands are selling at a good advance on these prices.

Washing Machines. — The Wayne Combination Washer, a description of which was given in our last issue, which is manufactured by the Anthony Wayne Mfg. Company, Fort Wayne, Ind., is sold at $42 per dozen. The following are the prices of the other machines of their manufacture:

	Per dozen.
No 1 Anthony Wayne Washers	$42
" 2 " " "	36
Wayne American Washers	33
No. 2 Western Star "	36
" 3 " " "	39

Market Wire. — The market for plain Wire continues stagnant, with only a very moderate volume of business. Some improvement, however, is noted, and inquiries are being made which indicate that some increase in the volume of trade may be expected. Prices are slightly lower than they were two or three months ago. Most of the business is done on the basis of net prices rather than by list and discount.

Bright Wire Goods.—The market for Bright Wire Goods continues open, there being no combination or agreement among the different manufacturers. The result is that prices are low and somewhat irregular, some of the manufacturers refusing to meet the extreme quotations made by their competitors.

Fruit Picker.—The Cleveland Novelty Company, Cleveland, Ohio, sell their Gray Fruit Picker, described in our issue of September 9, to the trade at $5 per dozen, net.

Pump Curbs and Tubing.—The all-metal Pump Curb and Tubing manufactured by Bellevue Pump Company, Bellevue, Iowa, and recently illustrated in *The Metal Worker*, is sold to the trade at the following net prices:

Kegler's Galvanized Iron Chain Pump Curbs, each	$2.50
Kegler's Galvanized Iron Chain Pump Tubing, per foot	$0.10
Couplings for Tubing, each	.15

Cordage.—The Cordage Market continues in substantially the same condition as for several weeks, and the trade are evidently awaiting developments. The questions in regard to the reorganization of the National Cordage Company are not yet settled, but the general expectation is that the business will be put in shape to protect the different interests involved, but it is not thought likely that an attempt will be made to control the market, a project the difficulty of which is apparent since the failure of the National Cordage Company in this direction. Nearly all the outside concerns are in operation and report a fair amount of business. Within the past week an improvement in the demand from the West has set in, but buyers are not placing their orders with any freedom, limiting their purchases to their early requirements. The stocks in some hands are, however, reported as exceptionally low. There is also a feeling that when the pending questions with regard to Cordage interests are settled there will be a stiffening in the price if business assumes a fair volume. It is recognized that the present price of Cordage is exceptionally low and it is claimed by the manufacturers that existing quotations do not yield any profit, the margin between the cost of the raw material and the finished product being exceptionally narrow. Some well-advised parties who take a sanguine view of the market think it not unlikely that there may be an advance of 2 to 3 cents per pound. While some improvement is probable, it has, however, to be remembered that the

competition between the different manufacturers will unquestionably continue active, which will have a tendency to keep prices down.

Sheet Zinc.—Under date September 6 Matthiessen & Hegeler Zinc Company, La Salle, Ill., issue revised prices on Sheet Zinc, in which changes are made in the rate, in the extras and in the discounts. The price is announced as $4 per 100 pounds for Sheet Zinc in 600 pound casks, of the thickness between Nos. 9 and 15, inclusive, and of the widths between 32 and 46 inches, and of the lengths between 84 and 90 inches. The following are the revised extras in cents per 100 pounds:

Nos.	5	6	7	8	9	10	11	12	13	14	15
32 to 40 x 84	30	20	10	05	....	.....	....	.....	.....	..	....
32 to 46 84 x 90	....	....	....	....	none	none	none	none	none	none	none
52 x 84	....	....	100	40	35	30	20	20	20	20	25
50 x 84	....	....	65	35	25	15	10	10	10	15	15
48 x 108	....	....	50	40	30	20	10	10	10	15	15
48 x 96	....	....	45	20	15	10	10	10	10	10	10
48 x 84	105	60	35	15	10	05	05	05	05	05	05
36 x 108	70	60	30	15	15	10	10	10	10	10	10
36 x 96	55	30	15	10	10	05	05	05	05	05	05
30 x 84	45	30	20	10	05	05	05	05	05	05	05
28 x 84	50	35	25	15	10	10	10	10	10	10	10
26 x 84	60	40	30	20	15	10	10	10	10	10	10
24 x 84	65	45	35	10	05	05	05	05	05	05	05

The extra on No. 4 36 x 84 is $0.55 per hundred pounds.

The charges for small lots are as follows:

In casks of 100 pounds (all numbers up to and including No. 12), 30 cents extra per 100 pounds.

In boxes of 100 pounds (not larger than 30 x 40 inches), 30 cents extra per 100 pounds.

In 200 and 300-pound casks (all numbers up to and including No. 14), 20 cents extra per 100 pounds.

The revised discounts are as follows:

Discounts.	First Class. 15 600 pound casks, and upwards.	Second Class. 10 to 14 600 pound casks.	Third Class. 5 to 9 600 pound casks.	Fourth Class. Under 5 600 pound casks.
Special	0 per cent.	0 per cent	0 per cent.	0 per cent.
Cash with order	3 " "	3 " "	3 " "	3 " "
Quantity	3 " "	2 " "	1 " "	0 " "
	6 " "	5 " "	4 " "	3 " "

All discounts are computed straight when money accompanies the order, and the quantity discount is added to special discount in all cases. If the remittance is received within ten days of the date of invoice the cash discount will be only 2 per cent. instead of 3 per cent. and not computed straight.

Apple Parers.—There is little new in the assortment of Apple Parers put on the market this year, and prices show but very little change since last season. The apple crop is generally referred to as light throughout the country, and it is not thought that there will be the usual consumption of Parers.

Glass.—There have been no interesting developments in the Glass market during the past week, and the demand is still for small lots. There is considerable difference of opinion expressed regarding the reported small stocks of Glass on hand. It has been recently estimated that the manufacturers of the country have nearly half a million boxes of Window Glass in stock, while the stocks of jobbers and sash and door manufacturers are supposed to represent another million boxes. These figures would probably not be considered large in prosperous times. Official quotations remain unchanged.

Old Rubber.—The market for Old Rubber continues dull. The little business that is done is at about the following prices, delivered in New York:

Car Springs, ton lots, ℔ lb.	.... @	$0.03¼
Rubber Shoes, carloads, delivered at factory, ℔ lb.	.... @	.03
Rubber shoes, less than carloads, ℔ lb	$0.2¼ @	.03⅛
Large Hose, ℔ ton	.... @	9.00
White Wringer Rolls, ℔ lb.	.... @	.04¼
White Syringes, ℔ lb	.... @	.05

Old Metals.—The demand for Old Metals continues light, and prices are very low. In Scrap Iron, however, the market at last shows a better feeling, after a long period of absolute stagnation. There has been a marked increase in inquiries, with some scattered orders, since the first of the month. Some of the mills now starting up will probably become buyers within the next few weeks, and dealers are looking for better trade, and possibly better prices, in the near future. New York quotations are given as follows:

Heavy Copper	℔ lb 6¾¢
Light and Tinned Copper	℔ lb 6¼¢
Heavy Brass	℔ lb 5¼¢
Light Brass	℔ lb 4½¢
Lead	℔ lb 2¾¢
Tea Lead	℔ lb 2½¢
Zinc	℔ lb 2½¢
No. 1 Pewter	℔ lb 14¢
No. 2 Pewter	℔ lb 6¢
Wrought Scrap Iron, ℔ gross ton	$14.00 @ $15.00
Heavy Cast Scrap, ℔ gross ton	12.00 @ 13.00
Stove Plate Scrap, ℔ gross ton	7.00 @ 8.00
Burnt Iron (delivered at mill) ℔ gross ton	5.00 @ 6.00

Old Rags, Paper, &c.—Business in these materials shows some indications of improvement, the demand from Paper mills having revived to a moderate extent during the past week or two. Quotations for Old Rags, Paper, &c., delivered in New York are given as follows:

No. 1 White Rags	℔ lb 3	@ 3¼¢
No. 2 White Rags	℔ lb	1¾¢
Mixed Rags	℔ lb	¾¢
Blues and 3ds	℔ lb	1 ¢
Hard Sized White Shavings	℔ lb	2½¢
No. 1 White Book Shavings	℔ lb 2	@ 2¼¢
No. 2 White Book Shavings	℔ lb	1¼¢
Light Book Shavings	℔ lb	¾¢
No. 1 Mixed Shavings	℔ lb	1 ¢
No. 2 Mixed Shavings	℔ lb	½¢
No. 1 Printed Books	℔ lb 1	@ 1¼¢
Ordinary Mixed Books	℔ lb ½	@ ¾¢
Newspapers	℔ lb	½¢
No. 1 Manila Paper	℔ lb 1	@ 1½¢
No. 2 Manila Paper	℔ lb ⅝	@ ¾¢
Bogus Paper	℔ lb	½¢
Common Paper	℔ lb ⅜	@ ½¢
Straw Chips	℔ lb ½	@ ⅝¢
Binders' Clippings	℔ lb ½	@ ⅝¢
Jute Butts	℔ lb	1 1-10¢
No. 1 Jute Bagging	℔ lb	1¼¢
Mixed Bagging	℔ lb ¾	@ 1 ¢
No. 2 Bagging	℔ lb ½	@ ¾¢
Hemp Twine	℔ lb	2¼¢
Manila Rope	℔ lb	2½¢
Jute Rope	℔ lb 1½	@ 1¾¢
Mixed Rope	℔ lb ¾	@ ⅞¢

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CHICAGO, SEPTEMBER 14, 1893.

Tin—

Straits pigs.....22½¢

Imported Tin Plates—

Charcoal Plates.—Bright.

Guaranteed Plates command special prices, according to quality.

		Per box.
	IC, 10 x 14	@ $6.75
	IC, 12 x 12	@ 6.75
	IC, 14 x 20	@ 6.75
	IC, 20 x 28	@ 13.50
Calland and Melyn Grade	IX, 10 x 14	@ 8.75
	IX, 12 x 12	@ 8.75
	IX, 14 x 20	@ 8.75
	IX, 20 x 28	@ 17.50
	DC, 12½ x 17	@ 6.50
	DX, 12½ x 17	@ 8.50
Allaway Grade,	IC, 10 x 14	@ 6.50
"	IC, 12 x 12	@ 6.50
"	IC, 14 x 20	@ 6.50
"	IC, 20 x 28	@ 13.00
"	IX, 14 x 20	@ 8.00
"	IX, 20 x 28	@ 16.00

Coke Plates—Bright.

	Per box.
Steel Coke—IC, 10x14, 14x20.	$5.85 @$6.00
IC, 14x20.90 ℔	5.60 @ 5.75
IC, 14x20, 100℔	@ 5.85
10 x 20	8.75 @ 9.00
20 x 28	11.70 @12.00
X, 10x14, 14 x 20	@ 7.50
B.V. Grade. IC, 10x14, 14x20.	5.85@ 6.00

Charcoal Plates.—Terne.

Guaranteed Plates command special prices, according to quality.

Hansel and Dean Grades.—	
IC. 14 x 20	@ $5.62½
20 x 28	@ 11.25
IX. 20 x 28	@ 14.25
Worcester Brand and equal.—	
IC, 14 x 20	6.12½@
IC, 20 x 28	12.25 @
IX, 14 x 20	7.62½@
20 x 28	15.25 @

American Tin Plates.

Charcoal Plates.—Bright.

Irondale, A. A.—IC, 14 x 20	$7.00
" " IX, 14 x 20	9.00
" " IXX, 14 x 20	11.00
" " IC, 20 x 28	14.00
" " IX, 20 x 28	18.00
" " IXX, 20 x 28	22 00
Florence.—	
IC, 10 x 14, 12 x 12, 14 x 20.	$6.75
IX, 10 x 14, 12 x 12, 14 x 20.	8.50
Palma.—	
IC, 10 x 14, 12 x 12, 14 x 20.	$7.25
IX, 10 x 14, 12 x 12, 14 x 20.	9.25

Each extra cross $2.00 and 20 x 28 Double these prices.

Brilliant, Tissue Packed, IC, 14 x 20.	$9.25
Royal extra, IC, 14 x 20	7.25
Merlon, IC, 14 x 20	7.00
Almond, IC, 14 x 20	6.50
Mint, IC, 14 x 20	6.25

Coke Plates.—Bright.

Elwood.—IC, 14 x 20	$6.00
" IC, 20 x 28	12.50

Roofing Plates.

Arch, IC, 20 x 28	@$11.75
Crescent, IC, 20 x 28	@ 12.25
Crescent, IX, 20 x 28	@ 15.25
Empire, IC, 20 x 28	@12 50
Empire, IX, 20 x 28	@15.50
Hickory, IC, 20 x 28	@ 12.75
" IX, 20 x 28	@ 15.75
Alaska (heavily coated), IC, 20x28	@$14.50
Alaska IX, 20 x 28	@ 17.75
Special, IC, 20 x 28	@ 15.50
" IX, 20 x 28	@ 18.50
Merchant's Roofing (extra coated), IC, 20 x 28	@$17.75
Merchant's Roofing (extra coated), IX, 20 x 28	@$21.50
Merchant's Old Method, (extra heavily coated), IC, 20 x 28	@$19.75
Merchant's Old Method (extra heavily coated), IX, 20 x 28	$23.60
Irondale A:	
IC, 14 x 20	$6.25
IX, 14 x 20	7.75
IC, 20 x 28	12.50
IX, 20 x 28	15.50
Westmoreland:	
IC, 14 x 20	$6.25
IC, 20 x 28	12.50
Elwood:	
IC, 20 x 28	$12.00
Juno:	
IC, 14 x 20	$5.75
IC, 20 x 28	11.50
Illinois, Old Method:	
IC, 20 x 28	$17.00
E. L.:	
IC, 20 x 28	$12.50
Jessie:	
IC, 20 x 28	$12.00
Scott's Extra Coated, Stamped and Resquared, IC, 14 x 20	$9.50
Scott's Extra Coated, Stamped and Resquared, IX, 14 x 20	11.00
Scott's Extra Coated, Stamped and Resquared, IC, 20 x 28	19.00
Scott's Extra Coated, Stamped and Resquared, IX, 20 x 28	22.00
Neville, Stamped, IC, 14 x 20	6.25
" " IX, 14 x 20	7.50
" " IC, 20 x 28	12.50
" " IX, 20 x 28	15.00
Taylor's Old Style, IC, 14 x 20 (Stamped and Resquared)	$9.50
Taylor's Old Style, IC, 20 x 28 (Stamped and Resquared)	19.00
Taylor's Roofing, IC, 14 x 20 (Stamped and Resquared)	8.25
Taylor's Roofing, IC, 20 x 28 (Stamped and Resquared)	16.50
Columbia, IC, 14 x 20 (Stamped)	7.25
" IC, 20 x 28 (Stamped)	14.50
Maple, IC, 14 x 20 (Stamped)	6.75
" IC, 20 x 28 (Stamped)	13.50
Willow, IC, 14 x 20	6.50
" IC, 20 x 28	13.00
Knoxall, IC, 14 x 20	6.25
" IC, 20 x 28	12.50
Globe, IC, 14 x 20	6.00
" IC, 20 x 28	12.00
Miami, IC, 14 x 20	6.00
" IC, 20 x 28	12.00
" IX, 20 x 28	15.00
" (Redipped), IC, 20 x 28	17.00

Tin Boiler Plates.

	Per box of 100 sheets.	Per box of 112 sheets.
X, 14 x 28	$13.00	$13.00
XX, 14 x 28	14.50	14.50
X, 14 x 31	14.50	15.80
XX, 14 x 31	16.50	17.50
X, 14 x 56	29.50	16.50
XX, 14 x 56	32.50	18.20
X, 14 x 60	31.50	17.65
XX, 14 x 60	35.50	20.90

Sheet Iron—

Black.

	Common American	Refined.
Nos. 10 to 16	℔ 2 7-10¢	3 3-10¢
17 to 20	℔ 2 8-10¢	3 4-10¢
21 to 24	℔ 2 9-10¢	3 5-10¢
25 and 26	℔ 3¢	3 6-10¢
27	℔ 3 1-10¢	3 7-10¢

Russia, Planished, &c.

Genuine Russia, all numbers....13¢ net.
Patent Planished....℔ A, 10½¢; B, 9½¢ dis. 5%

Galvanized.

Juniata or first quality.....dis. 70&5%

Copper—

Ingot.

Lake.....11¾¢ @ 12¼¢
Casting Brands.....11¢ @ 11¾¢

Sheet and Bolt.

Discount, 25%.

Copper Bottoms.

Discount, 25%.

Seamless Brass and Copper Tubes.

Base price, 17½¢, Chicago, with extras according to size.

Copper, Bronze and Gilding Tube, 3¢ ℔ additional.

Brazed Brass Tubing.
(To No. 20 inclusive.)

Add freight from New York to Chicago to these prices, or 50¢ ℔ 100 ℔.

Above 5-16 inch to 3 inch inclu	35¢
Plain, above 3 inch	45¢
Plain, 5-16 inch	45¢
Plain, ¼ inch	60¢
Plain, 3-16 inch	$1.00
Plain, ⅛ inch	$1.50
Fancy Tubing, Brass, to No. 20 incl	43¢ ℔
Bronze Tubing, 3¢ ℔ more than Brass	

40 & 35 %

Roll and Sheet Brass.

Discount, 35 @ 40%.

Slab Spelter—

Western Spelter.....5

Sheet Zinc—

600 ℔ casks.....6¼¢
300 ℔ casks.....6½¢
Loose sheets.....6¾¢

Lead—

Soft Pig Lead.....4¼¢
Bar.....4.60¢@5¢
Pipe.....5½¢, dis. 10¢
Block Tin Pipe.....35¢
Sheet.....6¢, dis. 10%

Solder—

½&½.....13¢@13¼¢
Extra Wiping.....11½¢

The prices of the many other qualities of Solder in the market indicated by private brands vary according to composition.

Antimony—

Cookson.....12¢@12¼¢
Hallett's.....11¼¢@11½¢

Wrought-Iron Pipe—

List on following page.

1¼ and under, Plain	57½&10%
1¼ and under, Galv.	52½&10%
1½ and over, Plain	67½&10%
1½ and over, Galv.	60&10%
Boiler Tubes, list Oct. 24, 1892	65@67½%
Casing, list Nov. 16, 1892	52½%
Inserted Joints Casing, list Nov. 16, 1892	47½%
Steel Boiler Tubes	27½%
Cold Drawn Seamless Steel Tubing	50%

Cast-Iron Soil Pipe—

Cast-Iron Soil-Pipe, Tarred; sizes 2 to 6 inches, inclusive.....dis 70&2½%
Other sizes.....dis 60%

Leader Pipes—

Abendroth's Galv. Spiral Riveted	60%
Austin's Corrugated	60%
Gordon & Gilbert's Corrugated	60%
Ritchie's (Galv. Iron only) Cor'd	60%
Ritchie's Spiral Lock Seam, Galv'd	50%
Austin's Spiral Ribbed Pipe	60%
Plain Adjustable Elbows	60%
James A. Miller Bros. (Galv'd Iron only) Corrugated	60%

Furnace Fittings—

Discount from Excelsior Steel Furnace Co.'s list.....50%

Steel Roofing—

Perfection	$3.75 square
Climax	$3.50 square
The Lloyd Spanish Tiling	$4.50 square

Metallic Shingles—

Cushman's	$1.25 square
Merchant & Co.'s Spanish Tiles:	
Copper, 14 oz.	$36.00 square
Tin	$9.75@$14.25 square
Steel, painted	$9.00 square

Drain Pipe—

Discount from list.....50%

Paints Oils, &c.—

Deodorized Benzine	7½@8 ¢
Iron Paint, Bright Red	℔ 2 ¢
" " Brown	℔ 1½¢
" " Purple	℔ 2½¢
" Ground in oil, B. Red	℔ 6½¢
" Ground in oil, Red	℔ 6½¢
" Ground in oil, Brown	℔ 5½¢
" Ground in oil, Purple	℔ 6 ¢
Linseed Oil, Boiled, in bbls.	53¢
Linseed Oil, Raw, in bbls.	50¢
Mineral Paints	2@4¢
Orange Mineral	10¾¢
Pure White Lead in Oil	6¾@7¼¢
Dry White Lead in bbls	6¼@6¾¢
Red Lead, American	7@7½¢
Red Venetian, English, dry	$1.65@$1.70
Red Venetian in oil; asst'd cans, kegs	8½¢ ; 7½¢
Sipe's Japan Oil, in bbls, ℔ gal.	84¢
Spirits Turpentine, in bbls., ℔ gal.	32½¢
Asphaltum, Trinidad Refined, ℔ ton	$45
Tarred Felt, 1 Ply, ℔ 100 ℔	$1.65
Tarred Felt, 2 Ply, ℔ roll 108 sq. feet	$1.50
Tarred Felt, 3 Ply, ℔ roll of 108 sq. feet	$2.00
Roofing Pitch, ℔ bbl. of 300 ℔	$3.20

NEW YORK, SEPTEMBER 15, 1893

The following quotations are for small lots.

Aluminum—

No. 2 Grade Metal, in ton lots..℔ ℔, $0.75
No 1 (guaranteed to be 98 % pure and over), in ton lots .....℔ ℔ .90
Lots less than 1 ton, 10¢ ℔ ℔ additional.

Antimony—

Cookson.....℔ ℔, 11¢
Hallett's.....℔ ℔, 10½¢

Brass—

Planished.....net
Roll and Sheet.....35@40%

Brass and Copper Tubes
Brazed Brass Tubing—

List May 20, 1889.

	Per ℔.
Plain, to No. 20 inclusive, above 5-16 inch to 3 inch inclusive	$0.35
Plain, to No. 20, above 3 inch	45
Plain, 5-16 inch to No. 20	45
Plain, ¼ inch	60
Plain, 3-16 inch	1.00
Plain, ⅛ inch	1.50
Fancy Tubing to No. 20, inclu	43

35@40%

Copper and Bronze Tubing—

3¢ ℔ ℔ more than brass.

Bronze, Tobin—

Drawn Rods for Bolts, Forgings, &c

Over ¼ to 3½ inches inclusive....17¢ ℔ ℔
Over 3½ to 5 inches inclusive.....18¢ ℔ ℔

Piston Rods, Finished True, Smooth and Straight.

Over ¼ to 3½ inches inclusive....18¢ ℔ ℔
Over 3½ to 5 inches inclusive.....19¢ ℔ ℔

Clips—

Buffalo Damper: Nos. 1, $1.25; 2, $2.50 per doz.....40&10%

Conductors—

Corrugated. *Round or Square—*

Galvanized	60%
Galvanized, Locked Joints	60%
Tin	60%

Spiral Riveted—

Galvanized	50%

See also *Elbows and Shoes; Eave-Trough Miters; Strainers, Conductor.*

Conductor Strainers—See *Strainers, Conductor.*

Copper—

Bottoms, Pits and Flats....25@25&5%

Ingot.

Lake	11¢
Ansonia Grade Arizona	10½¢
Ansonia Grade Casting	10¢
Planished	net
Sheet and Bolt	25&25&5%

Tubes—See *Seamless Brass Tubes.*

Coppers, Soldering—

See *Irons, Soldering*, in Current Hardware Prices.

Damper Clips Buffalo—

See Clips, Buffalo Damper.

Eave Troughs—

Lap or Slip Joint, Galvanized	60&10%
Lap or Slip Joint, Terne	60%

Eave-Trough Mitres—

Lap or Slip Joint.....list, net

Elbows—
Plain Adjustable—

Tin	70%
Galvanized	70%

Crimped Tubing—

Re-Tinned or Galvanized.....35%

Stove-Pipe—

Buffalo Four-Piece.

4½	5	5½	6	7 inch,
$0.78	.87	.90	.99	1.20 per doz.

20 %

Elbows and Shoes—

Flat Crimp.

Tin	35%
Galvanized	35%

Corrugated.
Flat Crimp.

Galvanized	60%

Round or Square.

Tin	60%
Galvanized	60%

Iron, Sheet—

Black.

	Common American.	R. G. Cleaned American.
Nos. 10 to 16	℔ ℔, 2½	3 10¢
Nos. 17 to 20	℔ ℔, 2.85	3.10¢
Nos. 21 to 24	℔ ℔, 2.90	3.20¢
Nos. 25 and 26	℔ ℔, 3.05	3.30¢
No. 27	℔ ℔, 3.15	3.40¢
No. 28	℔ ℔, 3¼	3½¢
American B. B.	℔ ℔, 4¢@4½¢	

Russia, Planished, &c.

Genuine Russia, according to assortment.....℔ ℔, 11¾@12½¢
Patent Planished....℔ ℔, A, 10¢; B, 9¢, 5%
Craig Polished Sheet.....℔ ℔, 8½¢

Galvanized.

	R. B.
Nos. 10 to 16	70&2½&5%
Nos. 17 to 22	
Nos. 23 to 24	
Nos. 25 to 26	
No. 27	
No. 28	
Nos. 29 and 30	70&5%

Filter Joints—

Lee's.....33⅓

Lead—

American Pig	4.15¢@4¼¢
Bar	4½¢
Pipe	6½¢, 20%
Tin Lined Pipe	15¢, 20%
Block Tin Pipe	37½¢, 20%
Sheet	7¢, 20%

Old Lead in exchange, 3½¢ ℔ ℔.

Metal, Expanded—

Manufacturers' list No. 5.

Lathing	10%
Fencing, Painted Sheets	20%
Netting, Painted Sheets	20%
Door Mats, Galvanized	25%
Window Guards, Paneled	15%
Tree Guards, Paneled	15%

Mitres Eave-Trough—See *Eave-Trough Mitres.*

Paints Oils &c.—

Lead, Amn. White, in oil	6¾ @ 7¼
Lead, Red, bbls. and ½ bbls.	6½ @ 7
Lead, Red, kegs	6½ @ 7
Ocher, American	1 @ 1¼
Red, Venetian, American	1½ @ 2½

THE METAL WORKER.

NEW YORK AND CHICAGO.

Saturday, September 23, 1893.

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The Habit of Dating.

If there is any one thing of importance next to the inherent value of calculations, sketches, memoranda and the like it is a knowledge of the time at which they were made. It is a very simple matter to put a date on everything, once the habit is established, but a very exasperating matter to have it missing when a knowledge of it would instantly settle a vexed question of priority. Almost worse than no date at all is the use of the word *new* to indicate the most recent. When one looks through a lot of drawings and finds—as may be done in well-known establishments—a lot of successive designs of the same article, each entitled *new*, he wonders what service the draftsman thought he was rendering a future generation by the use of this indefinite and aggravating designation. In these days of time and dating stamps there is no excuse for not forming the habit of dating everything, large or small, important or otherwise, and thereby avoiding all vexation and discussion over what is a very small thing to omit, but a very great thing when omitted.

The Modern Plumber.

It is doubtful if there has been an advance within recent years in any other trade equal to that which has been made in plumbing. To-day there is added to the manual skill of the trade a fund of scientific information and technical knowledge that places a true modern representative of the craft on a level with many professional men. That there will always be workers and thinkers in all trades is conceded, and, though the words "sanitary engineer" are frequently displayed as a sign where they are a misnomer, competent sanitary engineers exist and are the outgrowth of the progress in the trade. Some of the very best are practical plumbers who have read and studied until their applied science is more valuable than that of their more deeply learned brother, who is apt to become theoretical, particularly when the value of the result and the cost of its production are compared. The percentage of valuable thinkers is always unequal to the demand, and this fact will guarantee employment for the sanitary engineer, as the character of the work required is elevated above the education of the average man. This advance in the trade is pleasant to note, and it is reflected by the inquiries received from all sections for information on subjects that ten or twelve years ago were not of interest to the craft. The present seems an era of regulation, tending to better plumbing and sewerage all through the country, and those who would reap the benefit must understand and meet the requirements or be left in the march of progress.

Starting Up the Heaters.

There are two methods of leaving steam heating and hot-water heating apparatus when discontinuing their use in the spring. One method is to leave the apparatus filled with water and the other is to draw off the water while hot, and let the apparatus dry itself out by its own residual heat. Of course in a steam heating apparatus only the boiler and the return mains and risers are thus filled up to a level with the top of the boiler. In a hot-water apparatus the whole system is filled. Water standing in an inclosed space hermetically sealed, after having been exposed for a time to a boiling temperature, will remain sweet indefinitely. But if, as is generally the case in steam heating apparatus, access of air to the interior of the apparatus is permitted through air valves, and sometimes around the stems of radiator valves which are imperfectly packed, the water may become putrid and acquire the smell common to all stagnant water. The water may be rendered sweet again by continued boiling, but it will require a considerable time by evaporation into the air to free it perfectly from the stagnant odor. Hence, it is often the case in steam heating plants not provided with automatic air valves connected with drip pipes that in filling the radiators with steam when firing up in the fall a very disagreeable and unwholesome odor is caused to pervade the house. This will not occur when the apparatus is dried out in the spring, and it may be wholly avoided when water has been left in it during the summer season by drawing off the water which has stood in the apparatus and replacing it with clean water before firing up. It is supposed by many that the interior of a heating apparatus suffers less from rust when filled with water and standing cold than when emptied; and this is the reason for leaving the apparatus filled when it goes out of use, but water in a heating boiler should always be ascertained to be pure before the fire is lighted in the fall.

Young Men's Institute.

On Tuesday evening, October 3, special exercises will be held in the hall of the Young Men's Institute, 222 to 224 Bowery, New York, to formally open the educational work for the season of 1893–94. This institution has for several years been doing a very valuable work in offering to young men engaged during the day exceptionally good evening classes in subjects bearing directly on their daily work. There are technical subjects which assume a prominent place in the curriculum; classes in carriage drafting, steam engineering, practical electricity, mechanical and architectural drawing and freehand drawing; also penmanship, bookkeeping, shorthand, typewriting, English grammar and composition, vocal music, glee club and first aid to the injured. The school year continues until May, when prizes, diplomas and certificates are awarded. The classes are open to all young men from 17 to 35 years of age.

The Value of Criticism.

The most powerful factor in obstructing the spread of error is just and generous criticism. Unfortunately, this altogether useful and salutary means for promoting the spread of sound knowledge and intercepting falsehood is too often rendered bitter and offensive by the language in which it is couched. Not content with pointing out the error which he essays to correct, or the deficiency in the statement of fact which he has discovered, the critic is too frequently tempted to indulge in the language of sarcasm and to wound the feelings of the one whose failings he points out by the needless use of personal allusions or derogatory epithets, that serve no purpose whatever but to gall and irritate. If only people would remember when assuming the *rôle* of critic that the object of criticism is only to bring out truth, and that unless the person criticised has rendered himself obnoxious on such grounds as justify the shafts of sarcasm, the mere fact that he has committed an error does not justify an attack upon his character, his acquirements or his motives.

The Sheet-Iron Business.

The wonderful vitality of the iron and steel sheet business has been forcibly illustrated during the past two months of depressed trade. Bar mills and guide mills have almost without

exception been idle during that time throughout Ohio, and very little has been done in that line in other States. At the same time several sheet mills commenced operations about the middle of August, and the number has daily increased until at least 40 light sheet mills are known to have been in operation last week in Ohio, Indiana, Kentucky and Western Pennsylvania, some of them running two turns and others three turns during 24 hours. This does not include tin mills. Those included are mills making light sheets from No. 18 to No. 30 gauge. The total product of these mills for the week ending September 9 would be not less than 2000 tons. The principal uses to which this material is put are roofing, galvanizing and stove pipe, large quantities being used for stamped goods, kitchen utensils, stoves, and a great variety of purposes.

Machinery Sales at the World's Fair.

The commercial side of exhibiting at the World's Fair is one of the subjects usually and very properly kept in the background. If every exhibitor was to look for quick commercial results, and to undertake no display unless he was pretty thoroughly satisfied that he would be reimbursed his outlay by the time the show was over, there would perhaps never be a universal exposition worth looking at. The very people taking part would be makers of novelties of the catch-penny order, for which there is a good sale wherever crowds can be collected. Most exhibitors engage in an affair of this kind for the sake of the permanent results flowing from such an advertisement of their products, or to contribute to the glory of their country, of whose every achievement they are proud, or for the gratification of personal pride in showing to representatives of the world at large some triumph of ingenuity or of patient, persistent, indomitable application. And yet there is hardly an exhibitor who does not hope for some immediate return on the investment necessary to make an attractive exhibit. Even those who enter the lists from motives of patriotism and for personal glory are gratified to have their enterprise rewarded by substantial recognition. The inventor of the most ingenious piece of mechanism in the world may be flattered by the homage of the crowds that throng to see it, but such pleasure is as "sounding brass or a tinkling cymbal" to the gratification felt by the receipt of orders for the duplication of the device from practical people who appreciate its true value.

The World's Fair has thus far been a great success in attracting visitors, notwithstanding the stress of financial trouble throughout the country. There has also been a fair representation of foreign visitors, though by no means so large as had been expected. Exhibits have been quite thoroughly inspected by these visitors, who seem to have almost made it a religious duty to see everything in any way worth seeing. Registers kept by exhibitors of machinery generally are well filled, showing that they cannot complain that they have been altogether thrown in the shade by the numerous lighter attractions provided by the World's Fair managers. But when the question is asked as to the direct commercial result of the exhibits made, the answers returned show a wide variation. There are, for instance, some large makers of machinery very popular in certain trades who state that they have not taken an order for a single machine, although their exhibit is a good one, covering their entire line, and each machine can be shown in actual operation, doing its most perfect work as a matter of course, as it is run by an expert from the factory. Others report a few sales, but by no means what they expected when they looked forward to the World's Fair and heard the extravagant estimates made of the probable attendance. There are some, however, who are well pleased with what they have accomplished in booking orders and who will go home when the fair is ended well satisfied with the commercial results and ready to prepare for the next universal exposition with a great deal of enthusiasm.

The financial stringency is, of course, held primarily responsible for the lack of orders from visitors. Many exhibitors of standard machines report their callers making the remark very frequently that they "need just such a machine, but the times are now too hard and work is too slack to think of buying one." The manufacturers of machines somewhat out of the ordinary line, or making a decided improvement on the tools of the same character heretofore in use, have been more fortunate. Their orders may be affected to some extent by the unsettled financial conditions, but they are nevertheless doing very well, and find no fault with the business outcome of their World's Fair venture. If it were possible to get from all the American machinery exhibitors exact reports of the domestic and foreign orders entered, we believe the aggregate thus shown would be quite satisfactory and would be a conclusive argument in favor of making exhibits at such expositions. The fragmentary knowledge we have thus far been able to obtain covers sales made to almost every civilized country on the globe and to some that have thus far not been classified under this head in the geographies.

Something may be said in this connection with regard to the proper reception of visitors by exhibitors. Not every attendant in charge of an exhibit is by any means an ideal salesman of machinery. For many men who have been sent to the World's Fair to represent large interests look upon their function in this particular as one that can be easily discharged with very little actual labor or trouble. Some regard their appointment to such a responsible post as leave to take a holiday, and they are seldom found at the exhibit over which they are supposed to preside, but are "taking in the exposition." Others treat callers with indifference, exerting themselves but slightly in the effort to entertain and interest possible customers. The politeness of most people, especially foreigners, restrains them from entering an inclosed space unless they are specially invited to walk in. An exhibit of ingenious automatic machinery may mutely invite closer inspection, but an intervening railing which presents a barrier seems to warn the outsider to stay out, especially if there is a closed gate which some very acute railing maker has designed so that there is no visible way by which it can be opened. Unless an attendant is on the alert and personally invites a passer-by to enter who seems interested, he may miss many golden opportunities to secure customers. Machines do not sell themselves, and in these days of competing specialties there is hardly a piece of mechanism which does not have a competitor accomplishing the same purpose in a slightly different way. Hence, alertness and readiness to cultivate acquaintance with visitors are indispensable requisites for good and efficient attendants at exhibits. The most successful sellers of machinery at the exposition are men of this character. We recall one in particular who has made numerous foreign sales, who will even invite his visitors to get under a machine if they wish, so as to be able to see the feeds more thoroughly. He says his machines have been put on exhibition to be exhibited, and that he has greater success in making sales by appearing to conceal nothing than if he were to be in a chronic state of fear that foreign visitors were merely inspecting in order to steal American ideas.

Water at High Pressure.

The following item from an exchange treats of an interesting question, but the author seems to have forgotten the unfortunate result of former enterprises which attempted to make use of water under high pressure. Important progress, says our contemporary, is believed to have been made in solving the problem of storing heat, one of the latest suggestions in this line being that by Mr. Halpin, a London engineer, who proposes to use boilers and engines, but to store heat during the day in specially constructed reservoirs. As the water in the boilers is raised to 250 pounds pressure it is conducted to cylindrical reservoirs, resembling English horizontal boilers, and stored there for use when wanted. In this way a comparatively small boiler plant can be used for heating the water to 250 pounds pressure all through the 24 hours of the day, and the stored water may be drawn on at any time, according to the extent of demand—the steam engines to be worked by the steam generated by the release of pressure from this water, and the valves to be arranged in such manner that the steam shall work at 130 pounds pressure. In favor of this plan the statement is made that a reservoir 8 feet in diameter and 30 feet long, containing some 84,000 pounds of heated water at 250 pounds pressure, would supply 5250 pounds of steam at 130 pounds pressure—these data being the result of investigations made with great care by Professor Unwin.

THE LETTER BOX.

An Ingenious Safety Valve.

From C., *New York.*—The occasional appearance of an item narrating the explosion of a low-pressure steam boiler used for heating purposes prompts me to suggest a way (which, for all I know, may have been frequently tried, but which I have not seen) for positively preventing such accidents.

The steam pressure for such purposes is seldom over 8 pounds per square inch. If a connection is made to the lower part of the boiler where the water is and a pipe is led from this point up to an elevation of about 20 feet, and then returned to the fire box, the fire would be put out by the discharge of water into it as soon as the pressure reached a point when it would raise the water over the 20-foot mark. This would be about 9 pounds. If a spraying end was placed on the pipe the quenching of the fire would be more gradual and equally efficient. If it is desired to carry a higher pressure than 8 pounds the pipe must be carried to a corresponding higher point. The chief objection to the plan is that the discharge of water into a fire pot might make a dirty mess around the boiler or might possibly crack some casting, but inasmuch as the apparatus would only act when both the damper regulator and safety valve were out of order or not working, the objections above do not seem of much importance. It would positively prevent an explosion. There is also made a pop safety valve which has over it a whistle, which, if set at any pressure, will give an alarm if this pressure is exceeded. It works well and will wake up the whole household (and all the neighbors, too) if the boiler attendant has gone away and left the draft door open and the pressure gets too high. I bought one to put in my own house and speak from experience.

Regarding Furnaces.

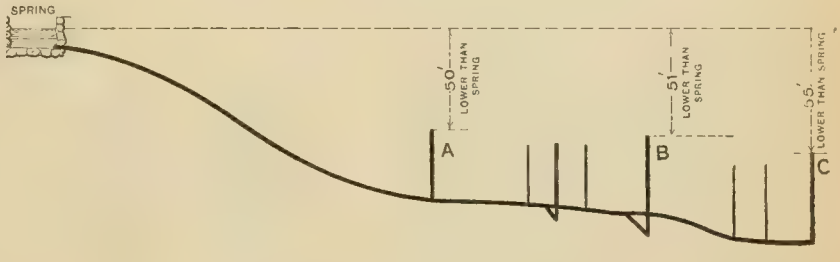
From S. T., *Boston.*—Jack Frost will soon show that he is working in the interest of the fuel dealer, and in order that the house owner may have some chance and not pay out all of his spare cash for fuel, it behooves him to have his furnace put in order before the white frost turns the leaves black. It is a good plan to take out all of the heating pipes and register boxes and give them a thorough cleaning, as the dust that is liable to collect inside may cause a bad odor when hot air is brought in contact with it. The furnace itself is liable to be covered with dust, and when a fire is started this dust is liable to burn or roast and give to the air a "stuffy" odor that is very unpleasant. By removing the dust from the furnace this disagreeable feature is obviated. The smoke pipe also demands careful attention, for if it is partly filled with soot or ashes the draft will be greatly impaired. While the furnace may show a disposition to draw in a sufficient amount of air for active business, the products of combustion may not have an opportunity to escape with sufficient rapidity. This will prevent the fuel from giving off the proper amount of heat. When a furnace is first put in it is supposed that all joints are properly cemented and gas tight. The unequal expansion and contraction of parts may cause the cement to crumble or crack so as not to properly retain the gases. A remedy is easy to suggest: the joints should be made tight by the application of fresh cement. A weak point in many furnaces is where the smoke pipe joins the radiator. The smoke-pipe collar is usually quite short, and if the furnace is set in brick the furnace may have settled unequally so as to loosen this joint, however perfect it may have been at first. The burning out of cement or warping of castings in a portable furnace may cause a loose joint through which gas or smoke may pass.

A furnace may be provided with a cold air pit, and while this may be a very proper way of setting, if surface water collects in the pit and, perhaps, in the cold-air duct, the water may become stagnant and cause unwholesome odors to pervade the house. If by any means some living creature should get into the cold-air pit, box or duct, and should there lose its life the unpleasant result to the atmosphere of the house is readily imagined. It is rather difficult to properly clean the interior of a furnace, especially when soft coal is used for fuel. When hard coal is used there is usually a coating of dust that forms on the inside of a furnace. To remove this scale it is only necessary to build a brisk fire, open the direct damper and then throw in some sheet zinc. The gas generated by the combustion of the zinc is of such a nature as to cause the scale to fall off. If there is an evaporating pan of any kind used in the furnace it should be kept clean. Supposing the furnace and connecting pipes to be in good order, it may be well to pay some attention to the house. If the fresh-air supply is obtained through a cold-air box or duct, there should be some means of exit for the foul air. For this purpose a fire place or other opening can be used when there is no system of ventilation employed.

Piping Water From Spring.

From F. B. L., *Saxton's River, Vt.*—We are having trouble with some water pipes that lead from a spring, and would like the opinion of *The Metal Worker* and its readers as to the cause. The water comes from the spring through a 1-inch main, and all of the branches are ½-inch pipes that lead to cisterns where the water runs all the time through a $\frac{1}{16}$-inch opening without any faucets. The upper half of the main is lead pipe and lower half cement pipe. Water runs well from all pipes which discharge on the lower floor, but fails at B and C, shown in the sketch, which run to the attic. Sometimes water has run well at all places. The outlet A is 50 feet lower than the spring, but is 1 foot higher than outlet B, which has a vertical rise of 25 feet. At C the outlet is 55 feet lower than the spring, and has a vertical rise of 30 feet. There is plenty of water in the spring. We are having difficulty in locating the trouble. Some contend a leak makes the trouble, others think it is a stoppage. It runs well at A, which is the highest point on the line. Could it run at A if there was a leak at or near the lower end in preference to the vertical outlets B and C, which are 1 and 5 feet lower than the outlet?

Note.—From the character of the pipe used in a portion of the main, bad joints or breaks might result from settling, when leaks would affect the supply or permit the entrance of something that would obstruct. The many rises and falls that would naturally occur in such a pipe are similar to traps, and if air collected in any or several of them more or less resistance would be met by the supply pressure. The fact that all has at some time worked well leaves no doubt but there has been some change in the conditions, which, however, may prove troublesome to detect. We would like to hear from our readers on this matter.



Piping Water from Spring.

Improved Furnace Top.

From A. W. GLESSNER, *Chicago.*—In your issue of September 9 I notice a communication from A. L. Burtis of Lockport, N. Y., with reference to an improved furnace top, concerning which I beg to call your attention to the fact that the Excelsior Steel Furnace Company of Chicago manufacture a very extensive line of furnace tops or bonnets, including among other bonnets the one shown in cut in connection with the article referred to, with the exception that the entire bonnet is made of galvanized iron. One objection, and a serious one in my opinion, to the style of furnace top shown in cut is the fact that the cast-iron frame would be a serious drawback in cutting of collar in side of bonnet. In almost every furnace job it is impossible to tell exactly where collars are to be cut in until the mechanic is on the job, and it is often

necessary to cut in collars close together, and with the cast-iron frame or any other kind of a frame it would be impossible in many cases to cut the collar in the right place. A collar would be just as apt to strike the middle of one of the ribs of the frame as to come between the ribs. I agree with Mr. Burtis that an improvement in the furnace business is being effected by improved furnace fittings made by machinery, and machine-made bonnets are also a very great improvement over the ordinary shop-made bonnets, and in a very great number of cases the shape and style of a bonnet have very much to do with the heating of a job.

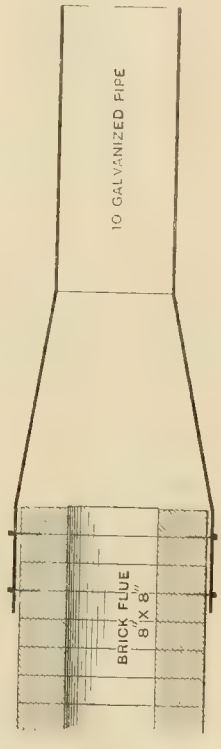
Area of Roofs.

From H. F. N., *Frankford, Pa.*—I wish to thank you for the article in *The Metal Worker* of September 9 in answer to my queries regarding the area of roofs. I understand the principle that you set forth, but its application is still beyond me. You said: "To determine under which division two sets of figures come when multiplied together, it is only necessary to add the indices—thus $1^\circ \times 1' = 1'$." I read that 1 foot multiplied by 1 inch or prime is equal to 1 inch, or prime, which conveys no meaning to my mind. Again $2' \times 9' = 18''$. I would expect that the $18''$ would be $18'$, or the same as the multiplier and the multiplicand. Finally, what is the meaning of $66^\circ\ 2'\ 6''$ in your answer? Is the $6''$ to be read as $\frac{6}{12}$? These points made clear will confer a great benefit upon me, as I have no doubt that your idea will just suit me.

Answer.—We think we can easily clear up our correspondent's difficulty. The prime marks are 12ths and the second marks are 12ths of the primes, or 144ths of the feet. Hence $1^\circ \times 1' = 1'$ or $\frac{1}{12}$ of a square foot. $2' \times 9' = \frac{18}{144}$ of a square foot. Our correspondent will understand that the primes stand for inches and if instead of multiplying them together as primes he will consider them as fractions of a foot he would have have $\frac{2}{12} \times \frac{9}{12} = \frac{18}{144}$, the same answer as given above. Our correspondent will perhaps better understand this matter of the multiplication of two quantities giving a smaller quantity if he will consider them as fractions. $\frac{1}{2} \times \frac{1}{2}$, for instance, is $\frac{1}{4}$. Proper fractions reduce themselves as they are multiplied together.

Some Ideas on Chimneys.

From CÆSAR, *Louisville, Ky.*—My methods of testing a flue are governed by certain rules that are arbitrary, and if they are not properly understood the operator will be in the dark the greater part of his time. The knowledge of chimneys is acquired only by long years of observation and experience. It is a difficult matter, however, to write up this subject intelligently, for circumstances do and will govern all cases, and the operator must be governed by them. In testing a flue I first remove the smoke pipe from bottom of flue and fill the flue with paper and burn it. This will give the average strength of the flue. Next observe the surroundings of top of flue. A flue may be ever so good and still its usefulness be destroyed by an overhanging tree or overtopped by the comb of roof or adjacent buildings. If the latter trouble is present it must be remedied by extending the top of flue upward until it rises above all obstructions. In nine cases out of ten flues are rendered useless by the manner in which they are topped out, as it is wrong to taper the pipe with the small end on the top. There is not one grain of common sense in this method of raising a flue. If a flue must be raised to work properly it should be done as shown in the sketch. For instance, if there is an 8-inch square flue, the addition must be at least 25 per cent. larger and extend high enough to correct the flue to which it is attached. There is no room for an argument on this question, for it will prove itself every time it is tried by giving perfect satisfaction. If the flue is flat it must be corrected by a reservoir at the bottom of flue.



Some Ideas On Chimneys.

Another point is this: the operator must be governed by the amount of work expected from the flue. For instance, the same result must not be expected from a furnace as would be secured from a stove. Supposing there is a flue 6 x 6, inside measure, which has worked all right with a stove attached, but must be used for furnace; what must be done if it cannot be torn down and rebuilt? It can be increased in capacity by velocity from 50 to 100 per cent. by compelling the heated air and gases that travel 1 foot within a given time to travel 2 feet within the same time. I know that I will raise a storm about my ears by the following: I have no patience with the theory of ascending and descending currents of air in a flue at the same time. My experience is that when there is a descending current in a flue there will be smoke in the house. To work a flue properly a vacuum must be created within the flue and this vacuum must be filled by the air and gases that are forced directly through the fire, and it must have no other openings between outlet collar on furnace and top of the flue. Flues that had sufficient area and hight have often proved worthless, but by using a weight and rope as many as six brick have been driven out of them that had been dropped by the builder and lodged in such a way as to leave a partial draft. The best shaped weight is obtained by using an ale bottle as a pattern, with a ring cast in the neck.

Steam Coil in Water Tank.

From L. W. F., *Massena, N. Y.*—Will you please describe in *The Metal Worker* the proper way to pipe a vat that is built up over the boiler for the purpose of heating water for a bath-house in the quickest way with the least fuel? The vat is 5 feet square and 2½ feet deep. It is now piped with 1-inch pipe in pieces 4½ feet long, and screwed together with fittings in cob-house fashion. The steam is taken from the dome of the boiler to the top of the coil, which has a gradual decline to the bottom, where a hole is made in the tank for a pipe to take the condensation back to the boiler at the lowest point, using a check valve about 3 feet from the boiler. The vat has a cover, yet it takes two hours to heat the water to 90°. I would like some light on the subject.

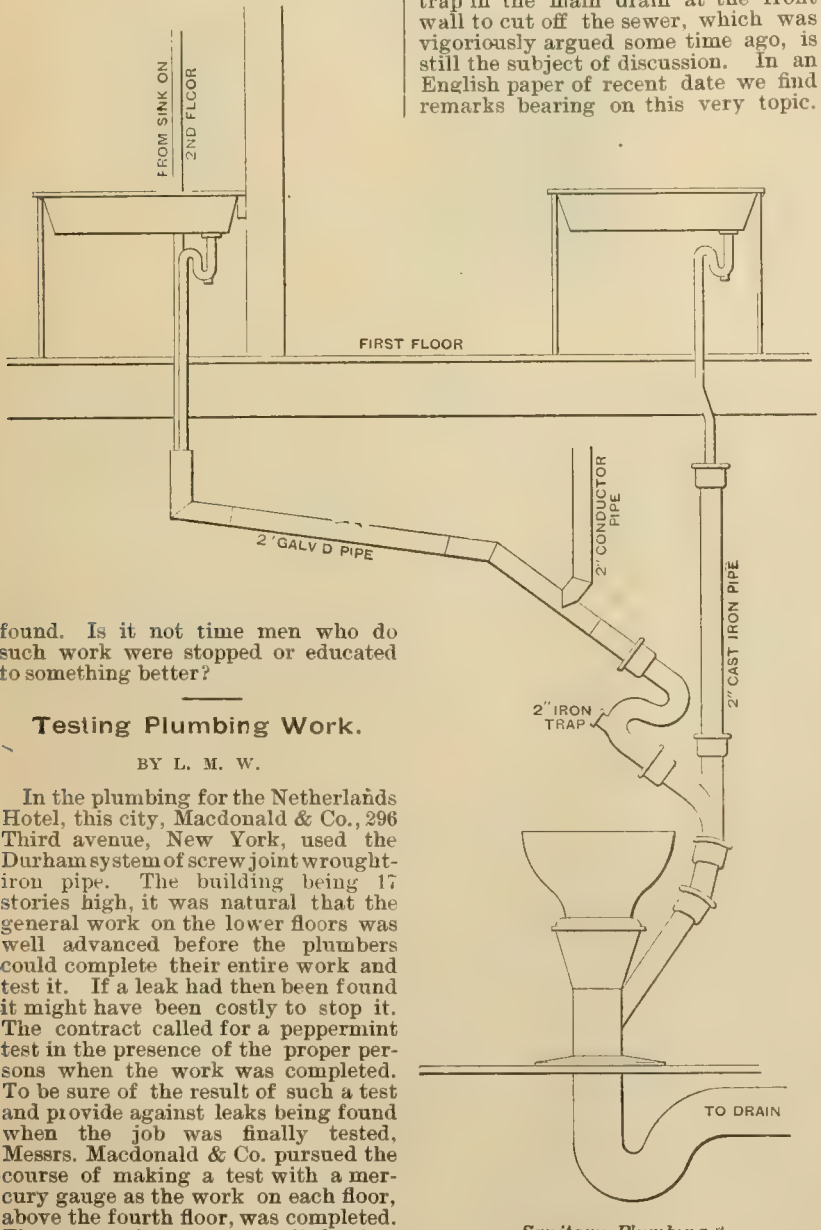
Note.—Some of our readers may be able to answer this question from the light of personal experience. It would be necessary, to give a correct answer, to know the pressure of steam. If the steam used is from a power boiler the exhaust could be utilized, and would probably be as cheap a way of heating the water as any. The number of feet of pipe that has been used in making the coil should also be known. It is generally believed that a coil running back and forth across the bottom of a tank is most effective. Some men of excellent practical experience prefer to use a large size of pipe in coils for heating water. The information given leads to the belief that an insufficient amount of heating surface is exposed in this case. By calculation this tank is found to hold about 470 gallons, and as some experienced men use 1 lineal foot of heating coil for every 3 gallons of water, there should be, according to their rule, about 155 feet of 1-inch pipe with a steam pressure under 50 pounds. If there is a high pressure of steam of 100 pounds or over 1 lineal foot of coil to 5 gallons of water might be satisfactory. Our correspondent can easily tell how many feet of pipe he has put in the coil and can calculate what change in surface is necessary to meet his requirements. In *The Metal Worker* of April 22, 1893, is an article on this subject, which discusses it exhaustively, that will be of interest.

Mr. Livesey of the South Metropolitan Gas Company, London, in an interview published in the *Daily Graphic* of that city, mentioned an instance of the obtuseness of domestics in the management of gas cooking stoves in the following experience: A gentleman had a new cooking stove fitted in his kitchen. The fitter from the gas company duly set it up and explained the working to the cook, lighting, at her request, every one of the burners. He then left. The end of the quarter duly came, and the meter inspector reported an abnormal consumption at this particular house. The company immediately sent down to inquire the cause, wishing to anticipate the indignant remonstrances of the owner of the house. Will it be believed the genius of a cook had never turned off a single burner, and that the stove had been incontinently consuming endless thousands of gas, day and night, for the full period of three months!

PLUMBING and GAS FITTING.

Sanitary Plumbing?

From H. W. S., *Portland, Maine.*—Inclosed is a sketch of some work that came under my observation as inspector of plumbing. The owner of the building proposed to make some changes and I was called to see what changes would be necessary to comply with the law, and this sketch shows what I found. Is it not time men who do such work were stopped or educated to something better?



Sanitary Plumbing?

Testing Plumbing Work.

BY L. M. W.

In the plumbing for the Netherlands Hotel, this city, Macdonald & Co., 296 Third avenue, New York, used the Durham system of screw joint wrought-iron pipe. The building being 17 stories high, it was natural that the general work on the lower floors was well advanced before the plumbers could complete their entire work and test it. If a leak had then been found it might have been costly to stop it. The contract called for a peppermint test in the presence of the proper persons when the work was completed. To be sure of the result of such a test and provide against leaks being found when the job was finally tested, Messrs. Macdonald & Co. pursued the course of making a test with a mercury gauge as the work on each floor, above the fourth floor, was completed. The peppermint test was applied, when the work was ready for it, in the presence of a number of persons interested in the result and failed to disclose a single defect. In so large a job it is hardly probable that such an experience could result unless some similar course was followed. In the applications of the tests made as the work progressed every opening was sealed. Then the mercury gauge was connected and the pressure applied to test the joints, when the mercury was raised in the tube to a point where it stood without variation for 15 minutes or more before the work was continued. After such precaution it is not strange that when the pipes were treated to a dose of hot water, strongly impregnated with the oil of peppermint, not a trace of its pungent odor could be found in the building.

TRAPS AND VENTS.

THE OLD DISCUSSION concerning the advisability of introducing a running trap in the main drain at the front wall to cut off the sewer, which was vigoriously argued some time ago, is still the subject of discussion. In an English paper of recent date we find remarks bearing on this very topic. Under the title of "intercepting traps" they are spoken of by T. de Croucy Meade, engineer to the Hornsey Local Board, in a report recently presented. His conclusions are as follows: Looking at this question from a purely official point of view, one might perhaps be tempted to favor the discontinuance of intercepting traps for the purpose of assisting the ventilation of the public sewers; but, from experience gained after years of careful investigation of sewer ventilation and drainage, I feel that I cannot advise a course which I consider fraught with danger to the inhabitants, more especially to those who occupy small class property, where the fittings are generally of a cheap and unreliable description. In districts of a semi-rural character, where there is plenty of open space surrounding each dwelling, and where all drains are kept outside the external walls, the danger of converting house drains into sewer ventilators may be lessened if special care is taken in fixing the ventilating pipe and maintaining it in an air-tight condition.

SOME exceptionally fine specimens of plumbing work are reported to be on exhibition at the National Workman's Exhibition of British Skilled Industries, now being held at Islington, London, under the auspices of the London Trades' Council.

A CIRCULAR is issued illustrating and describing the Dandy back-air vent or waste-pipe fitting made by Thomas Hyde, Albany, N. Y., for whom Fred Adee & Co., New York, are agents. These fittings are made 2, 3 and 4 inches.

THE BOARD OF HEALTH of Jacksonville, Fla., are sending the plumbing inspectors on a house to house examination of the plumbing and piping throughout the city. Five days' notice are given the owner in cases where the work is defective, when, if it is not remedied, the city makes the necessary changes. The board reports the health of the city good, without a case of contagious or infectious disease within the corporate limits. The disposition of the different States to enact laws to provide better sanitary supervision and to prevent the incompetent from doing work that has so vital an influence on the public health is commendable, from whatever source it may have come. The plumbers are open to some congratulation that as a rule they have lent their aid in bringing about this change.

AT THE LAST MONTHLY MEETING of the Green Bay, Wis., Board of Health, Plumbing Inspector H. F. Spencer reported a large increase in the users of water and that more attention was paid to providing proper drainage than ever before. The sanitary condition of the city was excellent, but one case of contagious disease being reported. The sanitary precaution arising from a fear of cholera extended far beyond the sea coast and the good effect of attention to such matters is being felt all over the country and to the furthest West.

THE PLUMBERS' UNION of Troy, N. Y., at their last meeting passed a vote of thanks to the Ross Valve Company for the handsome bamboo walking stick with a nickel-plated head representing one of their patent valves which was presented to the members on Labor Day.

INSPECTOR OF PLUMBING CHAMBERLAIN of Lynn, Mass., is finding some "skin" work in that city, and if the practice is continued there is a probability that some licenses will be revoked. Protests have been entered with the Board of Health by the plumbers and drain layers, but in every case the inspector has substantiated his charges in the interests of the citizens and good plumbing. Such

a course is likely to remove many disagreeable competitors from the field and through force of the law some men will be forced to acquire the information to do their work properly that they would never obtain from their own ambition.

IN FUTURE all who intend to go into the plumbing business in Worcester, Mass., whether as masters or journeymen, will have to submit to the provisions of the new plumbing law as administered by the board appointed. The chairman of the board is Charles H. Peck, inspector of public buildings; Dr. L. F. Woodward, chairman of the Board of Health, and John T. McCartney, inspector of plumbing, who is clerk of the board.

CERTIFICATES WERE GRANTED by the Plumbing Board of Watertown, N. Y., to E. B. Irvin and Chas. J. Dean for competency as employing plumbers, and to W. T. Norris for competency to lay sewers.

CHAS. TUCKER, 45 East Eleventh street, New York, has bought a Curtis & Curtis 6-inch pipe cutting and threading machine, and is equipped to do plumbing by the system of screw-joint iron pipe.

EDMOND L. GRUNDY, 18 Cottage street, Melrose, Mass., has been appointed inspector of plumbing for that city. He is a practical plumber with many years' experience in the city of Boston and is well qualified for the work.

THE BOARD OF HEALTH of Natick, Mass., have appointed Phillip J. Kenneally inspector of plumbing.

JAMES KILGOUR, West Springfield, Mass., has moved out on Madison avenue with his plumbing establishment.

THE NASHUA, N. H., Y. M. C. A. Gymnasium is to have bathrooms, and the plumbers are engaged in fitting them up.

A DEADLOCK between the Common Council and the Board of Health of Providence, R. I., delays the election of an inspector of plumbing at a salary of $1500 a year.

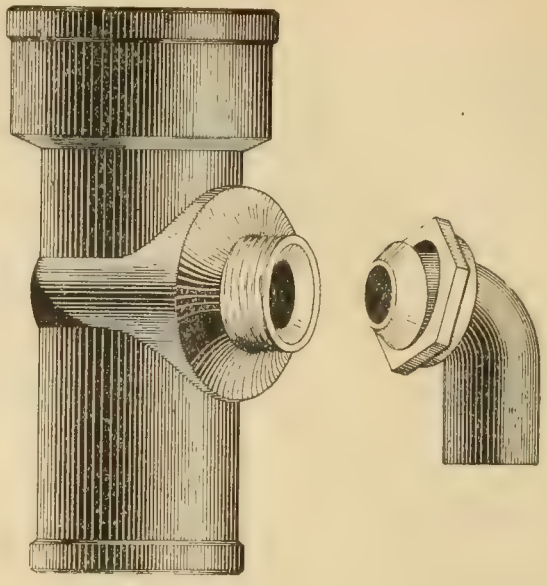
AT A MEETING called for further consideration of the plumbing and machinery for the Buckner's Orphans' Home, Dallas, Texas, D. J. Kavanaugh was elected chairman and H. H. Jones secretary of the Plumbing and Steam Heating Committee; specifications were then drawn up by the plumbers for the plumbing material needed. This committee reported to the general committee and the work has been commenced.

THE REQUEST of the Board of Health of Seattle, Wash., for the Mayor to veto the ordinance to do away with one of the sanitary inspectors calls out some comments on the enforcement of the law requiring inspection of plumbing and licensing of plumbers from M. W. Seymour. He says the law has never been enforced, and that about one-third of the shops in the city are doing plumbing without a license; that these plumbers are threatened by the inspectors, who also threaten the owners of buildings who employ them, but nothing but threatening is done. He thinks that if it is the sole duty of the inspectors to threaten, and there is no power behind them to enforce the law, there might as well be no inspectors.

DANIEL H. STREEPER, Norristown, Pa., has secured a patent on a device for thawing out frozen pipes. The invention consists of a boiler connected with a pump for supplying water to be heated and an outlet pipe through which hot water or steam from the boiler is forced by the action of the pump.

The Dandy Back-Air Vent.

The accompanying illustration shows the Dandy back-air vent or waste-pipe fitting, made by Thomas Hyde, 69 Perry street, Albany, N. Y. The illustration presented shows the fitting



The Dandy Back-Air Vent.

apart. One object of this fitting is to furnish the plumber with a simple means for connecting up a back-air vent, and it furthermore provides for ascertaining whether there is any stoppage in the vent, as it permits the back-air pipe to be disconnected at any time and replaced with little trouble. The couplings are ground into their seats so as to require no gasket, and the T being of the sanitary T form, the flow of air is not impeded by the friction of a square angle, nor can the scale from the iron or other substances fall into the branch pipe leading from the fixture. Couplings of any angle are furnished and they are made 2, 3 and 4 inches in size.

Patent and Trade-Mark Congress.

The World's Congress Auxiliary announces an unusually strong and interesting programme for its Patent and Trade-Mark Congress, to be held the first week in October. The influences which encourage or discourage progress are to be considered by able representatives of various countries, particularly England, Germany, Belgium, France, Sweden, Austro Hungary, Holland, Switzerland, Japan, Canada, Mexico and the United States.

It is expected that Hon. Henry W. Blodgett—for more than 20 years judge of the United States Courts at Chicago, and recently counsel for the United States in the Behring Sea arbitration—will be made permanent president of the Congress, and that representatives of the Association of American Inventors and Manufacturers and of the United States Trade-Mark Association will be made vice-presidents. It is also expected that Hon. Hoke Smith, Secretary of the Interior—the department of our Government from which patents are issued—and Hon. John W. Noble, Ex-Secretary of the Interior, will participate in the proceedings. Among other interesting features will be addresses from Hon. Richard Pope, Canadian Commissioner of Patents; Hon. John S. Seymour, United States Commissioner of Patents and several ex-commissioners; Hon. William F. Draper and Hon. Elijah A. Morse, members of Congress from Massachusetts; Hon. James Buchanan, ex-member of Congress from New Jersey; Hon. Carroll D. Wright, United States Commissioner of Labor; Dr. R J Gatling, president Association of American Inventors and Manufacturers; Francis Forbes, secretary United States Trade-Mark Association; Dr. C. Matzudaira, Imperial Japanese Commissioner to the World's Columbian Exposition; Carl Pieper of Germany; W. Lloyd Wise and Miss Ellen Blackburn of England; Dr. Snyder de Wissenkerke of Holland; John Bernstrom of Sweden; C. O. Paget of Austro-Hungary, and Judge Sepulveda of Mexico.

Although the programme is not yet finally made up, a large number of the papers or addresses are definitely promised. Ephraim Panning of 225 Dearborn street, Chicago, is chairman of the Committee on Organization.

At the inauguration of the new steamship services between Newport News and England on September 8, President M. E. Ingalls of the Chesapeake & Ohio Railroad, in the course of a speech at the banquet given at Newport News to the company's guests, referred to the opening of the line as a notable event in the commercial history of the country. The meats and grain and cotton and tobacco of the Ohio and Mississippi valleys, he observed, can now be carried out through the port of Newport News and by the new steamship line to all parts of Europe cheaper and quicker than through any other port on the continent. The opening of this line of steamships marks a new era in the commerce of this country. The merchant of Cincinnati, St. Louis and Chicago can to-day have his through bill of lading for goods for London and Liverpool given him direct by this line, and he can make his importations through this port. The first steamship of the line—the "Rappahannock"—sailed for Liverpool last week, and the six vessels belonging to the company will keep up a weekly service. The steamers are 370 feet in length and 44 feet in breadth, with a cargo capacity of 6000 tons, and contain fittings for 770 head of cattle.

THE METAL WORKER SKYLIGHT COMPETITION.

First Prize Essay.

By Henry M. Sanders.

PLATE 1.—GROUND PLAN AND ELEVATION OF SKYLIGHT.

Fig. 1 is the ground plan and Fig. 2 is the elevation of skylight, the skylight being 4 feet wide and 6 feet long. The bars on all four sides are placed 12 inches on centers. As in the construction herein set forth, the measurement of bars is on the curb line.

A represents the curb, B the hip bar, C, D, E and F the various side bars, which have the same form or shape, with the same miter at the curb, but with different miter developments at the top of bar. While all of these various bars C, D, E and F require miters at top and bottom, or curb, and as the curb miter is the same in all cases, we have only developed the curb miter for the bar C, on Plate V. Hence on those plates where we have developed miters for D, E and F we have only developed the top miter.

To obtain the length of hip bar *c b* draw the line *b k* at right angles with *b c* and make *b o* equal in length to hight of skylight, as shown by *f g* in elevation, Fig. 2. Draw lines from *c* to *o* and we have the length of hip bar B required, or, in this case, 36¾ inches. At point *e* on line *c b* draw dotted lines at right angles with *c b*, intersecting the line *c o* at *s*, or 18⅜ inches as the distance from bottom line of measurement of hip bar B to intersecting point at top of side bar E. The lengths of side bars C, D and F are all the same and as shown by *f h*, or 27¾ inches, in Fig. 2. The hight of skylight, as represented by *f g* in Fig. 2, is 13⅞ inches. The length of ridge bar G is 24 inches and the length of side bar E, as shown by *h m* in elevation, Fig. 2, is 13⅞ inches.

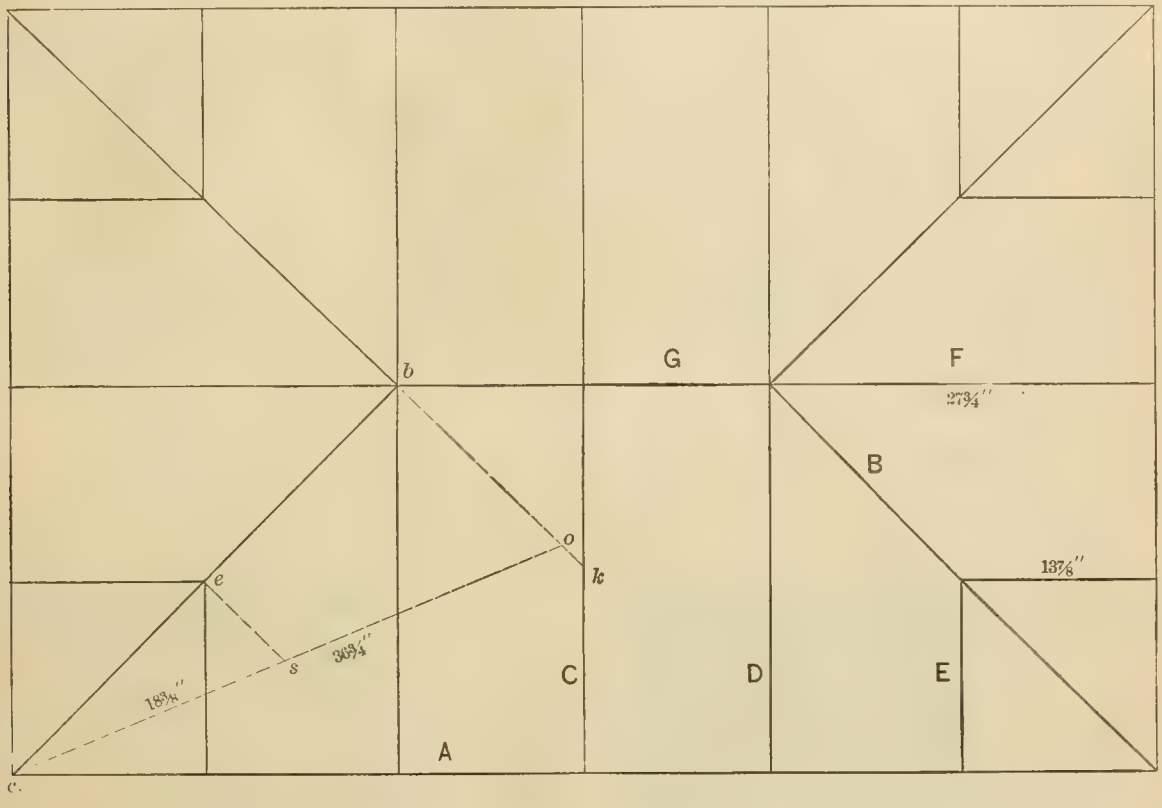


Fig. 1

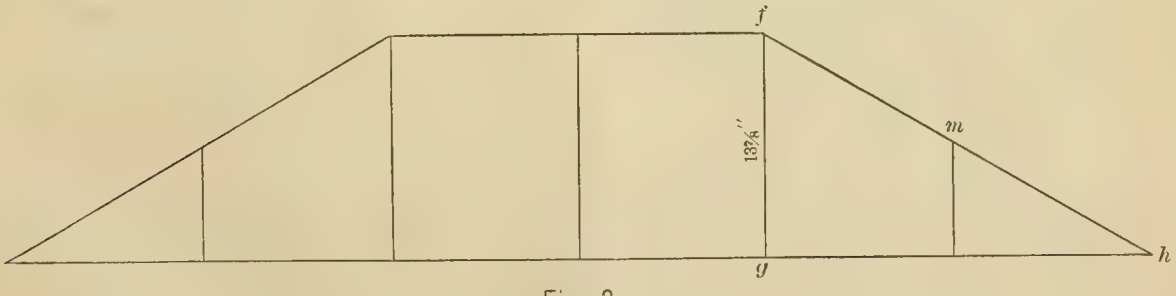


Fig. 2

PLATE I.—GROUND PLAN AND ELEVATION OF SKYLIGHT.—(SCALE, 1 INCH TO A FOOT.)

In cutting the glass for the skylight, cut it enough smaller than the space in the frame it is to occupy so as to allow about ⅛ inch space all around the glass.

In the development of miters as herein set forth I have applied a principle of development that it is believed will apply alike to any other form of bar or curb and to any other given pitch of skylight. While there is a great variety of bars and curbs in use, the ones I have selected for the development of patterns, being without curves, make less confusion of intersecting lines, and, being made with sharp angles, the bars are easily made on most machines and brakes used by skylight and cornice makers.

The size of bar I have given I have found of sufficient

strength to meet all the requirements of a skylight 4 x 6 feet, or of a similar size, on the pitch given. But as the skylight is increased materially in size we must also increase the size of bar and curb to suit the best construction. Very large skylights must have not only the bars increased in size but a core plate inside of them to secure the proper strength and stiffness to the bar. Also a cap over the gutter of bar, as shown by *c c* in section of bar, Fig. 5, Plate II.

But in the size of bar I have used for a 4 x 6 foot skylight the use of the cap plate *c c* is not considered necessary, as the bar can be made sufficiently strong by being

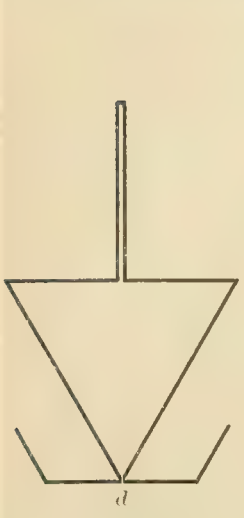


Fig. 1

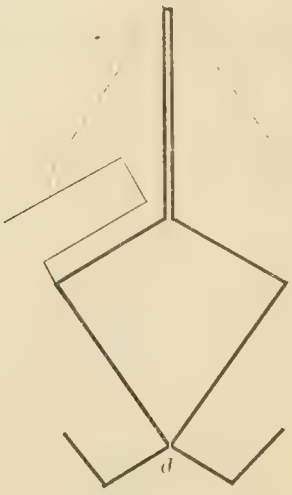


Fig. 2

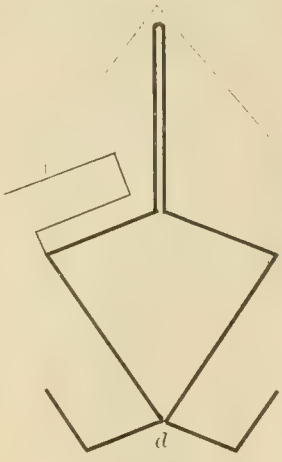


Fig. 3

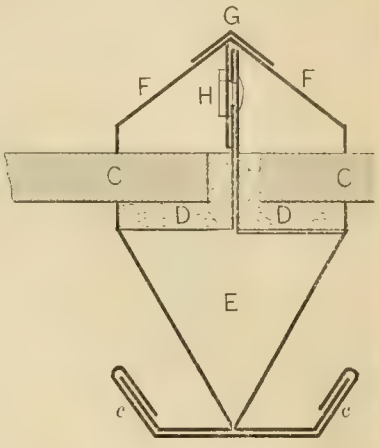


Fig. 5

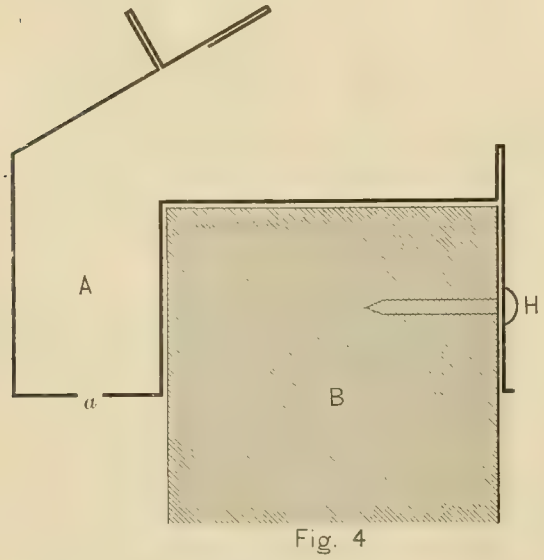


Fig. 4

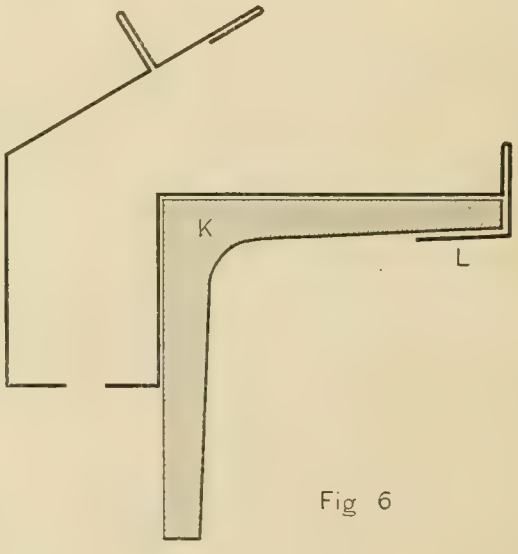


Fig 6

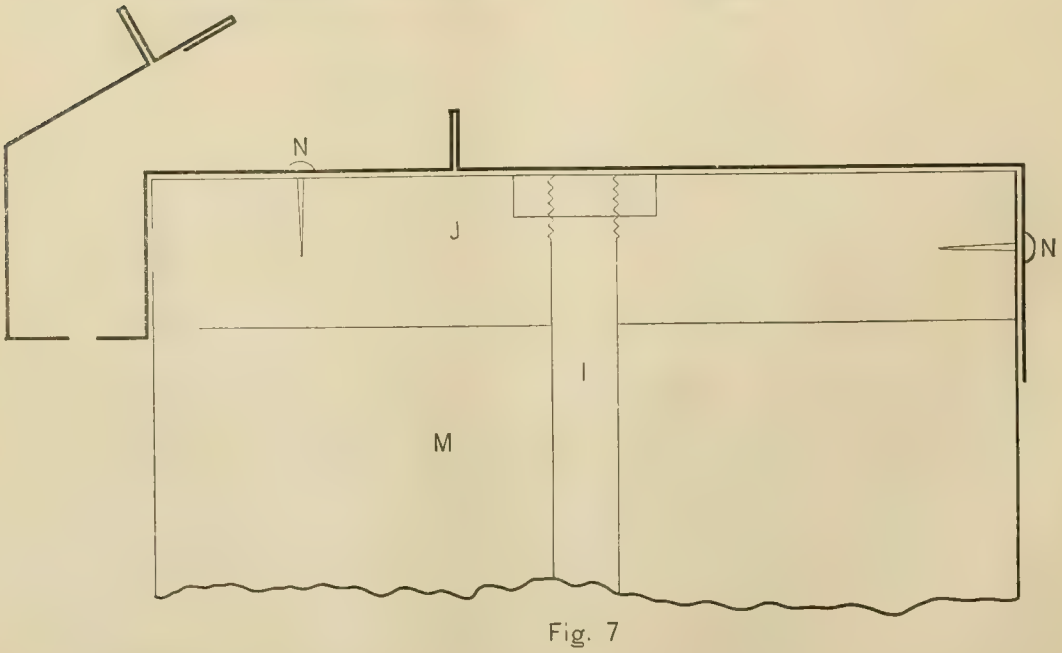


Fig. 7

PLATE II.—SECTIONAL VIEWS OF AND CURB.—(FULL SIZE.)

soldered at the point *d*, where the two sides of the bar come together, as shown in Figs. 1, 2 and 3 on Plate II.

PLATE II.—SECTIONAL VIEWS, FULL SIZE, OF THE CURB AND BARS USED.

On this plate we have represented the full-size section of the various parts we have adopted in the construction of a skylight of this size and character. Fig. 1 represents th side bars as shown on Plate I, Fig. 1, by C, D, E and F. Fig. 2, on this plate, is the ridge bar, Fig. 3 the hip bar and Fig. 4 the curb. B, in Fig. 4, is the full-size section of wooden curb, on which the skylight is presumed to set, and A, in Fig. 4, is the iron curb or base of skylight, which

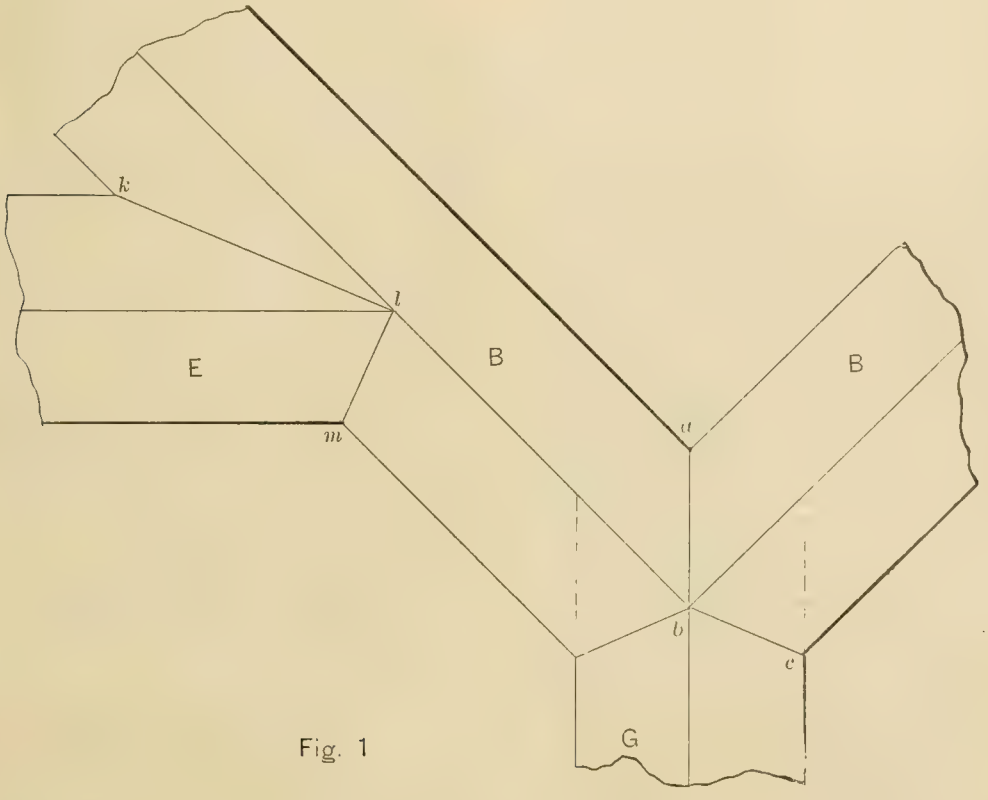


Fig. 1

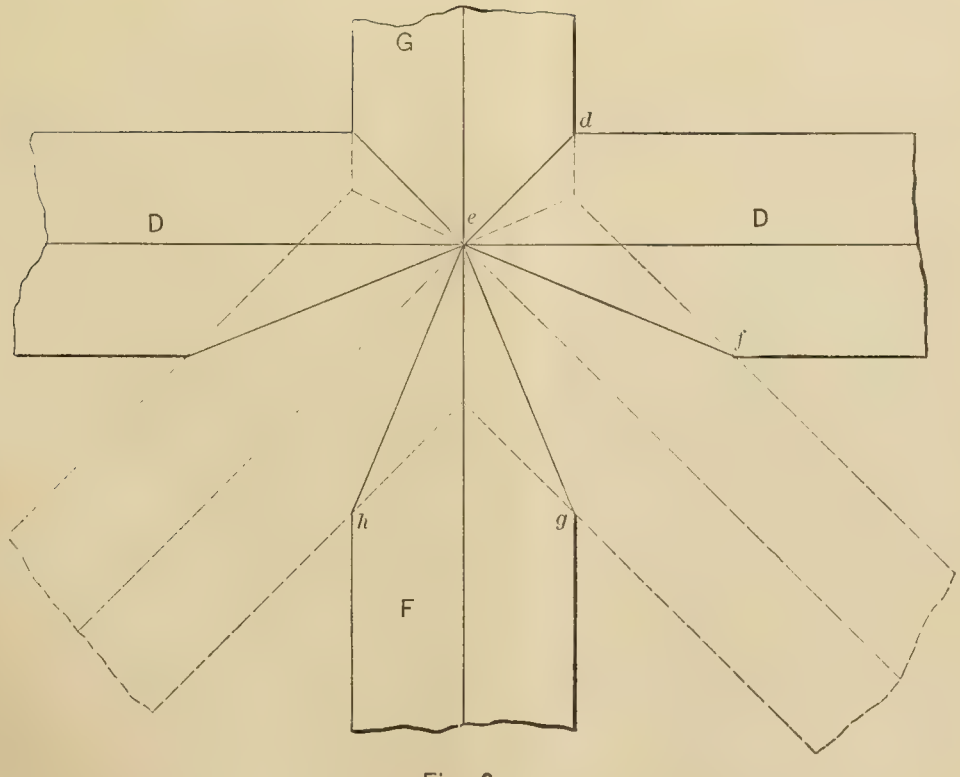


Fig. 2

PLATE III.—PLAN OF MITERS AT TOP OF BARS.—(FULL SIZE.)

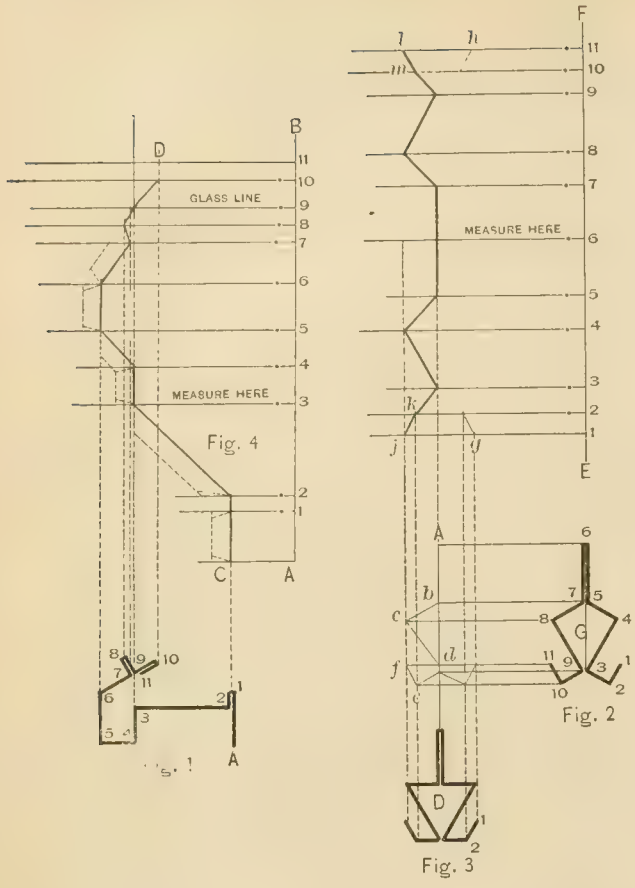


PLATE IV.—DEVELOPMENT OF CURB AND RIDGE MITERS.—
(ONE-FOURTH SIZE.)

turns down on the inside of wooden curb and is nailed to same at point H, thus avoiding the necessity of any nailing on the outside of curb.

At point *a* in bottom of gutter in metal curb A make a perforation of holes ¼ inch in diameter placed at intervals of about 6 inches around the entire curb of skylight, for carrying off all condensation that may gather on the under side of the glass.

Fig. 5 represents sectional view, full size, of complete construction of bar when glazed. E represents the bar as shown in Fig. 1. F is the cap, C C the glass, D D the putty. G represents the cleat that holds the cap F on the glass, being riveted to bar E at point H, and is passed up through the top of the cap F. That portion that passes up through the cap is split in the center and turned down on cap as shown, half on one side and half on the other. This cleat is made of copper ¾ inch wide and placed about 3 inches from the bottom of bar. The top ends of caps are soldered where they join each other and do not require cleats at top except the bar is longer, but in the ordinary size skylight the one cleat at the bottom is generally considered, I believe, sufficient. Fig. 6 shows how the curb may be secured to an angle-iron frame. K is the angle iron and the curb is secured to the same by being turned down under the angle iron at L.

Fig. 7 shows one method of constructing the curb where it rests on top of a brick wall. M is the brick wall, I are iron rods built in the wall with nuts at top to securely fasten the board or plank J to the wall, and the metal curb is fastened to this board by means of nails, N N.

PLATE III.—PLAN OF TOP MITERS.

On this plate we have shown ground plan, full size, of the intersecting points or miters at top of the bars B, E, D and F.

In the top section, Fig. 1, we have simply shown the intersection of hip bars B B with ridge bar G; *a b c* represents the ground plan of miter desired. On this same ground plan we have shown top miter for the E bar, which is represented by *k l m*.

In the lower section, Fig. 2, the intersection of the hip bars B B with ridge bar G is represented by dotted lines, and the intersection of bars D D and F with hip bars and ridge is represented by solid lines; *d e f* shows the ground plan of miter for the bar D, and *e g h* the ground plan of the miter for the bar F.

We have made this distinction because in constructing the skylight and putting it together the hip bars B B are the first to be set in place in connection with the ridge bar G, and the bars D D and F are mitered into them.

PLATE IV.—DEVELOPMENT OF CURB AND RIDGE MITERS.

Fig. 1 represents a section of the curb or base to skylight. On line A B, which is drawn perpendicular to the base of curb, lay off the stretchout of the curb, making the distance between points A 1, 1 2, 2 3, &c., equal in length to the same points as shown in Fig. 1. That is, make A 1 in line A B equal in length between points, as between A 1 in Fig. 1, and the distance between 1 2 equal in length to the distance between corresponding numbers in Fig. 1, and thus continue the process until the full stretchout of curb is obtained and laid off on the line A B. At these various points, A, 1, 2, 3, &c., thus obtained, draw lines at right angles with A B, intersecting the same with dotted lines drawn from corresponding figures in the curb, as shown in Fig. 1. Connecting these points of intersection with lines drawn between them, we have the miter of the curb C D. In laying off the full length of pattern of curb, mark off the distance between bars, both on the side and end pattern, with a prick mark on glass line, as shown in Fig. 1, in order to show where to set the bar in putting the frame together. In this case the distance between points is 12 inches.

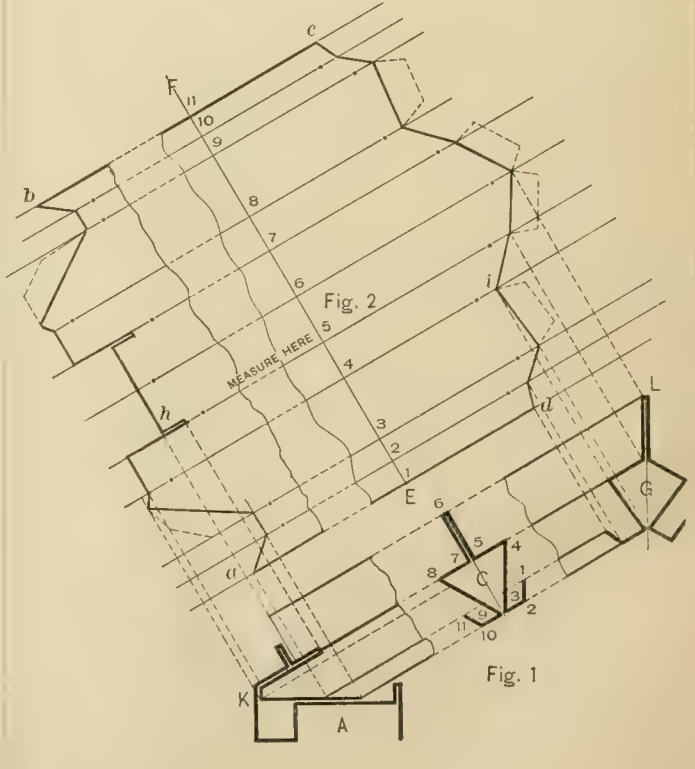


PLATE V.—PATTERN FOR SIDE BAR C.—(ONE-FOURTH SIZE.)

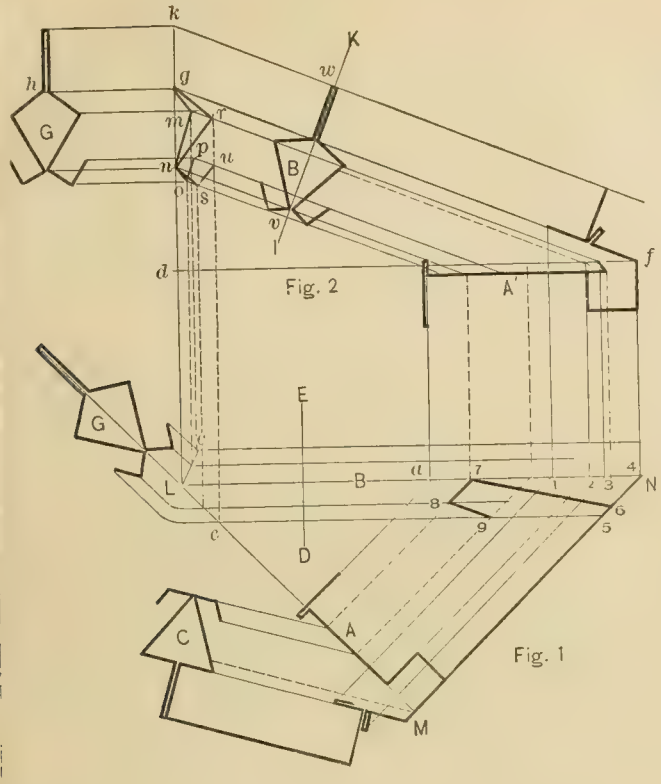


Fig. 1

and we have *a b* as the development of the miter at the curb end of the bar, and *c d* as the development of the miter of the bar at the top where it intersects with the ridge bar G.

PLATE VI.—DEVELOPMENT OF HIP BAR AND MITERS.

The development of the shape and form of the hip bar, and the intersecting points of the top and bottom miter to same.

Fig. 1 represents a portion of the skylight, showing the ground plan and intersecting points of hip bar B at top with ridge bar G, and its connection at lower end with the curb. Let the angle L M N represent one-half of the end of the skylight. On the line L M construct the curb A, with its front or gutter end resting on line M N.

With L M as the base line of curb construct the side rafter C, with its intersecting points at curb A, as already illustrated in Fig. 1, on Plate V.

At all points where the lines drawn from the angles in side bar C intersect with curb A draw lines parallel with M N, and continue them until they intersect with corresponding lines drawn from the angles of the ridge bar G. These lines thus drawn from the angles of the ridge bar, from their intersection with the hip bar B, are carried parallel with L N to their point of intersection at the curb with the lines drawn from the side bar C. Drawing lines between points, we have 1, 2, 3, 4, 5, 6, 7, 8, 9, representing one-half of the ground plan of the curb miter of the hip bar.

As Fig. 2 is to represent the elevation of the hip bar B with its intersecting points at the top with the ridge bar and at the bottom with the curb, to secure this we first lay off the angle *d f g*, corresponding with angle as shown by *b c o* in Fig. 1, Plate 1.

On the base line *d f*, of this angle *d f g*, which is drawn parallel with L N in Fig. 1, we construct the curb A', which gives us the elevation of the curb on the miter line.

PLATE VI.—DEVELOPMENT OF HIP BAR AND MITERS.—
(ONE-FOURTH SIZE.)

Fig. 2 represents a section of the ridge bar G, showing end miter of same where it joins the hip bar B. In Fig. 4 draw the line E F, at right angles with A 6 in Fig. 2. On the line E F lay off the points 1, 2, 3, 4, &c., equal in distance between points, as between the corresponding numbers 1, 2, 3, 4, &c., in section of ridge bar G, as shown in Fig. 2, thus giving us the stretchout of the bar. At these various points draw lines at right angles with E F, and intersect them with dotted lines drawn at right angles with A 6 in Fig. 2 from points A *b c d e f* where the ridge bar intersects with hip bar B.

In this skylight, as we have the side bar D intersecting at point A with bars G and B, it is necessary to cut away that portion of the pattern in Fig. 4 as shown by dotted lines *g j k* and *h l m*, in order that that portion of the gutter of the ridge bar, as shown in section by 1 2 and 10 11, may intersect with and miter the same points in side bar D in Fig. 3.

PLATE V.—PATTERN FOR SIDE BAR C.

Fig. 1 represents the elevation of the bar C, showing its connection with curb A at the bottom and ridge bar G at the top, and all its various points of intersection with same.

Draw line E F at right angles with pitch of bar, as shown by K L in Fig. 1. On this line, E F, lay off the stretchout of the bar, as shown by the figures 1, 2, 3, &c., making the distance between 1 and 2, 2 and 3, &c., equal in length to the corresponding figures on section of bar C in Fig. 1. From these points, 1, 2, 3, &c., thus obtained on the line E F draw lines through them at right angles with E F, and of sufficient length on both sides of the line to be intersected with dotted lines drawn at right angles with K L and from intersecting points of bar C with curb A and ridge bar G in Fig. 1.

Draw lines between the intersecting points of the dotted lines with the solid lines, drawn at right angles with E F,

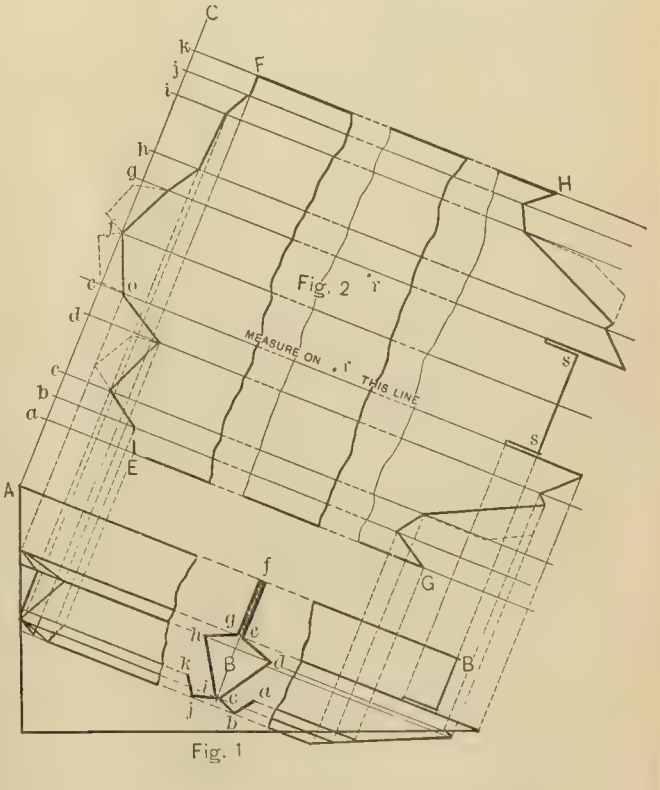


Fig. 1

PLATE VII.—PATTERN OF HIP BAR.—(ONE-FOUTRH SIZE.)

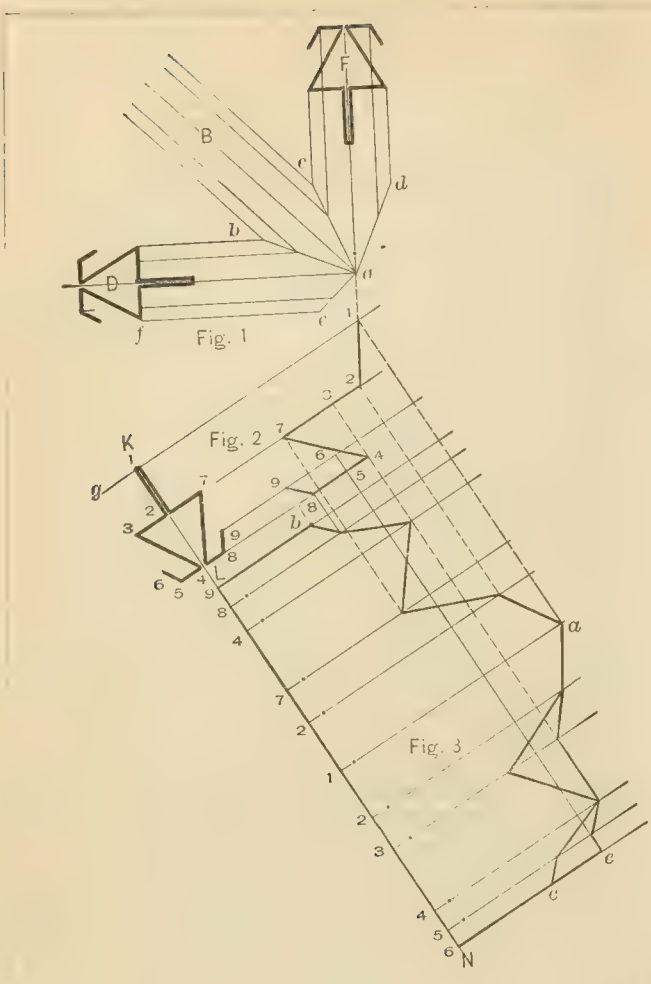


PLATE VIII.—TOP MITERS FOR D AND F BAR.—(ONE-FOURTH SIZE.)

The solid lines drawn to curb A' from miter line *a* N on L N in Fig. 1, and at right angles with the same, show points of projection of the curb. The hight of curb at its various points is the same as corresponding points in curb A of Fig. 1.

The dotted lines drawn from 1, 2, 3, 4, &c., on this same line, *a* N, and at right angles to it, and extended to curb A' in Fig. 2, give us the different points of projection of the hip bar on the curb.

In order to secure the proper points in the miter at the top of the bar B, we will first continue the line *f g* until it shall intersect with a line drawn from the point L, and at right angles with L N in Fig. 1. Then at *g*, in Fig. 2, draw the line *g h* at right angles with *g d*, and at *h* construct a section at the ridge bar G. From the various angles of this bar thus obtained draw lines parallel to *h g* and intersect them with the dotted lines drawn from the miter *c* L *e* in Fig. 1, and by connecting the points we have *k g m n o p* as the miter line in the elevation of the hip bar at the top. From these various points thus obtained draw lines parallel to *g f* to the curb, when they will intersect points already secured from corresponding angles in side bar C in Fig. 1.

This gives us all the lines in the elevation of the bar. We are now prepared to construct a section, or shape, of the hip bar. But before doing so there is another top miter to be shown in the elevation of the hip bar B, which is *k g r n s u*. This is obtained by dotted lines drawn from the ground plan of the miter, as shown by L *e* in Fig. 1 at right angles with L N and intersecting corresponding lines in the elevation of the bar in Fig. 2, and by connecting the points it gives us, as stated, the miter line *k g r n s u*.

To construct the hip bar draw I K at right angles with *f g*, the pitch of bar. V W on line I K gives us the full hight of the bar and all intermediate lines crossing the line I K gives us the hight of the bar at the various angles. The width of bar is shown at D E in Fig. 1. To construct the shape of the bar we simply make the width of the bar at the various points on line I K correspond with the width of same, as shown on lines between D E in Fig. 1, or as shown by width of ridge bar G at its various angles.

PLATE VII.—PATTERN OF HIP BAR.

Fig. 1 represents the elevation of hip bar B, showing top or ridge miter and bottom or curb miter, as already developed in Fig. 2 on Plate VI.

To secure the pattern of this bar, first draw line A C from point A in top of elevation, Fig. 1, and at right angles with A B, the pitch of the bar, and on this line lay off the stretchout of the bar.

Make the distance between points *a*, *b*, *c*, *d* and *e* on line A C in Fig. 2 correspond in length to the same distance between *a*, *b*, *c*, *d* and *e* as shown in section B on Fig. 1, and we have *a k* on line A C as the full width, or stretchout, of pattern required.

From these various points of the stretchout of the bar thus obtained draw lines at right angles with the line A C, and of sufficient length to be intersected with dotted lines drawn at right angles with A B and from points in the top and curb miter, as shown in Fig. 1.

Connecting the points thus obtained, we have E F as the developed pattern for the top or ridge miter, and G H as the development of the lower, or curb, miter pattern.

The measure for the length of the hip bar is to be taken on the glass, or curb line, as shown on pattern by *o s*, Fig. 2, and equal in distance from *c* to *o*, as shown in Fig 1, Plate 1; *r r* on pattern, Fig. 2, show points to be marked on pattern of intersection of side bar E at the top, as shown at *e* in Fig. 1 on Plate I. Hence the distance *s r* on the pattern, Fig. 2, is the same as *c s* on line *c o* in Fig. 1, Plate I.

PLATE VIII —TOP MITERS FOR D AND F BAR.

Fig. 1 shows the ground plan and Fig. 2 the elevation of the miter. Starting with the ground plan and taking *e f* as the level line, we lay off the line *i g* at convenient dis-

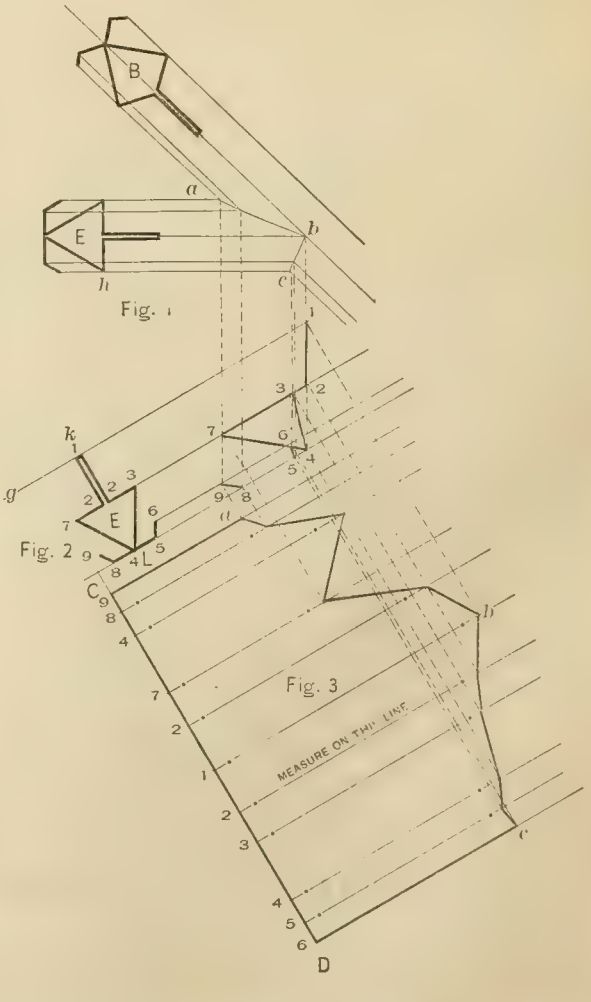


PLATE IX.—TOP MITER FOR THE E MOLD.—(ONE-FOURTH SIZE.)

tance from it and on the pitch of skylight, as shown by *f h* in Fig. 2, Plate I. Draw *k l* at right angles with *i g*. Construct the elevation of the bar D. At the various angles of the bar thus obtained draw lines parallel to *i g*, intersecting them at top with dotted lines drawn at right angles with *e f* in Fig. 1 and from points on the ground plan miter, as shown by *e a b*, said points in ground plan having been established by lines drawn from the angles in the section of bar D, in Fig. 1. Connecting the points thus obtained in Fig. 2, we have 1 2 3 4 5 6, as the form of miter in elevation of which *e a* in Fig. 1 is the ground plan, and 1 2 7 4 8 9 is the elevation of the miter of which *a b* in Fig. 1 is the ground plan. As *a c* and *a d* represent the same miter in the ground plan, as *e a*, the same elevation of the miter applies alike to all, so that the elevation of miter

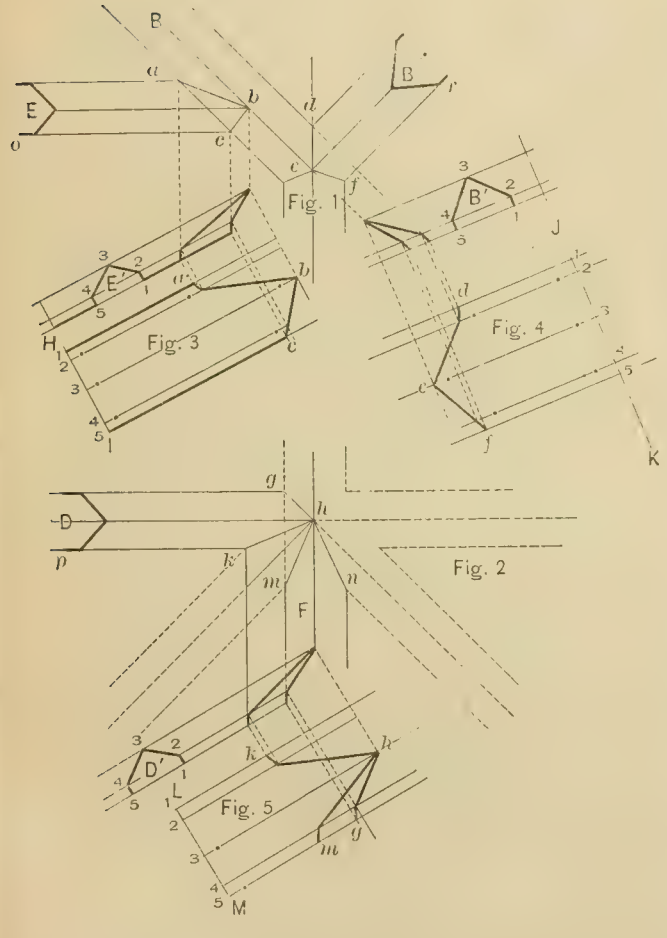


PLATE X.—DEVELOPMENT OF CAP MITERS.—(ONE-FOURTH SIZE.)

1 2 7 4 8 9, developed from the ground plan *a b*, will be the same for *a c* and *a d*.

Having procured the form of the miter in elevation we proceed to lay off the miter. Draw line L N at right angles with *i g*, and proceed to lay off the stretchout of the bar, making all distances between points 9, 8, 4, 7, &c., on line L N in Fig. 3 to correspond to distance between same points 9, 8, 4, 7, &c., as shown in section of bar D in Fig. 2. From these points on line L N, and at right angles to it, draw lines parallel with *i g* of sufficient length to intersect the dotted lines drawn at right angles to *i g* in Fig. 2, and from the points in the elevation of the miter 1, 2, 3, 4, &c., and we have *b a e* in Fig. 3 as the developed miter of the D mold, as shown in ground plan *b a e* in Fig. 1. As *a b* is the same as *a c* and *a d*, *b a c* in Fig. 3 is the developed miter for the bar F, as shown by ground plan *c a d* in Fig. 1.

Use the same curb miter for these bars D and F as already developed for bar C on Plate V.

PLATE IX.—TOP MITER FOR THE E MOLD.

In Fig. 1 we have reproduced that portion of Fig. 1 in Plate III which shows the intersection in ground plan of the bar E with the hip bar B; *a b c* on plan represents the miter. Draw lines from all the angles in bar E, and parallel with *c h*, to the miter line *a b* and *b c*, as shown. Having thus secured all of the points of intersection of the miter on the ground plan *a b c*, we proceed to develop these intersecting points of the miter in the elevation of the bar, the same as for bars D and F on Plate VIII.

With *c h* as a level line lay off the line *i g* at a convenient distance from it and on pitch of skylight, as shown by *f h* in Fig. 2 on Plate I.

At point *k* on line *i g* in Fig. 2 draw *k l* at right angles with it. On this line *k l* construct a section of the elevation of the bar. Through the various points or angles on this bar, E, draw lines parallel to the line *i g* and of sufficient length so that they can be intersected, with dotted lines drawn at right angles with *c h* in Fig. 1, said dotted lines to be drawn from the various intersecting points on the ground plan *a b c* of the miter. Connecting the points we have, in Fig. 2, 1 2 3 4 5 6 as the elevation of the miter for which *b c* in Fig. 1 is the ground plan. 1 2 7 4 8 9 is the elevation of the miter of which *a b* in Fig. 1 is the ground plan. From this elevation of the miter we proceed to lay off the pattern. Draw C D at right angles with *i g*, and on this line lay off the stretchout of the bar, making all distances between 9, 8, 4, 7, &c., on line C D in Fig. 3 to correspond in length with the same points 9, 8, 4, 7, &c., as shown in section of bar E in Fig. 2. From each of these points, 9, 8, 4, 7, &c., in Fig. 3, draw lines at right angles to C D, and of sufficient length to intersect with the dotted lines drawn at right angles with *i g* in Fig. 2 and from the various points in the elevation of the miter. Draw lines between points of intersection thus obtained and we have *a b c* in Fig. 3 as the developed pattern of the miter. The lower or curb miter of this bar is the same as that already developed for the bar C on Plate V.

PLATE X.—DEVELOPMENT OF CAP MITERS.

Development of cap miters at points of intersection at top, the lower or bottom end of cap being cut square end.

The ground plan of the caps for the various bars, as shown in Fig. 1 and Fig. 2, are the same as for the bars, being the same in width. The full size and form of the caps for the various bars are already indicated on Figs. 1, 2 and 3, Plate II. E, B, D and F in Fig. 1 and Fig. 2 give us the shape or section of cap for the various bars, as the letters indicate.

E, as shown in Fig. 1, is the cap for the E bar that intersects and miters the cap for the hip bar B at the points *a, b, c*. The method of securing the pattern of this cap is the same as that of securing the pattern of the E bar, by dropping dotted lines from this miter *a b c* at right angles with *o c*, until they intersect solid lines drawn from E', the elevation of the cap on the pitch of the skylight. This gives us points of projection of the miter in the elevation E' from which to develop the pattern of the cap. First draw the line H I at right angles with the pitch of cap E' and on this line lay off the stretchout of the cap, making the distance between points 1, 2, 3, 4, 5 on line H I equal in length to 1, 2, 3, 4, 5 on section of cap E'. From these various points and at right angles to H I draw lines of sufficient length to intersect dotted lines from points of projection of miter in the elevation, and by connecting the points we have *a b c* in Fig. 3 as the developed pattern for the cap for the E bar.

The pattern for the cap for the hip bar B is obtained in practically the same way as the cap for all the other bars, with the exception that the pitch or elevation of the cap, instead of being the same angle is as we have already shown and explained by *c o* in Fig. 1, Plate I. But the base line of the pitch or elevation of this cap is parallel with the line *f r* in ground plan B. On this angle construct the pitch or elevation of the cap B', drawing lines through the various angles of this cap parallel with the pitch of same and intersect them with dotted lines drawn at right angles with *f r* in ground plan and from points *d e f* o_f

miter. At right angles with elevation B' draw the line J K and on this line construct the stretchout of the cap, making the distances between the points 1, 2, 3, 4, 5 on this line J K the same as between corresponding points 1, 2, 3, 4, 5 in section B'. From these points draw lines at right angles to J K and intersect them with dotted lines drawn from miter points already obtained in the elevation. Connecting the points, we have *d e f* in Fig. 4 as the developed pattern.

In Fig. 2 we have the intersecting miters of the D and F cap with the hip and ridge; *g h k* is the ground plan of the miter for the D cap and *m h n* the ground plan of the miter for the F cap.

Construct the elevation of the cap D' the same as for the cap E, drawing lines through the angle of section D' in elevation and parallel with pitch or elevation, and intersect them with dotted lines drawn at right angles with *p k* in ground plan and from the intersecting points or miter *g h k*. Connecting the points, we have the projection of the miter in the elevation. We next draw the line L M at right angles with the pitch of cap D', and on this line lay off the stretchout of the cap, as shown by 1, 2, 3, 4, 5 in section of D', making 1, 2, 3, 4, 5 on line L M the same distance between points, thus giving the full width of the pattern required.

From these various points draw lines at right angles with L M and intersect them with dotted lines drawn at right angles with pitch of cap and from points established in the elevation of the miter. Connect the points and we have *k h g* in Fig. 5 as the developed pattern for the D cap.

As the angle *h m* and *h n* in cap F are the same as *h k* in cap D, we make *h m* the same as *h k* in Fig. 5, or *k h m* as the pattern for the F cap miter *h m n*.

FLASHINGS.

In an elaborate edition of the Erie *Evening Herald* for September 14 notices are given of the local industries of greater prominence, among which is a reference to the Flickinger Roofing & Cornice Company, located at 408 West Eighteenth street, Erie, Pa. The firm started in business in 1891, and the main shop is 40 x 80 feet, with an additional building 20 x 50 feet, and from 15 to 20 skilled workmen are employed. The president of the concern is C. Flickinger; secretary and treasurer, W C. Shutte, and superintendent, U. S. Swiegard. In addition to making all kinds of sheet-metal work for roofs and cornices, they also, it is stated, handle the Prince Royal hot-air furnaces, the merits of which are alluded to.

Benoit Baillot Detombay of Chérée, Belgium, has secured patents in Belgium, France and the United States for an improvement in sheet-metal roofing, which is preferably made of zinc. The sheets are formed with a number of M shaped ribs extending lengthwise, and tongues are secured along the edges of each sheet in such a manner that one sheet will interlock with another. Similar tongues are secured under one end of each sheet, so that as the sheets are being laid the upper sheet will interlock with the lower. The upper end of each sheet is secured to the roof by nails which are driven through countersinks, thus preventing the nail heads from coming in contact with the upper sheet, which laps sufficiently to cover the nail heads. The ends of the sheets are bent slightly so as to form a close joint.

The Cortright Metal Roofing Company, Philadelphia, Pa., prepared especially for distribution at the World's Fair *fac-simile* samples of their well-known Victoria sheet-metal shingles. We understand from the company that they still have a considerable supply of these souvenirs on hand, and will be glad to mail a set of them to any address on request. The minature shingles are 2½ x 3½ inches in size, and are finished in brown Japan paint, giving them a very pleasing appearance. They furthermore reproduce exactly the characteristics of the large shingle, so that the merits of the regular goods can be investigated thoroughly in the small editions.

Niles, Ohio, is rapidly developing into an important center of the iron and steel roofing trade. The latest concern added to the list is one under the control of C. B. Cill of the Chicago Roofing Company, Chicago, Ill. It will probably cause as much surprise among roofers as it did among the citizens of Niles. Nothing was publicly known of the enterprise until Tuesday, September 5, when three acres of ground adjacent to the Russia Mill were purchased and grading commenced the same day. The building, 200 x 60 feet, is now in course of erection. It is stated that 25 men will be employed. The other roofing manufacturers at Niles are: Sykes Iron & Steel Roofing Company, Niles Iron & Steel Roofing Company, Curtis Steel Roofing Company, Niles Spouting & Roofing Company, all of whom are doing good business. Another sheet-metal working concern at Niles is the Niles Mfg. Company, makers of Galvanized eave trough, conductor pipe and patent plastering lath. There are seven sheet mills in this vicinity to supply the demands from these factories.

The American Roofing Company, St. Louis, Mo., report an increased trade. They are shipping a number of carloads to the Pacific Coast, and a carload of iron to the Cherokee Strip. Their business for the year is keeping up remarkably well considering the condition of business throughout the country, and from the way inquiries are now being received their fall business will compare favorably with that of last year.

The Vermont slate quarries controlled by the Slate Trust will be shut down for the winter after October 1 in order to reduce the output.

Sealed proposals will be received at the office of the Supervising Architect, Washington, D. C., until October 12 for all the labor and materials for the roof sheathing, slate and copper work of roof, down and drain pipes, &c., for the United States Custom House and Post Office building at Newark, N. J. Drawings and specifications can be obtained from the superintendent at Newark, N. J., or at the office of the Supervising Architect at Washington.

The very dry weather has caused disastrous forest fires in many parts of the country. Northern Wisconsin appears to have suffered most severely from this cause. Last week all Northern Wisconsin was one smoldering furnace, millions of dollars' worth of property having been destroyed. Great tracts of valuable timber land have been laid waste and towns have been wiped out of existence. Traffic on the Wisconsin Central Railroad was suspended owing to burned bridges. Rain only will check further and perhaps more serious damage.

SCRAP.

The total exports of tin plates and sheets from Great Britain to the United States during the first eight months of the present year were 198,452 tons, against 191,992 tons in the eight months ending August 31, 1892, an increase of nearly 6500 tons. Owing to the depreciation in price of this material, however, the increase in value of exports does not show a proportionate increase. In the month of August exports of tin plates to this country fell off very considerably, due largely to the financial depression existing on this side, which prevented importers from placing large orders with Welsh makers. The expectation of a possible readjustment of the tariff in the near future has also had a share in the unwillingness of American merchants to increase their stocks of imported tin plates. The figures showing shipments of tin plates from British ports to the United States in August are given in the Board of Trade returns as 15,784 tons, valued at $992,528, against 24,221 tons of the value of $1,511,367 exported in August, 1892.

Up to the present time tin ore has been found to a large extent in Cornwall, and to a more limited degree in Spain, France, Finland, Greenland, Sweden, China, Australia, and in both North and South America. The richest and most extensive deposits of the metal yet discovered are, however, in the Malay Peninsula and its neighboring islands.

A press dispatch from Ellwood, Ind., dated September 19, states that the large works of the American Tin Plate Company are running to their utmost capacity, and yet the concern is unable to keep pace with the volume of orders for their tin plates.

The black-plate mills of the New Castle Steel & Tin Plate Company, New Castle, Pa., are now completed and everything is ready for operations. The engines and roll trains have been running several weeks and have got down to their bearings. The tinning department is nearly completed. It is probably that this plant will be put into operation as soon as the steel plant of the Shenango Valley Steel Company starts up.

George H. Ismon, New York sales agent of the Falcon Iron & Nail Company, has received from that mill, as samples of their stock, some very handsome Bessemer steel sheets, cold rolled. They include regular tinning sheets 14 x 20 inches, and sheets 14 x 28 inches 0.013 inch thick. The Falcon Iron & Nail Company make sheets to 29 and 30 gauge up to 30 inches wide and 96 inches long.

STEAM AND HOT WATER.

The Springfield Coil Boiler.

The two illustrations shown herewith present views of the Springfield coil boiler, made by the Springfield Coil Boiler Company, 48 Hampden street, Springfield, Mass. Fig. 1 is an outside view of the boiler incased in brick, while the boiler proper is shown in Fig. 2. These boilers are made according to the Waterhouse patent, and, we understand from the company, have been tested during the past five years.

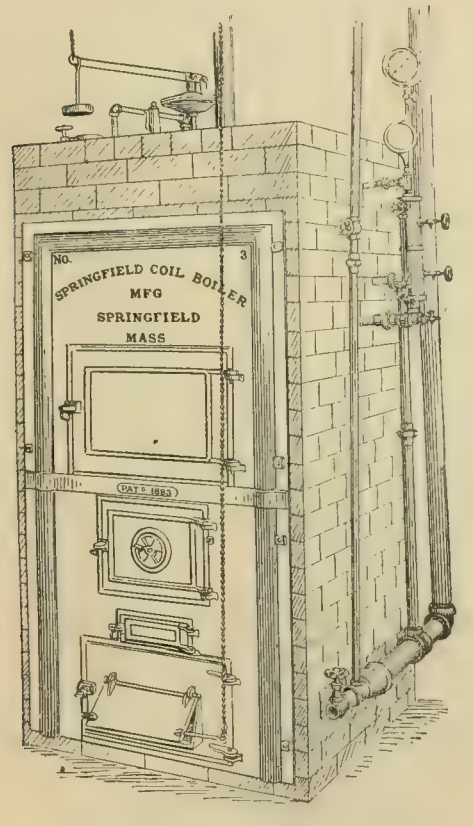


Fig. 1.—Boiler in Brick Setting.

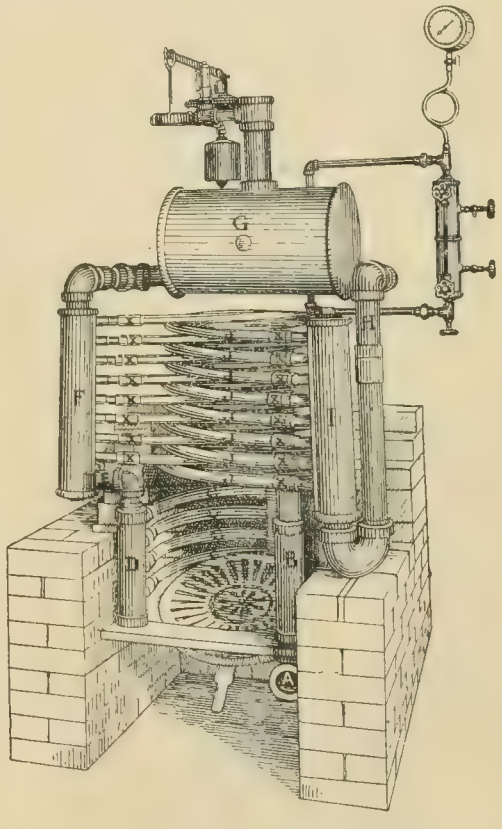


Fig. 2.—Boiler without Setting.

THE SPRINGFIELD COIL BOILER.

The pipe used in them, it is said, is made 25 per cent. thicker than ordinary pipe, and is coiled by new and improved machinery. Special claims are put forward for the circulating feature of the boiler, which makes it heat much more rapidly. Referring to Fig. 2, the water enters the boiler at A, being the point of filling and also where the returns come in. Thence the water enters the fire-pot standard B, circulating around the fire pot C to the other standard D. Through E it reaches the standard F, leading to the steam drum and water chamber G. A special feature of the apparatus is the standard H, through which the water circulates on the return to the coil standard I, then through the circulating coil J to the standard F, which completes the circuit. It is pointed out that there is a continual and uninterrupted circulation going on through all parts of the boiler as long as heat is applied, which prevents the formation of crust in the pipe. The coils J are 18 feet in length, or longer, according to the size of the boiler. These lie flat over the fire, one above another, and are of any number and size required. As indicated at X, any coil can be taken out or replaced at small cost by an ordinary fitter. The boilers are furnished with the usual trimmings. The grate is a feature for which a patent has been applied, being double acting and center shaking. The center of this grate turns faster than the outside and in the opposite direction.

HEATING NOTES.

The H. R. Barker Mfg. Company, Lowell, Mass., issue a neat circular of the Richmond steam and hot water heaters, which they handle and install. The circular is bound in dark orange paper and the letterpress within will be of interest to the heating trade. It gives careful information concerning the extensive line of Richmond heaters, the text being illustrated with numerous general and sectional engravings. Full tables of prices and sizes also accompany the illustrations, and at the end reference is made to a variety of radiators. At the close is a list of references of users of Richmond heaters in Lowell and vicinity.

Among the recent contracts taken by representatives of the J. F. Pease Furnace Company, Syracuse, N. Y., or their local agents for furnishing Economy heaters are the following: Three hotels at Carthage, N. Y.; hotels at Binghamton, Roscoe and Fayetteville; schools at Amsterdam and Windsor, N. Y., and New Milford, Pa.; church at Penn Argyle, Pa.; hospital at Newark, Ohio, and block at Carthage, N. Y. They have also orders for steam, hot-water and combination heaters for 34 different residences in different cities of New York State, and some in Ohio and Pennsylvania.

The Nashville Machine Company, Nashville, Tenn., report that in spite of the dull times and bank failures their trade is proving satisfactory. They are looking forward to a large fall business, particularly in the G. & J. R. Bolton hot-water heaters, which they manufacture. They have a number of inquiries, and are constructing some of their largest sizes for the Western trade. They carry a large stock on hand and can supply all orders on short notice.

E. N. Squires returned home to Geneva, N. Y., quite recently, after a successful business trip during which he sold 14 large-size Dunning boilers, all for heating Government buildings. Mr. Squires is a well-known feature of the New York Central

Iron Works Company, and is well able to chant the praises of the Dunning boiler.

J. G. ZELLER of Richmond, Ind., has been selected as one of the experts to decide upon the plan of steam heating to be adopted for heating an asylum in Ohio.

IN A RECENT ISSUE of the *Daily Courier Post* of Hannibal, Mo., there is a published correspondence respecting the Novelty Circulator, which indicates that this boiler has given excellent results when in use.

A PAMPHLET entitled "The Fowler Boiler: What It Is and Where to Get It," is a neat publication issued by the Fowler Boiler Company of Providence, R. I. These boilers are intended for various purposes. In addition to those designed more especially for marine and stationary boilers and yacht engines, the boilers are also made for house heating. They are described as very strong and extremely economical in fuel consumption. The form of the apparatus is also well adapted for combination heating and power purposes. The boiler consists essentially of vertical annular waterways made of large and small tubes, grouped around a larger central water space of the same design. Special attention is called to the double jacketing of the boilers and asbestos lagging for preventing waste of heat.

ARTICLES OF INCORPORATION under the laws of Illinois have been secured by the Samuel I Pope Company, at Chicago; capital stock, $60,000; manufacturers and contractors of steam heating apparatus; incorporators, Samuel I. Pope, Charles H. Ralton and William A. Pope. The company will take over the business now conducted by Samuel I. Pope & Co. at 360 Dearborn street, Chicago.

THE CAPITAL STOCK of the Baker & Smith Company, 193 to 197 Van Buren street, Chicago, has been increased from $150,000 to $200,000.

Prouty's Wire Valve Wheels.

N. H. Prouty, Charlton City, Mass., is introducing wire valve wheels, as shown in the accompanying cuts. As seen in Fig. 1, the wheel consists of a metal hub plate surrounded by coiled

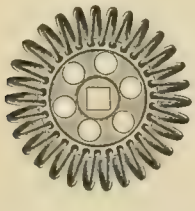


Fig. 1.—Wire Valve Wheel.

wire, all nickel plated. The manufacturer refers to the combination of the coiled wire and the hub plate being such as to give a strong, rigid wheel, a good grasping surface for wet or greasy hands, and as presenting a pleasing appearance to the eye, and states that they are always cool. The point is made that these wheels are not open to the objection of warping and splitting off, as wooden wheels used for this class of work are; and that the wire wheel is the cheapest, repairs being taken into consideration. It is remarked that those in charge of boilers would be more apt to test try cocks and gauges if valve wheels were used that were always cool. The wheels are made to fit all sizes and makes of valves, &c., and are designed for use on throttle

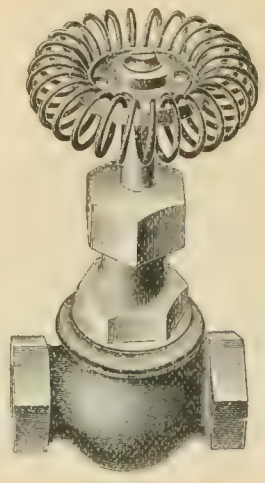
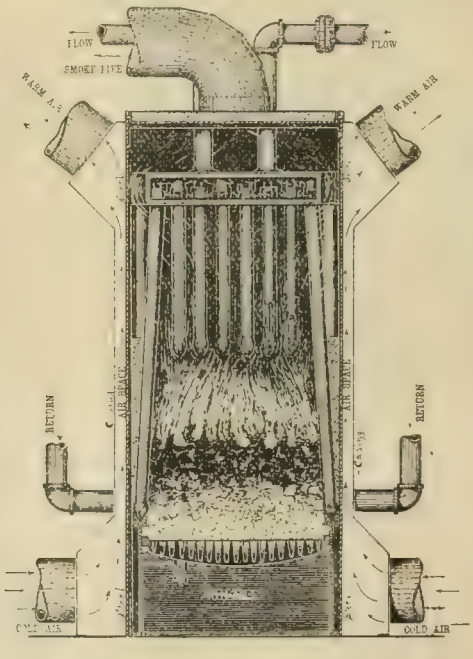


Fig. 2.—Wire Wheel on Valve.

valves, radiators, water glasses, gauge cocks, oilers, injectors, and all hot valves.

Farquhar's Ventilating Hot-Water Heater.

The Farquhar Heating Company, 58 Dearborn street, Chicago, and 217 West Locust street, Des Moines, Iowa, are manufacturing the ventilating hot-water heater which is herewith illustrated. This heater is designed to obviate the use of indirect radiators where ventilation is desired. The outer casing is of galvanized iron, enlarged at the base to form a cold-air distributing chamber, from which one or more pipes lead to the outer air, or air can be taken from the basement if desired. A similar enlargement of the jacket at the top forms a warm-air gathering chamber, from which pipes can be connected with the rooms above. Inside of the galvanized jacket is a similar one of steel, which surrounds the heater, except in front. The steel plates forming this jacket are exposed to the fire, and thus heat the air as it passes in at the base, up between the two jackets and out through the gathering chamber. The construction of the inner jacket is such that there are no seams in the fresh-air chamber to be exposed to the action of fire, and thus all danger from the leakage of gas is obviated. It is claimed that the air heating space thus formed increases the capacity of the heater, that it is a substitute for brick work, and that less radiating surface is required in the rooms supplied with warm air; also that the water circulating system is simplified by avoiding indirect coils, which are liable to freeze. This heater is provided with Farquhar's circulating drop tubes, self mounting rocking grates and balanced draft regulator.



Farquhar's Ventilating Hot-Water Heater.

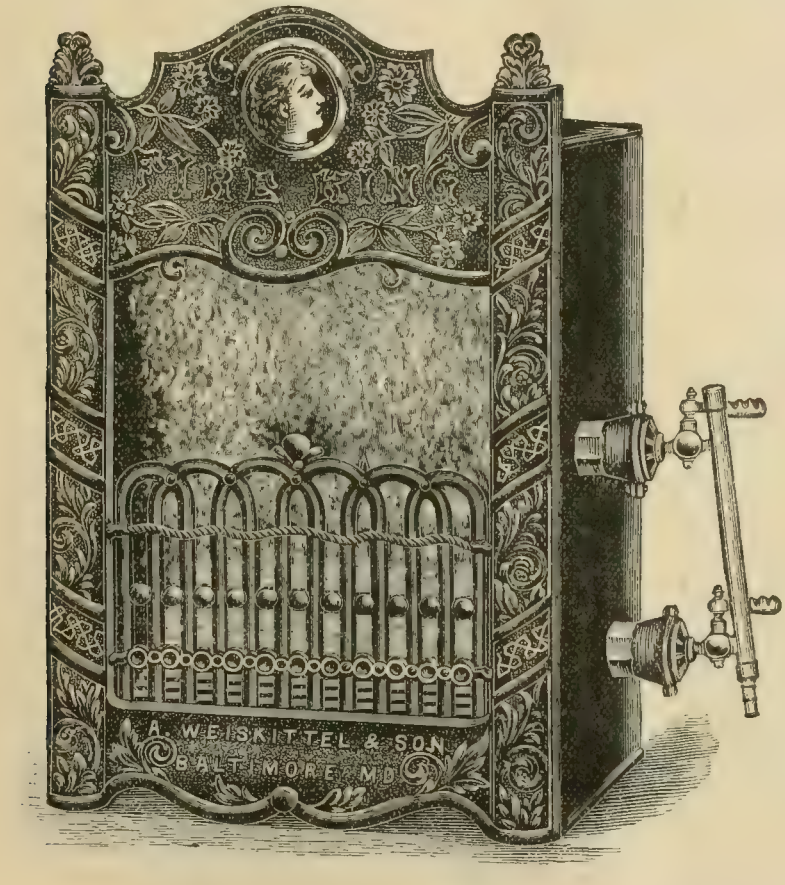
The desirability of establishing coaling stations for the navy abroad is again being taken into consideration by the Government. It is announced that efforts will be made by the new United States Minister to Hayti to acquire Mole St. Nicholas for the purpose, and the purchase of one of the Galapagos Islands from Ecuador is suggested. The cessions of coaling facilities at Samoa and Pearl River, in the Hawaiian Islands, which have long been expected, will probably now be pushed to an issue.

Orange, N. J., enjoys the rather unique distinction of possessing a large force of workingmen who have been farseeing enough to request a reduction of wages. These are the men employed by the Suburban Traction Company, whose business has been greatly curtailed since the closing down of the Orange hat factories. Knowing that the line was being operated at a loss, the men a few days ago, in a communication addressed to the president of the company, offered to work for reduced wages until better times. Their offer was frankly accepted.

The receivers of the Northern Pacific railroad reported on Monday to the United States Court in Milwaukee, recommending the canceling of the Wisconsin Central lease.

The Fire King Gas Heating Stove.

We present a general view of a new gas heating stove made under the name Fire King, which has been placed on the market by A. Weiskittel & Son, Baltimore, Md. The line embraces stoves made in all styles and sizes with either copper reflectors or asbestos frame plates, and finished with or without tile ornamentation. The copper reflector stoves have perforated tops and are constructed to take cold air from the floor, pass it up through the stove and discharge it in a highly heated condition at the top. This arrangement, the manufacturers state, keeps the air in the room in constant circulation, while at the same time the efficiency of the



The Fire King Gas Heating Stove.

stove is greatly increased. In addition to the line of square gas heaters the company also make three sizes of round stoves embodying the features described. The round stoves are neatly ornamented with nickel and the fronts are set with cut glass jewels so arranged that the light from the burners produces brilliant effects. The makers refer to the patent lighter cocks employed in connnection with these stoves as an important improvement and that the smooth castings, fine nickel work, attractive design and finish and powerful heating qualities render the Fire King first class in every particular. The company have just issued from the press a new catalogue and are mailing copies to their friends in the trade.

THE WALCOTT HURLBUT COMPANY, 175 and 177 Lake street, Chicago, have lately supplied the Syphon Eduction range closets for school buildings in La Crosse and Fort Howard, Wis.; Waukegan, La Grange, Western Springs and Freeport, Ill.; Goshen, Ind.

HEATING AND PLUMBING.

NEW WORK AND CONTRACTS.

REEVES & WEST, Gloucester City, N. J., are at present employed on a steam heating plant for the Camden (N. J.) City Hall, consisting of two 35 horse-power horizontal return tubular boilers, with 6000 feet of direct radiation. Among other steam heating contracts on hand are the new publishing house, Camden; store and dwelling for Dr. Trenchard, Glassboro; also, at the same place, dwelling for John Gandy; store and dwelling for A. J. Mann, and dwellings for John P. Stanger and W. H. Beckett; two dwellings for Henry J. West at Gloucester City, N. J.; a hotel for Edward Elliott and a power house and car shed for the Gloucester Electric Railroad. Also, hot-water heating for a dwelling for Harry Reeves, Gloucester City.

SEALED PROPOSALS will be received at the office of the Supervising Architect at Washington, D. C., until October 20 for the steam heating apparatus and pipe tunnel in the United States Marine Hospital, San Francisco, Cal., according to drawings and specifications, copies of which can be had from the Supervising Architect at Washington, or at the office of the Surgeon at the Marine Hospital at San Francisco.

HODGMAN & Co, of Camden, Maine, are having a steam heating plant put in their building.

RUFE & BRO., Doylestown, Pa., have just secured the contracts for heating the new church at Dublin and Frank Keller's residence at Doylestown with steam They also have the contract for heating and plumbing the new house of Joseph Hendricks, at Blooming Glen.

THAYER HEATER COMPANY, Boston, Mass., have been awarded contracts for heating the new depots at Wareham and North Abington, Mass., on the New York, New Haven & Hartford Railroad.

W. T. PERKINS of Dover, N H, has a crew of fitters engaged in installing the steam heating apparatus in the hotel at Milton, which will occupy some time.

JAMES B. CLOW & SON, Lake and Franklin streets, Chicago, have taken the contract for furnishing 40 carloads of Akron sewer pipe for the Pullman farm, Pullman, Ill.

JOHN W. MILLS, 100 Lake street, Chicago, Western sales agents for the United States Heater Company, has secured the order for the hot water heaters to be used in heating several of the cottages connected with the insane asylum at Kankakee, Ill. Ten No. 20 Bolton hot-water heaters are to be delivered by October 1. This is one of the largest single orders received by any heating company this season.

THE BAKER & SMITH COMPANY, 193 to 197 Van Buren street, Chicago, are to furnish the steam heating plant for residence of W. O. Leeds, Michigan City, Ind. A locomotive boiler 40 inches by 7 feet 3 inches will be used in connection with Champion radiators.

E. BAGGOT, 169 and 171 Adams street, Chicago, has the contract for the plumbing, gas fitting and sewerage in the elegant residence of J. H. Snitzler, Drexel boulevard near Forty-first street.

THE CONTRACTS for hot-water heating in Sanitorum, St. Joseph's Convent and St. Mary's School were taken by Cordes & Dries, 126 Clybourn street, Milwaukee, assisted by John W. Mills, 100 Lake street, Chicago, at whose office the necessary plans and drawings were made.

THE AMERICAN RADIATOR COMPANY of Chicago closed, on September 15, a contract at their World's Fair exhibit with the official engineers of the city of Hamburg, Germany, for four carloads of steam radiators, to be used in heating the magnificent new municipal buildings in the city.

H. WILLARD will put the heating apparatus in St. Mary's Convent building at New Milford, Mass, and in the new residence of L. Fale and Geo. W. Bullard's residence at West Medway. Page heaters will be used in each case.

JOEL C. GLEASON has nearly completed the installation of the steam heating plant in the almshouse at Marlboro, Mass.

THE heating apparatus for the new Whipple-Freeman block at Brockton, Mass., will be furnished by L. R. Churchill.

M. J. CARBOY, 78 Dearborn street, Chicago, is doing the plumbing in Ryerson and Kent Chemical Halls, Chicago University.

AMONG the contracts recently taken by the John Davis Company, heating contractors and jobbers of material, 69 79 Michigan street, Chicago, can be mentioned hot-water heating for the First National Bank, Terre Haute, Ind.; steam heating plants for Rush Medical College and Academy of Science, Chicago; Insane Asylum, Kalamazoo, Mich.

STOVE TRADE NOTES.

Future of the Hot-Air Furnace.

By A. W. Glessner,

President of the Excelsior Steel Furnace Company.

SEASON FOR WORK

The furnaceman labors at a great disadvantage in having the bulk of his year's work pressed into three or four months, and in this respect he is much less fortunate than the steam and hot-water men, whose work is continuous throughout the year, with only a slight quickening in pace as the winter approaches. The class of buildings and of owners accounts in great measure for this difference, and in addition is the fact that the preliminary work and concealed work is much greater with the hot water and steam contractors than with the hot-air men. The customer of the furnace contractor is often a man who has a house to heat and wants a furnace. He intends to heat the first floor only, and although he begins to figure on the job along in April he cannot be induced to sign a contract until the first frost of the fall has come, and then, at that particular time, all of the people of the town are seized with the idea that their stoves must be put up at once. As a result, the dealer has his hands full, sometimes so full that his customers suffer, particularly the man who orders his furnace at the last moment and has it slapped in in a hurry. The result is often a poorly considered, poorly installed furnace job, which cannot be made to do good work, and a displeased customer lives to tell the tale and injure that particular furnace in the town.

QUALITY OF THE WORK.

It is difficult to get owners to have work done during the spring and summer months, and yet that must be done if the furnace business is properly developed. Good work cannot be done in a hurry and in the midst of the annoyances that always characterize the fall rush season. Some means must be devised to spread the furnace business over a greater period, and (if in no other way) by discriminating against fall work by a difference in price in favor of those who have their work done early in the year. The manufacturer can likewise offer an inducement to those dealers who buy early and pay for the goods. If he carries the goods in his warehouse or on his customers' floors there is an interest and expense account working diligently both day and night which would be reduced materially if the furnace season was not bunched into three or four months, and he could afford to sell his wares cheaper in April than in October, after he has carried them six months longer.

DELAYS DANGEROUS.

By waking up the furnace trade early in the year and making prices considerably lower during the spring and summer months owners would soon realize that "delays are dangerous," and come in out of the cold long before the busy season came around, and the delinquents, of whom there will always be some, will have to pay for bringing up the rear. It is impossible for dealers to do ample justice to work in October and November when their men are being worked to the limit of endurance, and the bad work done during the fall survives the rush and makes no end of trouble, and directly affects the "future of the hot-air furnace."

(To be continued.)

Stove Exhibits at the New York State Fair.

Prominent among the concerns making displays of their goods at the New York State Fair, recently held in Syracuse, may be noted the following :

THE J. F PEACE FURNACE COMPANY,

Syracuse, were represented by their permanent building only, that structure being a counterpart in form of an Economy heater complete with casing. A notice upon the building informed those interested that on account of business, resulting from their present exhibit at the World's Fair, no time had been permitted them to prepare samples for this fair. Visitors were invited to inspect their line at the show room of the company.

THE HOWARD FURNACE COMPANY,

Syracuse, made the customary attractive showing of the Howard warm-air furnaces and combination heaters. Conspicuous in this display were examples of the Howard single-radiator furnace and single-radiator warm-air and hot-water heater, accessions to this line during the past year. These, together with the many styles and sizes of this make of heaters, completed a more than ever satisfying exhibit.

The exhibit of the company was in the permanent building erected two years since for annual use, and is one of the striking features of the New York State Fair. W. E. Ford, associated with Mr Van Kuren, were in charge of the display and to receive patrons.

THE HOWARD THERMOSTAT COMPANY,

Syracuse, made an exhibit of the Isothermo thermostat, the product of that company's works, which was shown in connection with the display of Howard heaters.

TUTTLE & BAILEY

had a representative exhibit of their manufacture of registers in the Howard Furnace Company's building, and were included in the display made by the company of the Howard heaters.

THE CARTON FURNACE COMPANY,

Utica, were contributors to the success of the fair by a representative collection of their line of Carton furnaces and heaters The company occupied their own building on the grounds, familiarly known as the Carton Castle. The arrangement of the exhibit of the heaters of this manufacture was with excellent effect for display and convenience of inspection. W. G. Barrows, salesman of the company, with assistants, was in attendance at this display throughout the week.

THE KERNAN FURNACE COMPANY,

Utica, were exhibitors at the fair of their line of Kernan furnaces, which embraced examples of each size and class of their warm-air heaters for hard or soft coal. The heaters were arranged attractively in the building built for this purpose, and as occupied for several years past by them at the annual State fair. In conjunction with the display of Kernan furnaces, occupying jointly one-half of the same building, was the display of the

SYRACUSE STOVE WORKS'

line of Welcome stoves and ranges. The display of this company's line of heating stoves and ranges proved by its patronage of visitors to be one of the leading features of the exhibition. The joint display was under the supervision of D Plaisted & Son, agents in Syracuse for the two companies named.

KIEFFER BROTHERS,

Syracuse. were among the exhibitors at the fair, their display being mainly a showing in a distinctive and well-conceived manner of the Michigan Stove Company's line of Garland heating stoves and the Pittston Stove Company's Happy Thought ranges, for which Messrs Kieffer Brothers are the agents in Syracuse.

THE PHILLIPS & CLARK STOVE COMPANY

were prominent at the fair by an exhibit of their line of Andes stoves and ranges in the building occupied, as in previous years, by Hessler & Schafer, agents for the Phillips & Clark Stove Company in Syracuse. The display embraced a full line of the goods named and appeared to excellent advantage as arranged by the exhibitors.

THE NASON MFG COMPANY,

Beekman street, N. Y., were exhibitors in the main building of the fair, showing samples of their Equator steam and Gulf Stream hot-water heater.

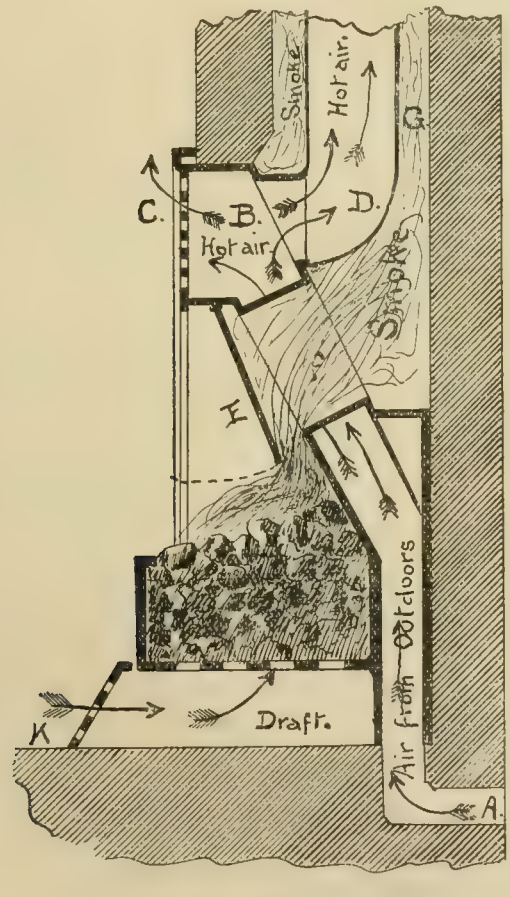
THE KELSEY FURNACE COMPANY,

Syracuse, met those of their patrons and visitors at the fair during the week who were interested in the Kelsey furnace at their warerooms, 389 West Fayette street, where opportunity for inspection of that line of heaters was afforded them.

The Gobeille Pattern Company of Cleveland, Ohio, who are nothing if not original in their manner of bringing the merits of their goods to the notice of their customers, have brought out a useful and serviceable reminder of themselves in the shape of a compound blotter. The pad is built up of four sheets of unequal size, and the areas represent the volume of business done in the years 1889 to 1893. The enlargement last year over the preceding years is graphically shown in the contrast of a blue and pink blotting sheet.

The Jackson Heating and Ventilating Grate.

Edwin A. Jackson & Bro., 50 Beekman street, New York, are directing the attention of architects, builders, dealers and others interested to new features in their combined heating and ventilating grate, as here illustrated. The heating power of the open fire place has been gradually increased in the Jackson ventilating grates, until now, in their opinion, they stand as rivals to the furnace, steam or hot water heaters, both in effi ciency and economy. The principle of an air chamber around the grate, introducing outdoor air, as in the furnace, and combining the indirect with direct system of heating, has been used from the first. This gives, they say, over four times the volume of heat obtained from ordinary grates consuming the same amount of fuel, and allows each fire place to heat several rooms on one



The Jackson Heatir g and Ventilating Grate.

or more floors. This latest improvement is in the shape of the back. Instead of the vertical sides and back, as in the old form, with the opening to the flue at the top of the grate, an over-hang back is introduced, and the smoke goes through this instead of over the top. The advantages of the forward slope are apparent, as a far larger portion of radiant heat is thrown into the room and none can, as in other grates, pass directly from the fire into the chimney. A curtain blower hangs over the opening in the back, checking the draft, when so desired, or, when drawn out, acting as a hood or blower as fresh fuel is added. This dispenses with the need of a porta ble blower and gives a better control of the fire. Emphasis is laid on the fact that the back is a heavy iron casting in a single piece. Therefore there are no joints for the leakage of gas from the fire to the air chamber and the casting cannot become overheated, as those in use over 16 years, of a former construction, are apparently as good as ever. The cut shows the grate arranged to heat on two floors. A indicates the cold-air inlet conducting air to the chamber B, where it is sent to the lower room through the register C, or through the pipe D to the floor above. The air is heated in the air chamber before escaping to either room. The draft of the fire is supplied at K, the smoke passing under the curtain blower E, through the opening F, into the smoke flue G.

Gas for Heating and Cooking.

In a recent discussion on the extension of the use of gas as a fuel, before an association of manufacturers, as reported by the London *Gas World*, one speaker made the following remarks: All are deeply concerned in the development of cooking by gas, and the more attention they devoted to this part of their business the better it would be for the interests of those they served. Another speaker, who had pushed the use of gas stoves, said that his experience with gas fires was not a very encouraging one. About five years ago he started fitting up gas cookers—he did not encourage fires because he did not believe in them altogether. He had them all through his own house, but he thought they were too expensive for common use. When consulted upon the subject he told people that if they were prepared to pay for a gas fire they could have it. No doubt gas fires were very nice for an office, so that papers might be kept free from dirt, or for use in a bedroom for an hour at night; but for other purposes he would not have them. On the other hand, he advised every householder to have a cooker. The domestic servant was the difficulty in the city where he was situated, which was, perhaps, more peculiarly situated than other towns in this respect. Many of the ladies there did little or no work in the kitchen—they left everything to the servant. When a gas stove was tried it was often given up owing to its expense; and thus it was condemned because of the neglect of the domestic. Householders ought to be encouraged to use these stoves. He was always willing to give instruction to any one who thought of introducing one. He had connected the cooker he had at home with a meter to see how much gas was being used, and to discover what the expenditure would be in a given time, and he found that the quantity of gas consumed was 500 cubic feet per week, over a period of four or five years. This was for all the cooking for a family of six people. Compared with other houses the expense worked out very much to the same figure. He would like to see cooking by gas more general throughout the country. The use of gas might also be advocated for boiling rings and for bath heaters. Many of the latter apparatus were in use that were inexpensive and very effective. The application of some of the principles of improved coal stove construction by American manufacturers to their heating stoves renders them more economical than the gas fires referred to above and not subject to the same objectionable expense. The information given on the consumption of gas for cooking can be duplicated by many families here, and even more favorable experience cited. With a more thorough acquaintance with the advantages of gas for fuel the sale of gas stoves will be increased. The use of gas stoves in the tenements of the poorer classes in New York is more general than is supposed and is extending. The cheap stoves that have been purchased largely as an experiment have been an agreeable surprise to their users and the demand for a better grade stove is increasing as the result.

Taunton Notes.

The Taunton stove concerns have all resumed operations, most of them on full time, and although there is no very marked increase in orders, the general outlook is regarded as brighter.

White, Warner & Co. have worked full time all summer, with the exception of two weeks in June, when they closed down in order to enlarge their plant. A new foundry 60 x 75 feet has just been completed by this firm, which will accommodate 20 molders, and their line has been increased by the addition of a new parlor stove, the Household Square, made in two sizes, fitted with draw-center grate, highly ornamented, and intended for a high-grade stove. A round parlor stove in three, and a wood stove, the Household Cottage, in two sizes, will also be put on the market for the fall trade.

R. E. Walker of the Weir Stove Company has just returned from Chicago, where he has been doing the fair.

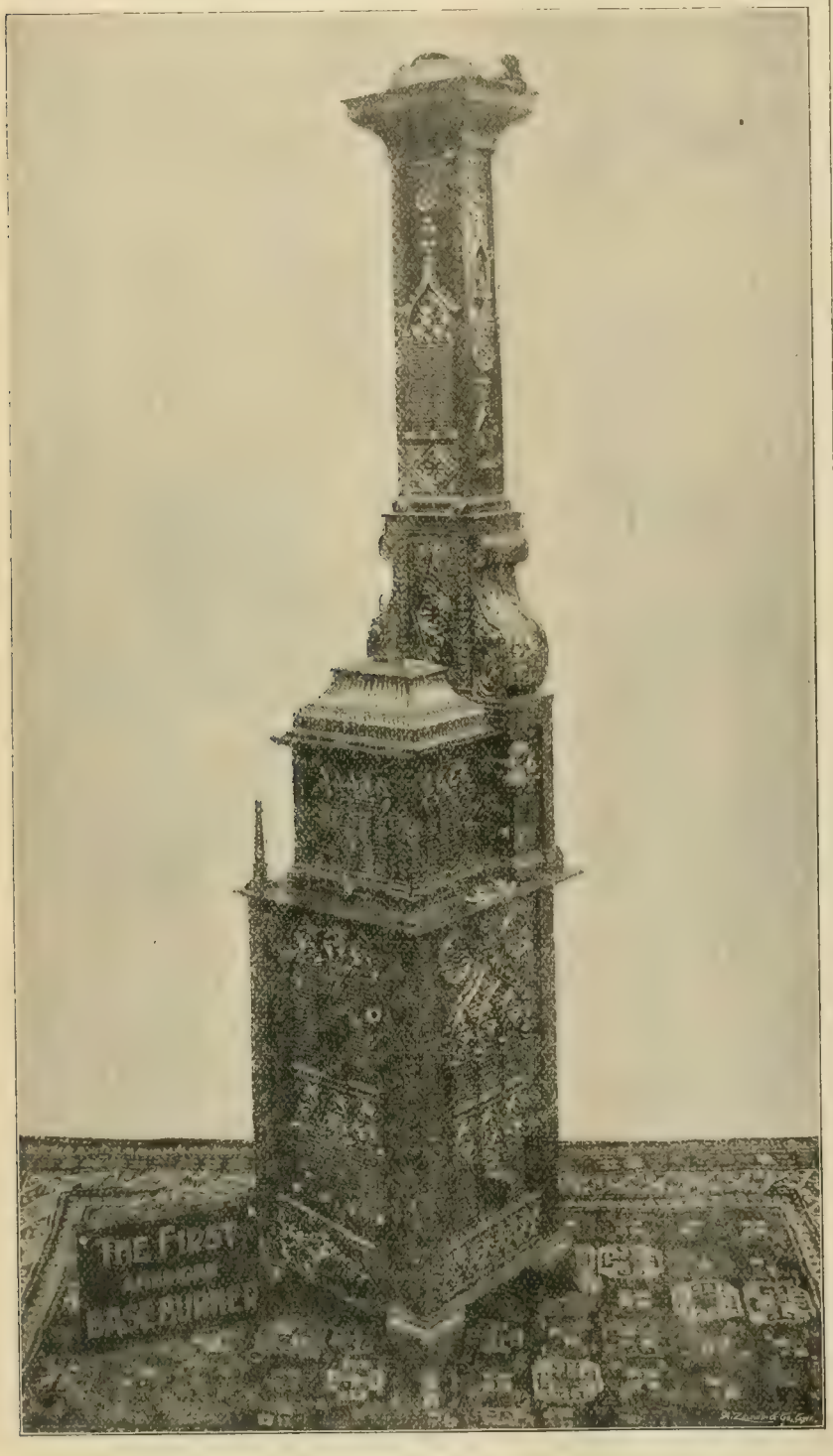
O. G. Thomas will not put any new styles on the market this season, but will push the old lines.

The Weir Stove Company have recently put on the market a new range in four sizes, which is known as the Glenwood H. The only new feat-

ure is the absence of nickel work except on the corners. This saves trouble in keeping bright, and adds to the artistic appearance of the range. Our Glenwood, a new round parlor stove in two sizes, is in preparation.

A Unique Base Burner.

In the accompanying illustration we present a general view of a stove of curious design, which is said to be the first base burner produced in this country. Unfortunately, we are not in possession of facts which will enable us to lay before our readers a general description of the interior construction or to indicate in any way the principle involved. The design, however, is unique and as a curiosity will warrant study on the part of those who are interested in the early history of the stove trade. For the engraving here presented we are indebted to the Michigan Stove Company of Chicago.



A Unique Base Burner.

The Buckwalter Stove Company,

proprietors of the Continental Stove Works, Royersford, Pa., have just issued a catalogue of their stoves, ranges and heaters, and all previous price-lists are by this issue withdrawn. The volume is in handy form, being about one-half the size of their previous catalogue. It contains 130 pages copiously illustrated, and all the cuts are new. It is tastefully bound in stiff paper covers, strengthened with linen, the front handsomely lithographed in colors and having for a centerpiece the striking trade-mark of the company, while on the back is an illustration of their works. An announcement to the trade, in which mention is made of the excellent shipping facilities enjoyed by the company, with a list of terms and special notices and directions for ordering repairs, precede the descriptions of the goods. The new goods described in the book include the Art Ringgold base-burning double heater, with straight draft or full revertible flue, portable full nickel dome, nickel base and foot rails, large magazine with automatic cover, heavy fire pot, with Ransom's improved Duplex and shaking grate, large ash pit and an ash pan that catches all the refuse; the Art Ringgold single heater, similar in most respects to the double heater; the Ensign heater for anthracite or bituminous coal, a straight draft surface burner of handsome design, with nickeled feet and skirting, foot rails, name plate, spun urn ornament, patent center-discharge grate, heavy fire pot and large ash pit; and the Ecipse Duplex furnace in its improved form, with massive and attractive front, enlarged ash pit and ash-pit door, upper or dome section in one piece and front vapor pan. The remainder of the catalogue is devoted to Apollo ranges, which are now supplied with either right or left hand oven doors; Model Apollo ranges; heating attachment for upper rooms for use in connection with Apollo ranges; New Cresta, Art Canopy, Canopy, Pluck, Energy, Samson, Comrade, Coral, Coin, Dakota and Archer ranges; Art, New Eclipse, Geneva and other cook stoves; Happy Greeting, Ringgold, Magic Ringgold, New Opera, Homer, Laura and other heating stoves; laundry, tailors' and farmers' stoves; Eclipse and Storm furnaces; a handsome line of fire-place heaters, including the Royal Empire ventilating grate and heater, with and without art tiles, a comparatively new addition to the line; lists of shoe furnishings and repairs, and a well-arranged index.

ODD PLATES.

The Miller Grate Company of Cleveland, Ohio, are the assignees of a patent granted to Peter I Miller of that place for a gas burner designed for use in connection with heating stoves or grates. The burner has a large combustion surface provided with openings at intervals, through which the gas flows. Arranged about the openings is asbestos or other uninflammable material, thus giving, the inventor claims, an evenly distributed blue flame to the entire front of the burner.

The Phillips & Clark Stove Company of Geneva and Troy, N. Y., have met with gratifying success at a number of fairs recently held at which their goods were displayed. The company secured first premium at the Troy and New England Fairs recently held in Troy, N. Y., and also first premium at the Cambridge Fair, held at Cambridge, from September 5 to 8, inclusive.

Floyd, Wells & Co. of Royersford, Pa., have issued an eight page circular illustrating and describing some of their leading specialties. The goods shown include the New Rosemont, a full revertible flue double heater, fitted with Ransom duplex grate and improved shaking device; the Jewel Rosemont, a well proportioned full revertible heater made in several sizes; the Special, an open Franklin stove with circular fire pot, and the Irving range, made with reverberatory oven and corrugated oven plate. The construction

employed is such, the makers claim, that a continuous rotary circulation of the air in the oven is secured independent of that obtained by their method of oven ventilation. By it the heated air is conveyed to the article to be cooked "this action being caused by special flues in the oven plate which constantly carry the hot air from the oven plates to displace the lower temperatures surrounding the article in process of cooking. As one current of air is partly cooled by absorption in contact with the article cooking, it is driven away by another current of highly heated air, thereby cooking much more rapidly." The company claim that by the use of a corrugated oven plate a gain of about 20 per cent. of radiating surface is secured.

The Art Stove Company, Detroit, Mich., have recently been granted a patent covering the construction employed in connection with their oil heaters, for which a very gratifying demand is reported.

According to a recent issue of the *Daily Journal*, published at Middletown, Pa., the management of the Lebanon Stove Works, Lebanon, Pa., will, on October 1, pass into the hands of J. Max Reilly, who for several years has been employed in the general office of the Raymond & Campbell Mfg. Company. Mr. Reilly has obtained an interest in the Lebanon Works and is well qualified for the position to which he has been called by the directors.

The Union Stove Works, 70 Beekman street, New York, are issuing a seasonable nine-page sheet, printed in two colors and devoted to sheet-iron stoves. The Dash comes first and is intended to meet the demand for something cheap. The Flirt occupies seven pages with its variations of direct draft, revertible flue and extension top, and is furnished in seven sizes, from 8 to 16 inch cylinder. The Belmar is a handsome square stove of "brand new construction that leaves little to be desired." On the back page is an engraving of their Commander furnace, showing the internals, which in this case consist of an advertisement of their line of goods and an invitation to send for a catalogue.

Furnaces and furnace fittings made by the Excelsior Steel Furnace Company of Chicago, Ill., are being shipped to many new and old customers at this time. The company say that the furnace business is on the move to a higher plane, and that the trade show an appreciation of all steps toward improvement.

A handsome dark green leather card case, bearing in gilt letters "Compliments of Richmond Stove Company," comes to hand, bearing a steel engraved card of the house, a feature of which is the trade-mark of the Richmond stoves, ranges, furnaces and steam and hot-water heaters.

A very elaborate pamphlet is published by the Bennett & Peck Heating & Ventilating Company, Cincinnati, Ohio. The volume is bound in glazed and tinted paper, measures 9 x 11½ inches, and contains about 80 pages of letterpress. A very thorough description of the system of heating and ventilation employed by this company is presented in the pamphlet, and it also contains much miscellaneous information on the subject. A notable feature of the publication are the colored plates of the Bennett & Peck apparatus, showing the arrangement of the flues in schoolhouses and also the construction of the different furnaces for schoolhouses and churches. Other illustrations in plain colors are scattered through the book, giving further particulars about this apparatus and system. It will also be noticed that there are many humorous and illustrative sketches, teaching graphically the advantage of the Bennett & Peck system. In addition to that part of the publication which is devoted to mere catalogue purposes, there is also a great deal of information on the general subjects of heating and sanitation, the importance of pure air being continually insisted on, as it is proper that it should be.

In a late issue of *Art in Advertising*, E. C. Moses of the J. F. Pease Furnace Company, Syracuse, N. Y., has an interesting article on "Advertising at the World's Fair," in which he tells his experience with his concern at the exhibition, and gives as the result of his experience that he is well satisfied with the advertising that the fair afforded. Along with the article is a half-tone engraving, giving a pretty view of the Pease exhibit at the fair.

The Michigan Stove Company have sent us a package of the circulars they are now distributing to the trade. There is a sheet of "local notices" suitable for insertion by dealers in their local newspapers. Another sheet shows different sizes of cuts of the Garland trade-mark, prepared for the use of merchants in advertising in local newspapers. A very tasteful circular letter calls attention to the manner in which the company are advertising, and shows merchants how to co-operate so as to secure direct benefit from the plan at comparatively light cost to themselves. A "Drawing Book for Young People" contains a number of pleasing subjects, outlined in white on a black background, and affords something for steady occupation by young folks during the long winter evenings now rapidly approaching.

The Bloomington Stove Company of Bloomington, Ill., have recently completed a new engine and boiler house, which puts their plant in very much better shape for manufacturing.

McLaughlin & Co. of Second and Willow streets, Philadelphia, stove pattern makers, have removed to 215 North Second street, in that city, where in future the business will be continued under the style of John K. McLaughlin.

The stove warehouse of Graff & Co., Pittsburgh, was damaged by fire to the extent of $1000 last Monday.

The Superior Furnace Company, Little Falls, N. Y., send out advertising cards to the trade that convey a strange impression concerning the buildings at the Chicago Fair. The engravings are very neatly executed, but they show the walls of the buildings highly colored in a variety of ways, which will be a surprise to those who are familiar with the White City. The back of the cards contains advertising matter relating to the products of the concern.

The Manhattan Brass Company, with salesrooms at 44 Murray street and with factories in East Twenty seventh and Twenty-eighth streets, New York, send us an illustrated circular of the Star heater, intended for burning oil as a fuel. These goods very much resemble large lamps with a heating drum in the place of a chimney. They are made of brass, oxydized and nickel plated, with aluminum top and Russia iron cylinder. The makers claim that this device will heat a room 15 x 20 feet in size to the temperature of 70° in the coldest weather, at a cost of about 1 cent per hour. The four sizes of the Star heater are shown in the circular before us. The goods are referred to as being light and portable, as well as attractive and powerful for heating purposes.

We are indebted to the Superior Furnace Company, Little Falls, N. Y., for a poster lithographed in colors, showing a sectional view of the Superior steel furnace and giving an excellent idea of its construction. The poster is printed in five colors, which enables one at a glance to follow the course of the products of combustion from the fire pot to the smoke pipe. Accompanying the poster we find circulars showing the Superior steel range, which is made in several sizes and varieties, and which embodies features of construction that cannot fail to command the attention of the trade. A second circular shows the various styles of the Superior line of furnaces and ranges as manufactured by the company at this time. These novelties are being distributed to the customers of the Superior Furnace Company and, we are informed, are bringing out numerous congratulatory letters upon this method of advertising. Last week the company started their works after a brief shut down, and report the receipt of a number of good-sized orders for their product. The indications point to a lively trade during the last quarter of the year, especially in the Middle, Western and Eastern States. The company report a complete stock of goods on hand, which will enable them to make prompt shipments.

The John Van Range Company of Cincinnati, Ohio, send us a circular showing the Pacific six hole range which they manufacture in styles to meet varying requirements. Attention is also called to the John Van range, which is referred to as still in the front rank. The family ranges made by the company consist of the Pacific, Atlantic, Plantation, Chimney Corner and the Maggie, all of which are adapted for burning various kinds of fuel and in the construction of which the company employ the best of material and workmanship. One of the features is their patent reversible grate, which is claimed to be economical, easily manipulated and most desirable in every way. The ventilated top plates and long centers of the ranges have an air chamber through which currents of air are constantly circulating, keeping them from warping and burning out as quickly as ordinary plates.

The J. F. Pease Furnace Company of Syracuse, N. Y., are enjoying a gratifying volume of business and state that their sales are very nearly up to those of last year. The company are running their works full up to 10 o'clock at night with the exception of Saturday. They are filling orders promptly and state that they are shipping more high-grade goods than usual.

Vice-President George H. Barbour of the Michigan Stove Company, who is a member of the World's Fair National Commission, representing Michigan, in connection with Hon. T. W. Palmer, takes a very great interest in exposition matters. Unlike many members of such bodies, he does not regard the position as merely honorary, but devotes himself to practical work. In consequence of this readiness to apply

his energy wherever needed, Mr. Barbour has earned decided prominence and gained national prestige. No little of his popularity is due to his cordiality and the tact with which he handles those who have occasion to meet him either in an official or unofficial capacity.

THE QUICK MEAL STOVE COMPANY, St. Louis, Mo., advise us of a shipment of a number of their new Process stoves to the Cherokee Strip, and also of the shipment of a carload of stoves to Los Angeles, Cal. Carload orders are very scarce just now, and especially of gasoline stoves, and it certainly indicates that the Quick Meal gasoline stove is still in demand notwithstanding the lateness of the season.

THE EXCELSIOR MFG. COMPANY, St. Louis, Mo., are distributing to their friends and customers interesting advertising matter relative to the goods which they manufacture. One of the circulars is unique, in that it is printed in *fac-simile* of hand writing upon common brown paper, the corners of the sheet being torn to indicate rough handling. Another circular refers to the approaching cold weather, and to the fact that during the past six weeks or two months very few stoves have been made owing to the shutting down of foundries. The company intimate that even if there is a moderate demand for stoves this season there will not be too many to supply the needs of the trade, owing to the fact that when the foundries closed stocks were not heavy. The Excelsior Mfg. Company state that they have a full assortment and a fair stock, and suggest to customers that they place their orders early before the rush begins so as to insure prompt shipment.

Gas Lighting, Heating and Cooking.

"THE MAN who lights Harlem" is the title selected by A. P. Mulvey, the manager of the Jos. P. Corney Gas Fixture Company, at 137 West 125th street, New York. The factory is in Brooklyn, but the main office has recently been located in larger quarters at the above address, where a fine show is made of chandeliers, hall lamps and brackets. One room set apart for lamps is called the art room, from the character of the goods displayed. Their wholesale trade covers a wide territory and the season approaching finds them busy filling orders.

THOSE WHO ARE in closest sympathy with the gas stove trade and the users believe that a stronger tendency is being developed toward the substitution of gas for coal entirely for cooking purposes.

THE GAS APPLIANCE EXCHANGE, at 37 West Fourteenth street, New York, is bringing heating goods to the front, but still have a fine line of gas cooking goods attractively displayed.

"THE FALL TRADE in gas stoves has not opened up yet, but we are ready with some nice heaters when it does," is the way Chas. Hetzel, Jr., Sixth avenue, above Fourteenth street, New York, speaks of the season.

E. K. CONANT, 9 West Fourteenth street, New York, is the agent for the Dangler Stove & Mfg. Company, of Cleveland, Ohio. He is issuing a 16 page pamphlet of the Dangler gas heaters for the coming season, with an invitation to "call and see the Dangler radiator before buying." The first half of the pamphlet is devoted to radiators, for which economy, efficacy and elegance are claimed. They say of the Dangler new style radiator: "This radiator is entirely new in principle. It is a base heater, taking the heat up through the center flue and returning it down to side flues, discharging it at the bottom, making the top hot, and the outpour from the bottom heats the floor, and persons can warm their feet as well as by a base-burning stove. The other pages are devoted to round and square open sheet-iron reflector and asbestos heaters. A carload of these goods are *en route* for the New York house.

LANDON KETCHUM, South Norwalk, Conn., has a fine line of his gas stoves attractively arranged at his main office, 23 West 125th street, New York.

THE DEALERS in gas stoves say that the proper thing in heating apparatus this fall seems to be radiators. These radiators consist of several sheet-iron tubes with an ornamental cast iron crown and base. As a rule, they burn with an illuminating flame, and some have mica windows.

A. J. DOTY of 2013 Fifth avenue, New York, has severed his connection with the Harlem Gas Appliance Exchange, and is now visiting the World's Fair to add to his wide knowledge of gas and gas appliances.

LUTHER & LEDERHOS, Cliff street, New York, have a very pretty gas radiator, known as Model No. 201.

ANNOUNCEMENT is made by the Shepard Hardware Company, Buffalo, N. Y., that they have sold and transferred to North Bros. Mfg. Company, Philadelphia, their Ice Cream Freezer business, including patterns, trade-marks, &c., and all orders for Freezers of the kinds formerly made by them, as well as repairs for the same, should be sent to the latter concern. North Brothers Mfg. Company state that they will be ready to furnish the full line of Lightning Freezers by December 1 next, and probably earlier than that date. In the manufacture of the goods the company will maintain the high standard of materials and workmanship which has distinguished these Freezers in the past. With this addition to their line the North Bros. Mfg. Company will undoubtedly occupy a conspicuous position as one of the leading manufacturers of Ice Cream Freezers in the country.

THE RECEIVERS OF WALLACE & SONS, Ansonia, Conn., and 29 Chambers street, New York, have issued an announcement to the trade, referring to the fact that owing to the financial stringency it was necessary for the company to go into the hands of receivers the latter part of August, and expressing their conviction that this condition of affairs will be only temporary. Meanwhile the receivers have started up the different mills and factories. A large stock of goods is on hand finished and ready to ship, so that orders from the trade can be executed promptly.

R. C. SNOWDEN, McKeesport, Pa., has been granted a patent on a strap for tin-plate boxes. These straps are formed in a press and made to fit the corner of a box, with nail holes punched and countersunk and the ends turned down to prevent them from catching on anything. The advantages of straps of some sort will be appreciated by those who are familiar with the dilapidated condition in which tin-plate boxes so often arrive.

Artificial Light.

We may sum up the advantages and disadvantages of electric light and gas light as follows, says an English exchange: Where powerful lights of great intensity are required, electric light would be preferable to gas light; but if the lighting consists of a great many small lights, gas may be preferable to the electric light because it is easily distributed without loss of energy. Objects are seen by electric light in their natural tints, while by gas light some colors cannot be distinguished at all, and others appear different. For chemical effects gas light is altogether impracticable. The electric light hardly increases the temperature in inclosed spaces, and products of decomposition injurious to health and inanimate objects are not formed; whereas gas raises the temperature considerably, and also causes the formation of carbon dioxide, compounds of sulphur, &c., which are injurious to health as well as to inanimate objects. Although the comparison of cost between electric light and gas light is of great importance, general rules are difficult to formulate, and the comparison must usually be made with special reference to the particular case under consideration. If a public supply of electric energy is available and glow lamps are used, it may be stated that at 6 pence per Board of Trade unit a 16 candle-power glow lamp is as cheap as a 5 cubic foot burner using ordinary gas at 6 shillings per 1000. When, however, the installation is sufficiently large to justify the putting down of special generating plant the comparison is much more favorable to the glow lamp. For purposes for which arc lamps can be used they are undoubtedly cheaper than gas. The adoption of the electric light will by no means do away with gas. This would, on the other hand, probably become more important than ever, although its form of utilization would possibly become altered. Using gas for heating purposes is a rational utilization of the coal, for during combustion of the gas the production of heat is far in excess of the production of light, which is proved by the heating of the air in closed spaces, and, still further, by the following statement: Large gas engines produce 1 horse-power by the consumption of 35.3 cubic feet of gas per hour. With such an engine, by using the electric arc light, a light of 1700 candle-power can be obtained; but if this quantity of gas is consumed by ordinary gas burners only seven flames of 16 candle-power each can be obtained—*i. e.*, a light of 112 candle power. It is, therefore, possible that the electric light may gradually take the place of gas, although the employment of gas will not become obsolete.

A computation made by *Engineering* shows that to patent an invention throughout the world costs nearly $14,000, there being 64 governments which have separate patent laws.

Mayor M. S. Harris of the city of Franklin, Ky., which has 25,000 inhabitants, wishes to correspond with companies that erect electric light plants and a system of water works.

TRADE REPORT.

The Iron Market.

While it is probable that manufacturers in different branches of the Iron and Steel trades have started to some extent on old orders, delivery on which had been previously postponed, it is true that the great majority of them are skirmishing about in a very lively fashion to secure additional work. Unless costs have been modified in a very extraordinary manner during the last three months, some sellers are going ahead without any reference to cost sheets. The actions of some of the largest producers seem to indicate that they do not hold any rosy views concerning the near future. They are taking business, wherever it is in sight, at unparalleled prices.

The easing of the money market may be said to be operating in two ways. It is causing the withdrawal from sale of some goods on which the banks had advanced, because those institutions, being able to carry them, believe the time for disposing of them unfavorable. Some manufacturers, however, are pursuing the opposite course because now they know that those to whom they sell can arrange for payment, which they could not do a few weeks since.

We note that there is being advanced, particularly by Southern furnacemen, an argument in support of a possible sharp advance this winter which deserves consideration. Our friends figure out that so little Lake Ore will be on hand at lower Lake ports at the close of navigation that it will not last until the opening of the season of 1894 Hence there will be a scarcity reflected in high prices, which will give Southern makers a chance to make a very substantial advance. Such a contingency could happen only if there were a very active trade in the fall and winter and if, particularly, the Steel Rail trade were to return to a normal condition.

Pig Iron.—There has been very little movement in the New York market, although the starting of a number of foundries is bringing some inquiry for small lots. It is probable, however, that in the majority of cases buyers avail themselves of postponed deliveries to cover their immediate requirements. The 5000-ton lot of Southern Iron which bankers were offering last week has been withdrawn, the pressure for money having probably become less, so that it is possible to await a more favorable period for disposing of the iron. Thus far only 300 tons of Southern Charcoal Iron have been announced to be sold at auction. We quote Northern brands $14 @ $15 for No. 1; $13 @ $14.25 for No. 2, at tidewater. Southern Iron, same delivery, $13.25 @ $14.25 for No. 1; $12.25 @ $13.25 for No. 2; $11.50 @ $12.25 for No. 3; $11.75 @ $12.25 for No. 2 Soft, and $12.25 @ $12.50 for No. 1 Soft.

The Philadelphia market for Pig Iron is reported as less favorable than might be expected, considering that the money panic is pretty well at an end. Although there is some demand, yet there are more sellers than buyers. The general tendency has been toward somewhat lower figures, and would probably be still more so if large lots could be moved for cash or for first class negotiable paper. As there is only a limited supply of these commodities, sellers content themselves with such business as they can get in small lots, and as near to quoted rates as possible, which for Philadelphia and equivalent points are usually about as follows: $12.50 @ $13, delivered, for Plain No. 2, $13.75 @ $14.25 for No. 2x and $14.50 @ $14.75 for No. 1x.

In the Chicago district inquiries are reported as being more numerous and the feeling as steadily growing better. Even consumers of Charcoal Iron are testing the market. Many of the inquiries now received are contingent on the starting up of foundries. The foundrymen are hopeful that they will soon have sufficient work to resume operations, and in that event a great deal of Iron will have to be purchased. The resumption of operations by the Agricultural Implement works will make shipments heavier within the coming month. This is also expected to influence the Charcoal Iron market, as a good demand will then be thrown on the Malleable works, which have for some time been doing but little. Quotations are now as follows for cash:

Lake Superior Charcoal	$16.00 @ $16.50
Local Coke Foundry, No. 1	13.50 @ 14.00
Local Coke Foundry, No. 2	12.75 @ 13.00
Local Coke Foundry, No. 3	12.50 @ 12.75
Local Scotch	14.00 @ 14.50
Ohio Strong Softeners No. 1	15.50 @ 16.00
Southern Silvery, No. 1	@ 14.50
Southern Silvery, No. 2	@ 14.00
Southern Coke, No. 2	12.35 @ 12.60
Southern Coke, No. 3	11.60 @ 11.85
Southern, No. 1, Soft	12.35 @ 12.60
Southern, No. 2, Soft	11.85 @ 12.10
Tennessee Charcoal, No. 1	16.00 @ 16.50
Alabama Car Wheel	18.50 @ 18.75
Hocking Valley, No. 1	15 25 @ 16.00
Jackson County Silvery	16.00 @ 17.00

The demand for Pig Iron in Southern markets has kept up fairly well. Sales are reported aggregating about 15,000 tons, largely for stove works and for purposes presumed to be for mixing and for Pipe works. The prices which have been obtained were $7.50 for No. 3 Foundry, f.o.b. Birmingham, and these prices, with $8.25 fo No. 2 Foundry, seem still to find sellers, for when more has been asked sales could not be effected, although it seems probable that about all of the Iron obtainable at these low prices has been closed out; at any rate, it is certain that many furnaces in the South will not entertain further bids except at an advance of 25¢ ℔ ton. There is a pretty liberal number of orders for single carloads of Pig Iron passing, and there is an enlargement in the demand from the East for various kinds of Iron. There are more inquiries for long forward delivery, but the furnaces are not disposed to entertain them except at such an advance in price as prohibits trading. There is no movement in Charcoal Iron; in fact, there is not much trading in other leading kinds of Southern Coke Iron. The undertone seems to be strengthening and an advance must take place if the demand keeps up. Quotations as follows:

Foundry.

Southern Coke, No. 1	$12.75 @ $13.00
Southern Coke No. 2	10.75 @ 11.00
Southern Coke No. 3	10.25 @ 10.50
Ohio Soft Stone Coal, No. 1	15.50 @ 16.00
Ohio Soft Stone Coal, No. 2	14.50 @ 14.75
Lake Superior Coke No. 1	15.00 @ 15.25
Lake Superior Coke No. 2	14.00 @ 14.25
Hanging Rock Charcoal, No. 1	18.50 @ 19.00
Hanging Rock Charcoal, No. 2	17.50 @ 18.00
Tennessee Charcoal, No. 1	14.00 @ 14.25
Tennessee Charcoal, No. 2	13.00 @ 13.25

Car Wheel and Malleable Irons.

Standard Southern Car Wheel	17.75 @ 18.00
Lake Superior Car Wheel and Malleable	17.00 @ 17.25

Metal Market.

Pig Tin.—The past week has witnessed a further advance of about ½¢ ℔ lb in the price of Straits Tin, and the tone of the market looked stronger than at any previous time since the inauguration of the upward movement. First hand stocks are being steadily reduced at the rate of at least 1200 tons per month, and the quantity unsold in the United States, exclusive of the Pacific Coast, is now between 4500 and 5500 tons, or say equivalent to about four months' consumption. In a speculative way there have been only moderate dealings of late and interest is by no means lively at the present time. Such as it is, the trading is between regular operators. At the close of the week the market was very firm, with sales at 20.50¢ @ 20.55¢ for prompt delivery and 20.70¢ for October. Bids quite as high were made subsequently in the face of lower quotations from London. Straits shipments first half of September were 1075 tons to Great Britain and 400

tons to Continent, against a total of 305 tons during the corresponding period last year. Jobbers' prices for small lots remain unchanged, with a fair demand.

Copper.—No further change in prices has taken place and the market apparently retains very firm tone. Home trade buying seems to be very commonplace, with the amount of Copper involved only fair, but home deliveries and exports together take up enough stock to keep the statistical position good. Lake Superior Ingot is quoted at 9⅞¢ @ 10¢, according to brand and terms of sale. Retail demand is fair; orders and inquiries for moderate lots show considerable activity, but little or no demand exists for larger quantities than are needed for present requirements. Prices are firm at former quotations, namely: Lake Ingot, 11¢; Ansonia grade Arizona, 10½¢; Ansonia grade Casting, 10¢.

Sheet Copper.—There is quite a good volume of business moving in this material, mainly in orders for moderate quantities. Small dealers and consumers throughout the country are carrying little or no stocks beyond what is absolutely needful for present requirements, constantly all orders are accompanied by a request for prompt shipment. Prices incline to harden, although quotations for small lots remain unaltered.

Pig Lead.—Dealings in this metal have been on a moderate scale, and the demand has shown some falling off also, while prices are a shade easier. Thus against 3.85¢ bid a short time ago there have been sales recently at 3.80¢ for October delivery, while 3.85¢ stands as a common asking price at the moment for deliveries running during the balance of the year. For small lots dealers are asking an advance of ⅛¢ @ ¼¢, or 4¼¢ @ 4⅜¢ for American Pig, and 4⅜¢ for Bar Lead. The retail demand is light. There appears to be no prospect of any material revival in the near future.

Lead Pipe and Sheets.—The consumptive demand for manufactured Lead is only of a slight nature. The abandonment or postponement of building operations in many quarters, owing to the difficulty experienced by contractors in obtaining monetary accommodation, has materially reduced the ordinary volume of fall business. It is not believed that much activity will be experienced in the demand for Plumbers' Supplies until next spring. Prices continue unchanged, in view of the reduced demand for Lead Pipe and Sheets, which makes any present advance impossible.

Spelter.—The market is wholly unchanged. Dealings have been moderate and chiefly at last week's prices, while buyers' and sellers' ideas of value have remained stationary. Fair quotations would appear to be about 3.75¢ @ 3.80¢ for ordinary Western brands, with the usual premium on choice brands. For small lots Western spelter still 4¼¢ @ 4⅜¢.

Tin Plates.—The principal feature of the local Tin-Plate market during the week has been some liberal purchases of spot Cokes for the Baltimore oyster packers, which have caused a larger movement in these Plates than has been experienced for some months. It is said that certain sizes of imported Cokes are becoming scarce in consequence, and on these the price has hardened, with a tendency to advance. In other lines a fairly good jobbing movement is noted in Ternes and Charcoals. Jobbers' orders, which have increased in number, are mainly for moderate quantities and spot delivery. Futures are still neglected. The aggregate of orders for the week, although hardly up to a fair average for the season, shows, however, a marked advance in demand over the last few months. Orders for future shipments from Europe are very light, and until some thing definite is known as to the trend of tariff legislation importers are unlikely to stock up with imported Plates to any extent. Prices, while unchanged, are inclined to stiffen in most lines of Plates, and concessions are harder to obtain than has been the case for some months past. Altogether a better feeling exists, and collections are reported as distinctly easier, while it is noticed by jobbers that small orders are often repeated by the same purchaser, showing that although consumers are unwilling to load up with any unnecessary stock, there is a healthy consumptive demand going on all the time. This keeps the trade moving, and promises that when the business situation is once more settled a good, strong market will develop.

Sheet Iron.—Prices on Black Iron are inclined to stiffen, owing to a rather better demand and reductions in stocks of certain sizes. The output is, however, increasing by the resumption of operations in some mills, and it is unlikely that any scarcity will occur. Galvanized Sheets are becoming scarce, and manufacturers are reported as unable to fill all the orders received at the mills. Prices continue firm, but there is no sign as yet of any advance in the price-list. This may, nevertheless, take place before long unless the output of Galvanized Iron is materially increased.

THE ROCHESTER RADIATOR COMPANY, Rochester, N. Y., send us a 12-page circular relating to the Rochester Radiator, for which many claims are made. This device is intended to increase the capacity of the stove in connection with which it is employed, and also to heat an adjoining or upper room, as the case may be. This radiator is illustrated and described in the pamphlet before us, while extracts from testimonial letters show the satisfaction which the radiator has given to those who have used it.

Chicago Report.

Scrap.—The inquiries from distant buyers reported last week have not led to business, and the outlook is discouraging for dealers in Old Material. They offer the following rates, Chicago delivery, to country collectors:

	Per net ton.	Per lb.
No. 1 Wrought Scrap	$7.00	....
Machinery Cast	6.00	....
Malleable Cast	5.00	....
Stove Plate (free of burnt)	4.00	....
Burnt Iron and Grate Bars	3.50	....
Sheet Iron and Hoops	2.00	....
Plow Steel and Breaking Stock	5.00	....
No. 2, such as Shovels, Hoes, &c	4.00	....
Old Boilers—whole (Iron)	4.00	....
" (Iron)—cut in single Sheets and Rings	6.00	....
Old Gas-Pipe and Boiler Tubes	5 00	....
Cast Borings	3 00	....
Turnings	4 00	....
Horseshoes	8.00	....
Copper Bottoms	....	5 ¢
Copper Clips and Heavy	....	6 ¢
Heavy Brass	....	5½¢
Light Brass	....	3½¢
Pipe Lead	....	2 1-10¢
Tea Lead	....	2 ¢
Zinc	....	2 ¢
Rubber	....	2 ¢

Anthracite.—A good business is reported by the large dealers. Carload lots of 12 net tons or over are quoted as follows:

	Grate.	Egg, Sto. and Ch.
Chicago, Ill	$5.85	$6.10
Milwaukee, Wis	5.85	6.10
Kansas City, Mo	9.05	9.30
Council Bluffs, Iowa	9.05	9.30
Lincoln, Neb	9.20	9.45
Sioux City, Iowa	9.05	9.30
Aberdeen, S. Dak	9.10	9.35
Dubuque, Iowa	7.15	7.40
Madison, Wis	7.35	7.60
St. Paul, Minn	8.35	8.60
Burlington, Iowa	7.35	7.60
Des Moines, Iowa	8.80	9.05
Davenport, Iowa	7.15	7.40
St. Joseph, Mo	9.05	9.30
Leavenworth, Kan	9.05	9.30
Omaha, Neb	9.05	9.30

Colorado Anthracite.

COLORADO FUEL & IRON COMPANY.

Denver	$8.00
Pueblo	8.00
Colorado Springs	8.00
Leadville	8.00
Cheyenne, Wyo	10.00
All points between Denver and Missouri River	9.35

THE TIN CAN FACTORY of Sylvester Ruth & Son, Baltimore, Md., was burnt out last week, the loss amounting to $8500. It will be rebuilt at once with a new outfit of machinery.

THE JOSEPH DIXON CRUCIBLE COMPANY, Jersey City, N. J, issue a little leaflet which they entitle "The Cost of a Lead Pencil." They explain that the cost in a lead pencil is not the way it is finished, or the wood, or the stamping or the varnishing, but the time and labor spent in manipulating the material of which the leads are made.

BERGER BROTHERS, 237 Arch street, Philadelphia, Pa., make an announcement of particular interest to architects and tin roofers. The advertisement relates to their Eave-Trough Hangers and Pipe Fasteners, illustrations of which are shown in the announcement and some particulars are given in the text.

THE PHELPS METAL COMPANY have organized at Syracuse, N. Y. They will manufacture Cutlery and Hollow Ware. The capital stock is $50,000.

CONDITION OF THE

Hardware Trade.

REPORTS FROM THE leading markets of the country indicate an improvement in business. While trade has not assumed the usual volume, there is a fair degree of activity and a good many orders are being placed. While these orders are carefully assorted and cover only such goods as are demanded by the immediate requirements of business, their aggregate is considerable. It is noticeable that many of the jobbing houses are replenishing their stocks with a little more freedom than heretofore. There is, however, no evidence of a disposition to buy beyond the early requirements of trade, and merchants are still conducting their business very conservatively. Many more travelers are on the road than a few weeks ago, but there are not as many out as usual, most manufacturers and jobbers conducting their business with especial care and economy, and refraining from keeping on the road travelers whose business does not justify the expenditure. Advices from the retail trade indicate a preceptible improvement in business since the opening of the month, and it is pleasant to note that in many sections business is referred to as nearly if not quite as good as usual at this season. The extent to which building is affected by the recent financial troubles is illustrated in statistics which have recently been published relating to the building departments of New York and Brooklyn, which show that exceptionally few new buildings have been projected during the past two or three months. From July 8 to September 9, 1892, permits for 468 new buildings were issued in New York and 903 in Brooklyn, making a total of 1371, while during the present year, in the same period, the number of permits issued in New York was 290 and in Brooklyn 358, making a total of 648—a decline of more than 50 per cent. There has also been a marked decrease in the estimated cost of the buildings projected. There has probably been a similar falling off in building enterprises in many other cities, and perhaps throughout the country at large, the effect of which on trade cannot fail to be felt. Manufacturers are availing themselves of the improvement in business and are pushing sales more vigorously than during the past two months, and their solicitude for business results in some cases in slightly lower quotations. Prices on the whole, however, are pretty well maintained. Collections show a very satisfactory improvement, and there is much less complaint on this score than a few weeks ago. The delay of action in the Senate in regard to the repeal of the Sherman law is having some disquieting effect in financial and mercantile circles, but it is hoped that under the pressure of public sentiment the repeal act may be passed without much further loss of time.

Advices from Chicago.—The Shelf Hardware jobbers report a continued excellent demand for seasonable goods, which brings the volume of business up close to the usual fall trade. General Hardware, however, is moving out very slowly, and there is some apprehension that as soon as the trade in season goods it over there will be another period of dullness in this line. This view, however, is not entertained by all jobbers, some being hopeful that there will be good business up to the close of the year. The tinware houses report a better demand for goods of that character, but specialties in the dairy line are very quiet, owing to the bad condition of pastures. The Heavy Hardware trade is quite good in Iron and Steel, but not in other departments. The wagon and carriage builders are still buying very sparingly, and the outlook in that direction is not very encouraging. Manufacturers' agents have had a notable increase in their trade the past week. Collections are fair, very little complaint being heard on that score.

Notes on Prices.

Wire Nails.—There has been a good degree of activity in the Wire Nail market and most of the mills are well occupied on orders. Their business has been for the most part in lots of moderate size, there not being a disposition on the part of the largest purchasers to order more Nails than are sure to be required in the near future. The buying is thus limited to the necessities of the trade and an entire absence of speculative spirit is noticeable. There is some unevenness in prices and the market gives indications of weakness. Some of the manufacturers are disposed to hold pretty firmly to the quotation of $1.50, but the greater part of the business has been at lower figures. As a general quotation $1.45 to $1.50 may be named for ordinary lots, but the lower figure is shaded under pressure. Small lots from store in New York are quoted at $1.60 to $1.65.

Advices from Chicago.—Wire Nails are weaker from factory, notwithstanding a better demand. Plenty of orders are being booked, but by those who are making the lowest prices. The manufacturers are now selling lots of 400 or 500 kegs at the price they would ordinarily ask for very large quantities. Quotations from factory are in the neighborhood of $1.45, Chicago, but this is shaded to the best trade. Jobbers continue to quote small lots at $1.50 to $1.60, but their prices are not so firm as they have been.

Cut Nails.—The Cut Nail market, on the whole, is devoid of specially new features, and there is but little improvement in the demand to report. Transactions are limited to the immediate requirements of the trade. Prices also continue without material change, but there is, perhaps, an undertone of weakness perceptible, and it is not unlikely that an attractive order for prompt cash could be placed at low figures. Small lots from store in New York are held at $1.25 to $1.30.

Advices from Chicago.—Business in Cut Steel Nails is improving steadily, and September will show a much better trade for manufacturers than August. Inquiries are being received from a little wider territory now than last week, showing that the improvement is covering a larger field. Prices are unchanged, factory lots being quoted at $1.20 @ $1.25, Chicago and small lots from stock, $1.30.

Barb Wire.—An increase in inquiries for Barb Wire is reported and also some improvement in the demand. The market is in substantially the same condition as regards price, and quotations are on the basis of $2.40 to $2.45, for carload lots at mill of Four Point Galvanized. It is understood that these figures are slightly shaded in special cases.

Advices from Chicago.—Manufacturers of Barb Wire report a fair demand, which is perhaps a trifle larger than a week ago, with indications of further improvement. Jobbers are also having a better trade from all parts of the territory reached from this center. Factory lots are quoted on the basis of $2.45 to $2.50 for Galvanized and small lots from stock $2.60.

Bradley's Shelf Brackets.—The Atlas Mfg. Company have added a 10 x 12 inch size to their line of Steel Shelf Brackets. The list of this size is $6 a pair, subject to a discount of 70 and 10 per cent. They also advise us that they are putting heavier wire and steel into the goods than heretofore.

Cordage.—A fair but not heavy business in Cordage is reported. Stocks in the hands of many dealers are low, as a result of the condition of things in mercantile and financial circles for the past few months. More inquiry and an increase in business is, however, reported. Prices continue without change and with perhaps a slightly weaker tone, which does not, however, call for a change in quotations, which are on the following basis:

	Base.
Manila	$0.08
Sisal	.06½
New Zealand	.06¼

The above figures are for large lots at factory or New York. On smaller lots, such as are usually purchased by the trade, slight advances are made.

Sheet Zinc.—Under date September 12 Matthiessen & Hegeler Zinc Company, La Salle, Ill., issue another price-list and discount sheet of Sheet Zinc, quoting the advanced price of $4.25 per 100 pounds is announced for Sheet Zinc in 600-pound casks, of the thickness between Nos. 9 and 15, inclusive, and of the widths between 32 and 46 inches,

and of the lengths between 84 and 90 inches.

They also announce the following revised extras, in cents per 100 pounds:

Nos.	5	6	7	8	9	10	11	12	13	14	15
32 to 40 x 84	35	20	15	05	..	.....	.....	.....	.....	.....	.....
32 to 46 x 84 to 90	....	....	....	....	none	none	none	none	none	none	none
52 x 84	....	....	105	45	40	30	20	20	20	20	25
50 x 84	....	....	70	....	25	15	10	10	10	15	15
48 x 108	...	...	55	40	35	25	10	10	10	15	15
48 x 96	....	....	45	20	20	10	10	10	10	10	10
48 x 84	115	60	40	15	10	05	05	05	05	05	05
36 x 108	75	65	35	20	20	15	10	10	10	10	10
36 x 96	60	30	20	10	10	05	05	05	05	05	05
30 x 84	50	30	25	10	10	05	05	05	05	05	05
28 x 84	55	35	25	15	10	10	10	10	10	10	10
26 x 84	65	40	35	20	15	10	10	10	10	10	10
24 x 84	70	50	40	10	10	05	05	05	05	05	05

The extra on No. 4 36 x 84 is $0.60 per hundred pounds.

The charges for small lots and the discounts are the same as announced in the circular referred to in our last issue.

Glass.—There is an improvement noticed in the Glass trade, demand being somewhat greater and prices firmer. This is the season for placing orders for Glass, and with no home production and a limited quantity of imported Glass coming into the country, stocks are not as well assorted as could be wished. There is no immediate prospect of American factories going into operation. Indiana and Kentucky have been declared by the National Window Glass Company an open market, as manufacturers in these States felt they were not getting their share of the trade. It is stated in this connection that these manufacturers have disposed of their best Glass, so that this departure is not likely to affect the price of Glass in other hands. Some of the Plate Glass factories have gone into operation to replenish their depleted stocks. Prices remain unchanged on all lines of Glass.

Old Metals.—The market for Old Metals has been dull during the past week. Prices are irregular, and can only be quoted approximately. The demand for Scrap Iron has been disappointing, and prices begin to show signs of weakness. Asking rates are usually about as follows, but these are said to have been shaded where sales were imperative:

Heavy Copper	℔ 6¾¢
Light and Tinned Copper	℔ 6¼¢
Heavy Brass	℔ 5¼¢
Light Brass	℔ 4½¢
Lead	℔ 2¾¢
Tea Lead	℔ 2½¢
Zinc	℔ 2½¢
No. 1 Pewter	℔ 14¢
No. 2 Pewter	℔ 6¢
Wrought Scrap Iron, ℔ gross ton	$13.50 @ $14.50
Heavy Cast Scrap, ℔ gross ton	12.00 @ 13.00
Stove Plate Scrap, ℔ gross ton	7.00 @ 8.00
Burnt Iron (delivered at mill) ℔ gross ton	5.00 @ 6.00

Old Rags, Paper, &c.—The market for Old Rags, Paper, &c., has sagged off somewhat during the week, and presents a less promising aspect than was the case at the beginning of the month, due mainly to the general condition of uncertainty now existing. Paper mills are said to be well stocked up, and their operations are being carried out on a basis of caution pending the results of future financial and tariff legislation. Quotations are about as follows, delivered in New York:

No. 1 White Rags	℔ 3¼ @ 3½
No. 2 White Rags	℔ 2⅝ @ 2¾¢
Mixed Rags	℔ ¾¢
Blues and 3ds	℔ 1 @ 1¼¢
Hard Sized White Shavings	℔ 2¼¢
No. 1 White Book Shavings	℔ 1¾ @ 2 ¢
No. 2 White Book Shavings	℔ 1 @ 1⅛¢
Light Book Shavings	℔ ⅝¢
No. 1 Mixed Shavings	℔ ¾¢
No. 2 Mixed Shavings	℔ ½¢
No. 1 Printed Books	℔ 1 ¢
Ordinary Mixed Books	℔ ⅓ @ ⅝¢
Newspapers	℔ 3-5¢
No. 1 Manila Paper	℔ ⅞ @ 1 ¢
No. 2 Manila Paper	℔ ⅝ @ ¾¢
Bogus Paper	℔ ½¢
Common Paper	℔ ⅜ @ ½¢
Straw Chips	℔ ⅓ @ ⅜¢
Binders' Clippings	℔ ⅓ @ ⅜¢
Jute Butts	℔ 1⅛ @ 1¼¢
No. 1 Jute Bagging	℔ 1 ¢
Mixed Bagging	℔ ¾ @ 1 ¢
No. 2 Bagging	℔ ½ @ ¾¢
Hemp Twine	℔ 2¼¢
Manila Rope	℔ 2½¢
Jute Rope	℔ 1½ @ 1⅞¢
Mixed Rope	℔ ¾ @ ⅞¢

Old Rubber.—There is no change in the market for this material, which continues sluggish. The following quotations represent approximately the prices now ruling, New York delivery:

Car Springs, ton lots, ℔ lb.	@ $0.03¼
Rubber Shoes, carloads, delivered at factory, ℔ lb.	@ .03
Rubber shoes, less than carloads, ℔ lb	0.02¼ @ .03⅛
Large Hose, ℔ ton	@ 9.00
White Wringer Rolls, ℔ lb.	@ .04¼
White Syringes, ℔ lb.	@ .05

Trade Notes.

L. L. Rowe, 18 Howard street, Boston, Mass., is showing to the trade this season his well-known specialties, which include Rowe's Pipe Crimper, which, it is claimed, will crimp the lightest tin and No. 18 iron, and Rowe's Improved Furnace Regulator, a device for automatically regulating furnace heat.

Curtis & Curtis, Bridgeport, Conn., issue a circular illustrating and describing Brock's Patent Chain Pipe Wrench. A table of dimensions and prices is also presented on the sheet.

The galvanizing plant of the Cambridge Iron & Steel Company, Cambridge, Ohio, was put into operation last week. Very satisfactory results of the trial run are reported. These works are equipped with patented machinery, which is said to work perfectly.

Owing to the rapidly increasing orders the La France Engine Company of Elmira, N. Y., are about to extend their plant by the addition of a coppersmithing shop 42 feet square. A large amount of tools has been purchased, and the increase in the capacity of the works will probably give employment to 10 or 12 new men from the start.

At the annual election of the New York Wire Cloth Company, held recently, L. H. Root of Hamilton, N. Y., was elected president; J. Maus Schermerhorn of New York, vice-president, and F. W. DeWitt, treasurer.

The works of the St. Louis Stamping Company, St. Louis, Mo., have resumed activity. The works, when in full operation, employ about 2000 hands, who have been idle for the past two months.

The Eastern Tinware Company's factory, at Portland, Conn., is again in operation, working 40 hours per week.

The Columbia Can Machine Company have been organized at Saco, Maine, for the purpose of manufacturing and dealing in Cans of all kinds, together with tools and materials used in such manufacture, with $250,000 capital stock. The officers are: President, Clinton M. Dyer of Worcester, Mass.; treasurer, Charles F. Sanborn of Cambridgeport, Mass.

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Metal and Miscellaneous Prices.

CHICAGO, SEPTEMBER 21, 1893.

Tin—
Straits pigs.....22½¢

Imported Tin Plates—
Charcoal Plates.—Bright.

Guaranteed Plates command special prices, according to quality.

		Per box.
Calland and Melyn Grade	IC, 10 x 14	@ $6.75
	IC, 12 x 12	@ 6.75
	IC, 14 x 20	@ 6.75
	IC, 20 x 28	@ 13.50
	IX, 10 x 14	@ 8.75
	IX, 12 x 12	@ 8.75
	IX, 14 x 20	@ 8.75
	IX, 20 x 28	@ 17.50
	DC, 12½ x 17	@ 6.50
	DX, 12½ x 17	@ 8.50
Allaway Grade,	IC, 10 x 14	@ 6.50
"	IC, 12 x 12	@ 6.50
"	IC, 14 x 20	@ 6.50
"	IC, 20 x 28	@ 13.00
"	IX, 14 x 20	@ 8.00
"	IX, 20 x 28	@ 16.00

Coke Plates—Bright.

	Per box.
Steel Coke—IC, 10x14.14x20.	$5.85 @ $6.00
IC, 14x20.90 ℔	5.60 @ 5.75
IC, 14x20, 100℔	@ 5.85
10 x 20	8.75 @ 9.00
20 x 28	11.70 @ 12.00
X, 10x14, 14 x 20	@ 7.50
B.V. Grade. IC, 10x14, 14x20.	5.85@ 6.00

Charcoal Plates.—Terne.

Guaranteed Plates command special prices, according to quality.

Mansel and Dean Grades.—

IC. 14 x 20	@ $5.62½
20 x 28	@ 11.25
IX. 20 x 28	@ 14.25

Worcester Brand and equal.—

IC, 14 x 20	6.12½@
IC, 20 x 28	12.25 @
IX, 14 x 20	7.62½@
20 x 28	15.25 @

American Tin Plates.
Charcoal Plates.—Bright.

Irondale, A. A.—	IC, 14 x 20	$7.00
" "	IX, 14 x 20	9.00
" "	IXX, 14 x 20	11.00
" "	IC, 20 x 28	14.00
" "	IX, 20 x 28	18.00
" "	IXX, 20 x 28	22 00
Florence.—	IC, 10 x 14, 12 x 12, 14 x 20	$6.75
	IX, 10 x 14, 12 x 12, 14 x 20	8.50
Palma.—	IC, 10 x 14, 12 x 12, 14 x 20	$7.25
	IX, 10 x 14, 12 x 12, 14 x 20	9.25

Each extra cross $2.00 and 20 x 28 double these prices.

Brilliant, Tissue Packed, IC, 14 x 20.	$9.25
Royal, extra, IC, 14 x 20	7.25
Merion, IC, 14 x 20	7.00
Almond, IC, 14 x 20	6.50
Mint, IC, 14 x 20	6.25

Coke Plates.—Bright.

Elwood.—IC, 14 x 20	$6.00
" IC, 20 x 28	12.50

Roofing Plates.

Arch, IC, 20 x 28	@ $11.75
Crescent, IC, 20 x 28	@ 12.25
Crescent, IX, 20 x 28	@ 15.25
Empire, IC, 20 x 28	@ 12 50
Empire, IX, 20 x 28	@ 15.50
Hickory, IC, 20 x 28	@ 12.75
" IX, 20 x 28	@ 15.75
Alaska (heavily coated), IC, 20x28	@ $14.50
Alaska IX, 20 x 28	@ 17.75
Special, IC, 20 x 28	@ 15.50
" IX, 20 x 28	@ 18.50
Merchant's Roofing (extra coated), IC, 20 x 28	@ $17.75
Merchant's Roofing (extra coated), IX, 20 x 28	@ $21.50
Merchant's Old Method, (extra heavily coated), IC, 20 x 28	@ $19.75
Merchant's Old Method (extra heavily coated), IX, 20 x 28	$23.60
Irondale A: IC, 14 x 20	$6.25
IX, 14 x 20	7.75
IC, 20 x 28	12.50
IX, 20 x 28	15.50
Westmoreland: IC, 14 x 20	$6.25
IC, 20 x 28	12.50
Elwood: IC, 20 x 28	$12.00
Juno: IC, 14 x 20	$5.75
IC, 20 x 28	11.50
Illinois, Old Method: IC, 20 x 28	$17.00
E. L.: IC, 20 x 28	$12.50
Jessie: IC, 20 x 28	$12.00
Scott's Extra Coated, Stamped and Resquared, IC, 14 x 20	$9.50
Scott's Extra Coated, Stamped and Resquared, IX, 14 x 20	11.00
Scott's Extra Coated, Stamped and Resquared, IC, 20 x 28	19.00
Scott's Extra Coated, Stamped and Resquared, IX, 20 x 28	22.00
Neville, Stamped, IC, 14 x 20	6.25
" " IX, 14 x 20	7.50
" " IC, 20 x 28	12.50
" " IX, 20 x 28	15.00
Taylor's Old Style, IC, 14 x 20 (Stamped and Resquared)	$9.50
Taylor's Old Style, IC, 20 x 28 (Stamped and Resquared)	19.00
Taylor's Roofing, IC, 14 x 20 (Stamped and Resquared)	8.25
Taylor's Roofing, IC, 20 x 28 (Stamped and Resquared)	16.50
Columbia, IC, 14 x 20 (Stamped)	7.25
" IC, 20 x 28 (Stamped)	14.50
Maple, IC, 14 x 20 (Stamped)	6.75
" IC, 20 x 28 (Stamped)	13.50
Willow, IC, 14 x 20	6.50
" IC, 20 x 28	13.00
Knoxall, IC, 14 x 20	6.25
" IC, 20 x 28	12.50
Globe, IC, 14 x 20	6.00
" IC, 20 x 28	12.00
Miami, IC, 14 x 20	6.00
" IC, 20 x 28	12.00
" IX, 20 x 28	15.00
" (Redipped), IC, 20 x 28	17.00

Tin Boiler Plates.

	Per box of 100 sheets.	Per box of 112 sheets.
X, 14 x 28	$13.00	$13.00
XX, 14 x 28	14.50	14.50
X, 14 x 31	14.50	15.80
XX, 14 x 31	16.50	17.50

	Per box of 56 sheets.	
X, 14 x 56	29.50	16.50
XX, 14 x 56	32.50	18.20
X, 14 x 60	31.50	17.65
XX, 14 x 60	35.50	20.90

Sheet Iron—
Black.

	Common American	Refined.
Nos. 10 to 16	₩ ℔ 2 7-10¢	3 3-10¢
17 to 20	₩ ℔ 2 8-10¢	3 4-10¢
21 to 24	₩ ℔ 2 9-10¢	3 5-10¢
25 and 26	₩ ℔ 3¢	3 6-10¢
27	₩ ℔ 3 1-10¢	3 7-10¢

Russia, Planished, &c.

Genuine Russia, all numbers....13¢ net.
Patent Planished....₩ ℔ A, 10¼¢; B, 9½¢ dis. 5%

Galvanized.

Juniata or first quality.....dis. 70&5%

Copper—
Ingot.

Lake.....11⅝¢ @ 12¼¢
Casting Brands.....11¢ @ 11¾¢

Sheet and Bolt.

Discount, 25%.

Copper Bottoms.

Discount, 25%.

Seamless Brass and Copper Tubes.

Base price, 17½¢, Chicago, with extras according to size.

Copper, Bronze and Gilding Tube, 3¢ ₩ ℔ additional.

Brazed Brass Tubing.
(To No. 20 inclusive.)

Add freight from New York to Chicago to these prices, or 50¢ ₩ 100 ℔.

Above 5-16 inch to 3 inch inclu.	35¢
Plain, above 3 inch	45¢
Plain, 5-16 inch	45¢
Plain, ¼ inch	60¢
Plain, 3-16 inch	$1.00
Plain, ⅛ inch	$1.50
Fancy Tubing, Brass, to No. 20 incl.	43¢ ℔
Bronze Tubing, 3¢ ₩ ℔ more than Brass	

35 @ 40%

Roll and Sheet Brass.

Discount, 35 @ 40%.

Slab Spelter—
Western Spelter.....5

Sheet Zinc—
600 ℔ casks.....6¼¢
300 ℔ casks.....6½¢
Loose sheets.....6¾¢

Lead—
Soft Pig Lead.....4½¢
Bar.....4.60¢@5¢
Pipe.....5½¢, dis. 10¢
Block Tin Pipe.....35¢
Sheet.....6¢, dis. 10%

Solder—
½&½c.....13¢@13¼¢
Extra Wiping.....11½¢

The prices of the many other qualities of Solder in the market indicated by private brands vary according to composition.

Antimony—
Cookson.....12½@12¾¢
Hallett's.....11¼¢@11¾¢

Wrought-Iron Pipe—
List on following page.

1¼ and under, Plain	57½&10%
1¼ and under, Galv	52½&10%
1½ and over, Plain	67½&10%
1½ and over, Galv	60&10%
Boiler Tubes, list Oct. 24, 1892	65@67½%
Casing, list Nov. 16, 1892	52½%
Inserted Joints Casing, list Nov. 16, 1892	47½%
Steel Boiler Tubes	27½%
Cold Drawn Seamless Steel Tubing	50%

Cast-Iron Soil Pipe—
Cast-Iron Soil-Pipe, Tarred; sizes 2 to 6 inches, inclusive.....dis 70&2½%
Other sizes.....dis 60%

Leader Pipes—
Abendroth's Galv. Spiral Riveted.....60%
Austin's Corrugated.....60%
Gordon & Gilbert's Corrugated.....60%
Ritchie's (Galv. Iron only) Cor'd.....60%
Ritchie's Spiral Lock Seam, Galv'd.....51%
Austin's Spiral Ribbed Pipe.....60%
Plain Adjustable Elbows.....60%
James A. Miller Bros. (Galv'd Iron only) Corrugated.....60%

Furnace Fittings—
Discount from Excelsior Steel Furnace Co.'s list.....50%

Steel Roofing—
Perfection.....$3.75 square
Climax.....$3.50 square
The Lloyd Spanish Tiling.....$4.50 square

Metallic Shingles—
Cushman's.....$1.25 square
Merchant & Co.'s Spanish Tiles:
Copper, 14 oz.....$36.00 square
Tin.....$9.75@$14.25 square
Steel, painted.....$9.00 square

Drain Pipe—
Discount from list.....50%

Paints, Oils, &c.—
Deodorized Benzine.....7½@8 ¢
Iron Paint, Bright Red.....₩ ℔, 2 ¢
" " Brown.....₩ ℔, 1½¢
" " Purple.....₩ ℔, 2½¢
" Ground in oil, B. Red ₩ ℔, 6½¢
" Ground in oil, Red..₩ ℔, 6½¢
" Ground in oil, Brown ₩ ℔, 6½¢
" Ground in oil, Purple ₩ ℔, 6 ¢
Linseed Oil, Boiled, in bbls.....53¢
Linseed Oil, Raw, in bbls.....50¢
Mineral Paints.....2@4¢
Orange Mineral.....10¾¢
Pure White Lead in Oil.....6¾@7¾¢
Dry White Lead in bbls.....6½@6¾¢
Red Lead, American.....7@7½¢
Red Venetian, English, dry...$1.65@$1.70
Red Venetian in oil; asst'd cans, 8½¢; kegs.....7½¢
Sipe's Japan Oil, in bbls, ₩ gal.....34¢
Spirits Turpentine, in bbls., ₩ gal..32½¢
Asphaltum, Trinidad Refined, ₩ ton..$45
Tarred Felt, 1 Ply, ₩ 100 ℔.....$1.65
Tarred Felt, 2 Ply, ₩ roll 108 sq. feet.....$1.50
Tarred Felt, 3 Ply, ₩ roll of 108 sq. feet.....$2.00
Roofing Pitch, ℔ bbl. of 300 ℔.....$3.20

NEW YORK, SEPTEMBER 22, 1893.

The following quotations are for small lots.

Aluminum—
No. 2 Grade Metal, in ton lots..₩ ℔, $0.75
No 1 (guaranteed to be 98 % pure and over), in ton lots.....₩ ℔ .90
Lots less than 1 ton, 10¢ ₩ ℔ additional.

Antimony—
Cookson.....₩ ℔, 11¢
Hallett's.....₩ ℔, 10½¢

Brass—
Planished.....net
Roll and Sheet.....35@40%

Brass and Copper Tubes
Brazed Brass Tubing—
List May 20, 1889.

	Per ℔.
Plain, to No. 20 inclusive, above 5-16 inch to 3 inch inclusive	$0.35
Plain, to No. 20, above 3 inch	45
Plain, 5-16 inch to No. 20	45
Plain, ¼ inch	60
Plain, 3-16 inch	1.00
Plain, ⅛ inch	1.50
Fancy Tubing to No. 20, inclu	43

35@40%

Copper and Bronze Tubing—
3¢ ₩ ℔ more than brass.

Bronze, Tobin—
Drawn Rods for Bolts, Forgings, &c

Over ¼ to 3½ inches inclusive....17¢ ₩ ℔
Over 3½ to 5 inches inclusive.....18¢ ₩ ℔

Piston Rods, Finished True, Smooth and Straight.

Over ¼ to 3½ inches inclusive....18¢ ₩ ℔
Over 3½ to 5 inches inclusive.....19¢ ₩ ℔

Clips—
Buffalo Damper: Nos. 1, $1.25; 2, $2.50 per doz.....40&10%

Conductors—
Corrugated. *Round or Square—*

Galvanized.....60%
Galvanized, Locked Joints.....60%
Tin.....60%

Spiral Riveted—
Galvanized.....50%

See also *Elbows and Shoes; Eave-Trough Miters; Strainers, Conductor.*

Conductor Strainers—See *Strainers, Conductor.*

Copper—
Bottoms, Pits and Flats....25@25&5%

Ingot.

Lake.....11¢
Ansonia Grade Arizona.....10½¢
Ansonia Grade Casting.....10¢
Planished.....net
Sheet and Bolt.....25&25&5%

Tubes—See *Seamless Brass Tubes.*

Coppers, Soldering—
See *Irons, Soldering*, in Current Hardware Prices.

Damper Clips Buffalo—
See Clips, Buffalo Damper.

Eave Troughs—
Lap or Slip Joint, Galvanized.....60&10%
Lap or Slip Joint, Terne.....60%

Eave-Trough Mitres—
Lap or Slip Joint.....list, net

Elbows—
Plain Adjustable—

Tin.....70%
Galvanized.....70%

Crimped Tubing—

Re-Tinned or Galvanized.....35%

Stove-Pipe—

Buffalo Four-Piece.

4½	5	5½	6	7 inch,
$0.78	.87	.90	.99	1.20 per doz.

..20 %

Elbows and Shoes—
Flat Crimp.

Tin.....35%
Galvanized.....35%

Corrugated.
Flat Crimp.

Galvanized.....60%

Round or Square.

Tin.....60%
Galvanized.....60%

Iron, Sheet—
Black.

	Common American.	R. G. Cleaned American.
Nos. 10 to 16	₩ ℔, 2¾	3 10¢
Nos. 17 to 20	₩ ℔, 2.85	3.10¢
Nos. 21 to 24	₩ ℔, 2.90	3.20¢
Nos. 25 and 26	₩ ℔, 3.05	3.30¢
No. 27	₩ ℔, 3.15	3.40¢
No. 28	₩ ℔, 3¼	3½¢
American B. B.	₩ ℔, 4¢@4½¢	

Russia, Planished, &c.

Genuine Russia, according to assortment.....₩ ℔, 11¾@12½¢
Patent Planished....₩ ℔, A, 10¢; B, 9¢, 5%
Craig Polished Sheet.....₩ ℔, 8½¢

Galvanized.

	B. B.
Nos. 10 to 16	70&2½% @ 70&5%
Nos. 17 to 22	
Nos. 23 to 24	
Nos. 25 to 26	
No. 27	
No. 28	
Nos. 29 and 30	

Filter Joints—
Lee's.....33⅓

Lead—
American Pig.....4¼¢@4¾¢
Bar.....4¾¢
Pipe.....6¼¢, 20%
Tin Lined Pipe.....15¢, 20%
Block Tin Pipe.....37½¢, 20%
Sheet.....7¢, 20%
Old Lead in exchange, 3¼¢ ₩ ℔.

Metal, Expanded—
Manufacturers' list No. 5.

Lathing.....10%
Fencing, Painted Sheets.....20%
Netting, Painted Sheets.....20%
Door Mats, Galvanized.....25%
Window Guards, Paneled.....15%
Tree Guards, Paneled.....15%

Mitres Eave-Trough—See *Eave-Trough Mitres.*

Paints Oils &c.—

Lead, Amn. White, in oil	6¾ @ 7¼
Lead, Red, bbls. and ½ bbls	6½ @ 7
Lead, Red, kegs	6½ @ 7
Ocher, American	1 @ 1½
Red, Venetian, American	1½ @ 2½

Linseed Oil:
Raw, ₩ gal..... @ .40
Boiled..... @ .43

Spirits Turpentine:
In bbls..... @ .32

Putty:
In barrels and ½ bbls..... .01¾ @ .01¾
In tubs..... .01¾ @ .01¾
In tin cans..... .01½ @ .02¼
In bladders..... .01¾ @ .02¼

Roofing Material, &c.:
Asphaltum, Trinidad Refined, ₩ ton..... $30.00@$35.00
Asphaltum, Rock, ₩ ton..... $14.00
Coal Tar Felt, 1 Ply, ₩ ℔..... 2¢
Coal Tar Felt, 2 Ply, ₩ roll 108 sq. ft..... $1 42½
Coal Tar Felt, 3 Ply, ₩ roll 108 sq. ft..... $1.85
Roofing Pitch, ₩ bbl..... $2.25

Pipe, Drain 50%

Pipe and Fittings, Cast Iron Soil—

Cast-Iron Soil Pipe, Tarred, sizes 2 to 6 Inches, inclusive..... 60@60&10%
Other sizes..... 55@55&10%
Cast-Iron Fittings, Tarred, sizes 2 to 6 inches..... 60@60&10%
Other sizes..... 55@55&10%

Pipe, Spiral—

Galvanized..... 60%
Tin..... 60%

Rock and Slag Wool—

	₩ ℔	₩ cub. foot.
Slag Wool, ordinary	1¼	15¢
Slag Wool, extra	4½	38½¢
Rock Wool, ordinary	2½	27¢
Rock Wool, extra	7¼	43½¢

Rosin—

Common and Good—Strained,
Rosin, C. & D..... ₩ bbl. $1.02@$1.05
Rosin, E. & F..... ₩ bbl. $1.15@$1.30
Rosin, G. & H..... ₩ bbl. $1.45@$1.70
Rosin, I. & K..... ₩ bbl. $1.90@$2.35
Rosin, M. & N..... ₩ bbl $2.50@$3.50

Seamless Brass Tubes..net

Shoes and Elbows—See *Elbows and Shoes.*

Slate Roofing—

According to size, f.o.b. cars, Quarry Station.

Pennsylvania:
Best Bangor, ₩ sqr..... $3.25@$4.50
Pen Argyle, ₩ sqr..... 3.50@ 4.25
Peach Bottom, ₩ sqr..... 5.00@ 6.25
No. 1 Chapman, ₩ sqr..... 4.00@ 4.65
Lehigh Slates, ₩ sqr..... 3.00@ 4.50
Vermont:
Sea Green, ₩ sqr..... 2.70@ 3.20
Purple, ₩ sqr..... 3.50@ 4.50
Unfading Green, ₩ sqr..... 3.50@ 4.00
Red, ₩ sqr..... 9.75@12.00

Solder and Soldering Fluids—

Solder—

½ & ¼ (Guaranteed)..... 13½@14½¢
No. 1..... 11¾@12 ¢
Prices of Solder indicated by private brands vary according to composition.

Soldering Fluids—

Concentrated Soldering Flux.
f.o b. New York.
In barrels, ₩ ℔..... 4¢
Smaller quantities, ₩ ℔..... 5¢

Gedney's Soldering Fluid.
In carboys or barrels, ₩ ℔..... 2¢
$1.50 for carboy or barrel; money refunded when returned.

Perfection Soldering Flux.
No charge for package.
8bls., about 500 ℔, ₩ ℔..... 3½¢
½ bbls., about 300 ℔, ₩ ℔..... 4¢
Kegs, about 110 ℔, ₩ ℔..... 4¢
75¢ extra for keg. } 5% dis.
Kegs, about 55 ℔, ₩ ℔..... 4¢

Yager's Soldering Salts.
½-℔ bottles, each..... 30¢
Large quantities, per ℔..... 40¢

Spelter—

Western Spelter..... 4¼ ¢@4½¢
Bertha..... 8¼@8.9¢

Spiral Pipe—See *Pipe, Spiral.*

Stove-Pipe Elbows—*See Elbows, Stove Pipe.*

Stove Polish—See *Polish, Stove.*

Stove Trucks—See *Trucks, Stove.*

Strainers Conductor—

Galvanized..... 60%

Tin, Pigs and Bars—

Banca, pigs, ₩ ℔..... 22¢
Straits, pigs, ₩ ℔..... 21½¢
Straits in bars, ₩ ℔..... 23¢

Tin Plates—

American Terne Plates—

Apollo Roofing.

IC, 14 x 20..... $6.25
IC, 20 x 28..... 12.50
IX, 14 x 20..... 7.25
IX, 20 x 28..... 14.50

Buckeye.

IC, 14 x 20..... $7.00
IC, 20 x 28..... 14.00
IX, 14 x 20..... 8.25
IX, 20 x 28..... 16.50
IXX, 14 x 20..... 9.50
IXX, 20 x 28..... 19.00

De Mill's.

First New York, IC, 14 x 20..... $5.75
" " " IC, 20 x 28..... 11.50
First New Jersey, IC, 14 x 20..... 5.75
" " " IC, 20 x 28..... 11.50
Manhattan, IC, 14 x 20..... 7.00
" IC, 20 x 28..... 14.50

Dunlap's.

Double Dipped, IC, 14 x 20..... $8.25
" " IC, 20 x 28..... 16.50
" " IX, 14 x 20..... 9.50
" " IX, 20 x 28..... 19.00
Domestic, IC, 20 x 28..... 12.00
" IX, 20 x 28..... 15.00

Glendale Tin Plate Co.

Optimus, Best Redipped, IC, 14 x 20..$8.25
" " " IC, 20 x 28.16.50
" " " IX, 14 x 20. 9.75
" " " IX, 20 x 28.19.50
N. F., Old Style, IC, 14 x 20..... 7.50
" " " IC, 20 x 28..... 15.00
" " " IX, 14 x 20..... 9.00
" " " IX, 20 x 28..... 18.00
Bonus, Extra Coated, IC, 14 x 20... 6.75
" " " IX, 14 x 20... 8.25
" " " IC, 20 x 28...13.50
" " " IX, 20 x 28...16.50

Gummey, Spering & Co.

	14 x 20	20 x 28
IC Terne, Pennsyl Old Method, Treble Coated	$8.50	$16.75
IC Terne, Leominster, Extra coated	7.75	15.00
IC Terne, Waldo, Redipped	7.25	14.00
IC Terne, Alderly, Extra quality	6.37½	12.50
IC Terne, Phoenix	5.80	11.50
IC " Climax	5.70	11.25
IC " Venux	5.60	11.00
IC " Flag	5.50	10.50

Hamilton's.

Hamilton's Best Redip'd, IC, 14x20 $9.25
" " " IC, 20x28 18.50
" " " IX, 14x20 10.75
" " " IX. 20x28 21.50
Osceola Hand Coated, IC, 14x20 8.25
" " " IC, 20x28 16.50
Osceola Hand Coated, IX, 14x20 9.75
" " " IX, 20x28 19.50
Lula Best Charcoal, IC, 20x28 12.50
" " " IX, 20x28 16.00

Laufman's.

Apollo, IC (Resquared), 14 x 20.....$8.12
Apollo, IX (Resquared), 14 x 20..... 9.37
Apollo, IC (Resquared), 20 x 28.....16.00
Apollo, IX (Resquared), 20 x 28.....18.50
Apollo, IC (Resquared), 20 x 56.....16.00
Apollo, IX (Resquared), 20 x 56.....18.50
Tip Top, IC (Resquared), 14 x 20.... 6.62
Tip Top, IX (Resquared), 14 x 20.... 7.88
Tip Top, IC (Resquared), 20 x 28....13.00
Tip Top, IX (Resquared), 20 x 28....15.50
Allegheny, IC, 14 x 20..... 6.12
Allegheny, IX, 14 x 20..... 6.38
Allegheny, IC, 20 x 28..... 12.00
Allegheny, IX, 20 x 28..... 12.50

McKinley Tin Plate Co.

McKinley:
IC, 20 x 28..... $12.00
IX, 20 x 28..... 15.00
Fort Pitt.
IC, 20 x 28..... $11.00
Chicago:
I. 20 x 28..... 11.50
Wilkinsburg Redipped:
IC, 20 x 28..... $16.00
IX, 20 x 28..... 19.00

Merchant's.—All Stamped.

Crescent, IC, 20 x 28..... $12.00
Crescent, IC, 14 x 20..... 6.00
Hickory, IC, 20 x 28 (Resquared).. 12.75
Hickory, IC, 14 x 20 (Resquared)...6.37½
Empire, IC, 20 x 28..... 12.25
Empire, IC, 14 x 20.....6.12½
Alaska, IC, 20 x 28 (Resquared).... 14.00
Alaska, IC, 14 x 20 (Resquared).... 7.00
Merchant's Roofing, IC, 20 x 28 (Resquared)..... 17.00
Merchant's Roofing, IC, 14 x 20 (Resquared)..... 8.50
Merchant's Old Method, IC, 20 x 28 Resquared..... 19.00
Merchant's Old Method, IC, 14 x 20 (Resquared)..... 9.50

Merry's.

Lion, IC, 14 x 20 (Stamped).....$6.25
IC, 20 x 28..... 12.50
Palacio, IC, 14 x 20.....$5.55
IC, 20 x 28..... 11.00

Pittsburgh Tin-Plate Works.

Kensington:
IC, 14 x 20..... $6.75
IC, 20 x 28..... 13.50
IX, 14 x 20..... 8.00
IX, 20 x 28..... 16.00
Westmoreland:
IC, 14 x 20..... $6.25
IC, 20 x 28..... 12.50
Juno:
IC, 14 x 20..... $5.75
IC, 20 x 28..... 11.50

Scott's.—All Stamped.

Scott's Extra Coated, IC, 14 x 20 (Resquared)..... $9.25
Scott's Extra Coated, IX, 14 x 20 (Resquared)..... 10.75
Scott's Extra Coated, IC, 20 x 28 (Resquared)..... 18.50
Scott's Extra Coated, IX, 20 x 28 (Resquared)..... 21.50
Neville, IC, 14 x 20..... 6.00
" IX, 14 x 20..... 7.25
" IC, 20 x 28..... 12.00
" IX, 20 x 28..... 14.00

N. & G. Taylor Co.'s.

Taylor, Old Style, IC, 14 x 20 (Stamped and Resquared)..... $9.25
Taylor Old Style, IC, 20 x 28 (Stamped and Resquared)..... 18.50
Taylor Roofing, IC, 14 x 20 (Stamped and Resquared)..... 8.00
Taylor Roofing, IC, 20 x 28 (Stamped and Resquared)..... 16.00
Columbia, IC, 14 x 20 (Stamped)... 7.00
Columbia, IC, 20 x 28 (Stamped)... 14.00
Maple, IC, 14 x 20 (Stamped)..... 6.50
Maple, IC, 20 x 28 (Stamped)..... 13.00
Willow, IC, 14 x 20..... 6.25
Willow, IC, 20 x 28..... 12.50
Knoxall, IC, 14 x 20..... 6.00
" IC, 20 x 28..... 12.00
Globe, IC, 14 x 20..... 5.75
Globe, IC, 20 x 28..... 11.50

A. A. Thompson & Co.'s.

Old Colony, IC, 14 x 20.....$8.00
" " IC, 20 x 28.....16.00
Thompson's Puritan, IC, 14 x 20.....5.75
" " IC, 20 x 28....11.50
Durham, IC, 14 x 20.....5.75
" IC, 20 x 28.....11.50
Central, IC, 14 x 20..... 5 45
" IC, 20 x 28.....10.75
" WC, 14 x 20..... 5.25
" WC, 20 x 28.....10.25
Tarn, IC, 20 x 28.....10.50

U. S. Brands.—All Stamped.

U. S. Monongahela, IC, 14 x 20.....$6.50
U. S. Redipped, IC, 14 x 20..... 9.25
20 x 28 double the price of 14 x 20

American Bright Plates—

Gummey, Spering & Co.
" Phoenix " extra. Climax
IC, 14 x 20, Bright..$6.50 $6.25
IX, " " 8.00 7.75
All sizes and thicknesses, etc.

Merchant's.

Merchant's Dipped, IC, 14x20.....$11.00
Palma Xtra, IC, 14x20.....7.25
Florence, IC, 14x20.....6.75

Merry's

Hazel, IC, 14x20.....$5.85

N. & G. Taylor Co.'s.

Brilliant, Tissue Packed, IC, 14x20..$9.00
Royal, extra, IC, 14x20.....7.00
Merion, IC, 14x20.....6.75
Linden, IC, 14x20.....6.50
Almond, IC, 14x20.....6.25
Mint, IC, 14x20.....6.00

U. S.

IC, 14x20.....$7.25
IC, 20x28.....14.50

Imported Terne Plates—

Charcoal.

Dean Grade.—IC, 14 x 20.....@$5.50
20 x 28.....@11.00
IX, 14 x 20.....@ 6.75
20 x 28.....@13.50
Abercarne Grade.—IC, 14 x 20.....@ 5.40
20 x 28.....@10.80
IX, 14 x 20...@ 6.62½
20 x 28.....@13.25

Imported Bright Plates—

Charcoal.
Duty: 2.2¢ ₩ ℔.

Melyn and Calland Grade.	IC, 10 x 14	@$6.50
" "	IC, 12 x 12	@ 6.75
" "	IC, 14 x 20	@ 6.50
" "	IC, 20 x 28	@13.00
" "	IX, 10 x 14	@ 8.50
" "	IX, 12 x 12	@ 8.75
" "	IX, 14 x 20	@ 8.50
" "	IX, 20 x 28	@17.00
" "	DC, 12½ x 17	@ 6.00
" "	DX, 12½ x 17	@ 8.00
Allaway Grade.	IC, 10 x 14	@ 6.00
" "	IC, 12 x 12	@ 6.25
" "	IC, 14 x 20	@ 6.00
" "	IC, 20 x 28	@12.00
" "	IX, 10 x 14	@ 7.50
" "	IX, 12 x 12	@ 7.75
" "	IX, 14 x 20	@ 7.50
" "	IX, 20 x 28	@15.00
" "	DC, 12½ x 17	@ 5.50
" "	DX, 12½ x 17	@ 7.00

Coke.

Steel Coke.—IC, 10x14, 14x20.$5.40@$5.50
10x20.....@ 8.50
20x28.11.50@12.00
IX, 10x14, 14x20.....@ 6.75
B. V. Grade.—IC, 10x14, 14x20.....@ 5.50

Imported Boiler Plates.—

IXX, 14x26..(112 sheets)..... @$13.35
IXX, 14x28..(112 sheets)..... @ 14.50
IXX, 14x31..(112 sheets)..... @ 16.00

Tinning—

Brass and Copper.....net

Tubing—

Tin..... 55%
Galvanized..... 55%

Brass and Copper.—

Standard List..... 35@40%

Troughs, Eave—See *Eave Troughs*

Trucks Stove—

Improved Lock Frame, per doz....$15.00
Steel Lock Frame, per doz..... 18.00
Daisy Improved Pattern, ₩ doz..... 18.00

Zinc—

600 ℔ casks..... ₩ ℔ 5¾¢@6¢
Per ℔..... 6¼¢

News and Notes.

The promising seaport of Newport News, Va., has added another to the list of its recommendations in the inauguration of the Chesapeake & Ohio Steamship Company, a new line of steamers to ply between that place and Liverpool, London, Glasgow and other European seaports. The line, which is virtually owned by the Chesapeake and Ohio Railroad Corporation, was formally opened on September 9, when a large party of Western business men and exporters were taken to Newport News as visitors of the company, in order to participate in the starting. This line opens up a direct through shipping route between St. Louis and Chicago and the Atlantic, and it is expected to largely stimulate the foreign trade of those cities, practically giving to the West an Eastern port of their own. It has been arranged to issue through bills of lading between the Western cities and the European ports, and handle the freight direct from the cars to the ship and *vice versa.*

It appears that numbers of the Columbian souvenir half dollars are drifting back into the Treasury after having been disbursed at their denominational rate. Large quantities of the coins remain undisposed of, and it is evident that the issue was too large.

One hundred and thirty plans for the new City Hall have been received by the New York Municipal Buildings Commission, from architects in all parts of the country. Three leading American architects have been named as an advisory committee to examine the plans and assist the commission in arriving at a decision. Six plans are to be selected for the final competition. The author of one of these will be awarded the order for constructing the new building. Its architect will get 5 per cent. of the first million expended, 4 per cent. of the second million, and 3 per cent. of all other sums. The architects of the remaining five best plans will get $2000 each.

Interesting statistics in regard to the petroleum industry of Pennsylvania are given in the recent report of Albert Bolles, Chief of the Department of Internal Affairs. The total capital invested in the oil industry of the State including vessels and pipe lines is given as $300 000,000. Pipe lines aggregating 25 000 miles have been laid and 59 tank steamers are now employed in conveying the oil abroad. The advance in cheapness of petroleum has been extraordinary. In 1861 a gallon of oil in bulk cost not less than 58 cents, and in 1892 the price was not more than 3½ cents. It is stated as a fact that a larger percentage of oil product is now shipped abroad than that of any other product except cotton.

A gold medal of the value of 1000 Italian lire is offered to open competition by the Royal Academy of Science of the Institute of Bologna, Italy, for the best memoir describing a new and efficacious system for preventing or extinguishing fires.

The "Lucania," the newest Cunarder, broke all maiden records on her recent trip from Queenstown to Sandy Hook. She promises to eclipse her sister ship, the "Campania," when she gets down to business, for record-breaking.

LABOR EXCHANGE.

Notices under this heading of reasonable length are inserted free of charge. Only those relating to employment are admitted. Write distinctly on one side of paper only, and do not use postal cards.

HELP WANTED.

At once, first-class MOLDER to take charge of brass foundry. P. O. Box 413, Trenton, N. J. Sept. 23

A good TINSMITH and GENERAL JOBBER, for all kinds of country work; steady job all year round. F. L. Frick, Manhasset, L. I. Sept. 23

Twenty-five CORNICE MAKERS; steady work; union wages. Bay State Metal Works, 49 Harvard street, Cambridge, Mass. Sept. 23

A good TINSMITH, one well up on furnace work and roofing. E. A. Perpall & Co., Flushing, N. Y. Sept. 23

METAL SPINNERS. John C. Jewett Mfg. Company, Buffalo, N. Y. Sept. 23

A first-class PLUMBER immediately; will agree to give a steady job to the right man. Apply with reference to Daniel F. Kelly, 76 Crown street, New Haven, Conn. Sept. 16

A man who understands CORNICE WORK and TINNING; to a competent man will give steady work the year round; state wages wanted and experience. E. H. Friedrich, Holyoke, Mass. Sept. 16

At once, a first-class TINSMITH, ROOFER and GENERAL JOBBER; one that can do plumbing and wipe a joint preferred; must be sober and steady; none but first-class man need apply; state wages and give references. P. E. Fraleigh, Red Hook, N. Y. Sept. 16

A first-class ROOFER and CORNICE MAKER; each to be competent in his own line. J. H. B. Hoffmann, 38 Green street, Albany, N. Y. Sept. 16

SITUATIONS WANTED.

As FOREMAN in an iron foundry, by a practical molder; understands the handling of men and all the duties connected with iron and foundry business; can furnish good reference. "W. T. C.," 113 Hewes street, Brooklyn, E. D., N. Y. Sept. 23

STEAM and GAS FITTER wishes employment in country; 26 years. Geo. P. Farrell, 322 West Seventeenth street, New York. Sept. 23

By a a PRACTICAL MECHANIC, CUTTER and FOREMAN; 27 years' experience at the tin, copper, sheet iron, galvanized iron, cornice and slating work; thorough draftsman; can estimate on work; speak English and German; state wages. J. Hase, St. Louis, Mo. Sept. 23

In good general hardware store as SALESMAN and BOOKKEEPER; or to exchange a fine improved 400 acre farm, lightly encumbered, for $6000 stock general hardware; farm in East Nebraska. C. W. Crum, Norfolk, Neb. Sept. 23

By a CORNICE MAKER; ten years' experience; inside or outside; can furnish first-class references as to ability and sobriety; job preferred where I can have a chance to finish learning cutting. "Chas R.," 945 North Fairfield avenue, Chicago, Ill. Sept. 23

Young man 22 years of age wants a steady job at TINNING; five years' experience; sober and industrious. Frank A. Fleck, Middletown, Dauphin County, Pa. Sept. 23

Steady position wanted by a young man with three years' experience at plumbing, to finish trade and get practical experience; can wipe a joint; furnish his own tools; graduate of New York Trade School. B. G. Descher, 242 Meeting street, Charleston, S. C. Sept. 23

An experienced PLUMBER, STEAM and HOT-WATER FITTER with some knowledge of the tinning trade; can take charge of work; can estimate on any kind of work and take charge of men, wants a situation or will take sub-contracts on steam and hot water fitting. "F. G.," York, York County, Pa. Sept. 23

By a young man 27 years of age, as TINNER; seven years' experience in tin and sheet-iron working; can furnish best of references. "Tinner," 314 Glen Rock avenue, Waukegan, Ill. Sept. 23

As SUPERINTENDENT of stove and range works; am well posted in steel range manufacture and am familiar with every department of stove foundry; best of references. "Ranges," Box 923, office of *The Metal Worker*, 96-102 Reade street, New York City. Sept. 23

As PLUMBER, by Henry Schlag, 420 East Fifty-ninth street, New York. Sept. 23

As PLUMBER, by Edmund Walsh, 304 East Fifty-ninth street, New York. Sept. 23

By a first-class MACHINIST and LATHE HAND; city or country. P. Klein, care of Roth, 228 East Second street, New York. Sept. 23

By a first-class MACHINIST and LATHE HAND, city or country. L. Fried, 341 East Houston street, New York. Sept. 23

FOUNDRY SUPERINTENDENT open for engagement after October 1; first-class manager; competent to take entire charge of any works; thorough knowledge of every branch of range, furnace, steam and hot-water business; ten years in charge of extensive works; highest references. "Superintendent," Box 923, office of *The Metal Worker*, 96-102 Reade street, New York City. Sept. 23

By a young man, 23 years of age, place in PLUMBING and TIN SHOP; four years' experience; also some knowledge of steam and gas fitting. "S. C.," Box 23, Westport, N. Y. Sept. 23

By a MACHINIST; can work at machine repairing; German. Philip Shepherd, 201 Second street, Elizabeth, N. J. Sept. 23

By a TIN and SHEET-IRON WORKER, PLUMBER and GENERAL JOBBER; can do all kinds of inside and outside work. J. Nangle, 14 Boylston place, Boston, Mass. Sept. 23

BY PLUMBER, GAS FITTER and experienced jobber. H. Vehstedt, 245 East 114th street, New York. Sept. 23

By a first-class TINSMITH, proficient in all branches of the trade; strictly sober and trustworthy. La Seur, 552 Broome street, New York City. Sept. 23

As INSPECTOR or FOREMAN of mounting shop; 20 years' experience in large stove works; first-class references. "Inspector," office of *The Metal Worker*, 96-102 Reade street, New York City. Sept. 23

As TINNER or CLERK; three years' experience; can make tinware and do roofing and spouting; best of habits and reference; good job desired; wages no object. "Jack the Tinner," Nappance, Ind. Sept. 23

TINSMITH, a good all-round hand for inside and outside work, and also jobbing in plumbing, wishes a good situation in country. Harry Rosenbloom, 78 Bayard street, New York City. Sept. 23

Young man, age 23, with good reference, worked at the tin, sheet-iron, stove and furnace business for four years, would like to get a steady job in the Eastern or Middle States; salary very reasonable to begin with if there is any chance for improvement. F. G. Shadigg, Prescott, Wis. Sept. 23

By a TINSMITH, 30 years old; 15 years' experience; good all round worker; especially on pieced tinware; state wages. "J. S." care A. Gnant, 788 Grand street, Brooklyn, N. Y. Sept. 16

By a first class PLUMBER, sober and reliable; can furnish reference. "Plumber," 916, office of *The Metal Worker*, 96-102 Reade street, New York City. Sept. 16

A first class TINNER of 18 years' experience on outside and inside work; with some knowledge of plumbing; can furnish tools and machines if needed. P. O. Box 599, Negaunee, Mich. Sept. 16

By a young man as PLUMBER; five years' experience; city or country; steady work desired. "A. M.," office of *The Metal Worker*, 96-102 Reade street, New York City. Sept. 16

As SALESMAN for tin plates and metals or stoves; ten years' experience. W. H. Culp, Box 191, Sunbury, Pa. Sept. 16

An experienced working FOREMAN in cornice and skylight shop, good draftsman and accurate cutter, desires a position where industry and ability will be practically appreciated; can work men to advantage and do all kinds of circular work by hand or machine; steady and temperate. "Reliable," 916, office of *The Metal Worker*, 96-102 Reade street, New York City. Sept. 16

By a practical MOLDER and FOUNDRYMAN, as SUPERINTENDENT or FOREMAN in an iron foundry doing a general line of work; 43 years of age; 30 years in the foundry, and for the past 5 or 6 years have had charge in that capacity; is thoroughly acquainted with all the details of foundry work and can handle men to advantage, also the management of cupola and mixing of irons; energetic, sober and industrious; speaks both English and German. "X. X.," office of *The Metal Worker*, 96-102 Reade street, New York City. Sept. 16

PLUMBER—A first-class steady man would like a position outside of New York City; will furnish best of reference. Alex. Gillespie, 2177 Eighth avenue, New York City. Sept. 16

As a TIN or SHEET-IRON WORKER; furnaces, heaters and ranges set and iron work of every description. S. Teichman, 228 Stanton street, New York City. Sept. 16

As a TIN and SHEET-IRON WORKER; furnaces, heaters and ranges set; iron work of every description; job work a specialty. M. Rossen, 103 Broome street, New York City. Sept. 16

By a practical TINSMITH of 18 years' experience; can do furnace work, gas fitting, pump work and a good knowledge of plumbing. William F. Payne, Far Rockaway, Long Island. Sept. 16

By an experienced PLATER who understands silver, nickel brass and copper plating and oxidizing; 26 years' experience. J. Wilson Smith, 79 Crown street, Meriden, Conn. Sept. 16

At PLUMBING and HOT-WATER HEATING, city or country; 18 years' experience; competent on small or large jobs; A1 references. "Sanitary," office of *The Metal Worker*, 96-102 Reade street, New York City. Sept. 16

By a competent FOREMAN on cornices and skylights. "F. R.," office of *The Metal Worker*, 96-102 Reade street, New York. Sept. 16

By a practical TINSMITH, for inside or outside work; also furnace and pump work and gas fitting; fair knowledge of plumbing; 18 years' experience; steady job desired. Wm. F. Payne, Far Rockaway, L. I. Sept. 16

By an experienced FOUNDRMAN, ten years at stove plate and one year at brass molding and eight years in the iron pattern shop, wishes a steady job; location no object; last situation eight years. "N. M.," 619 Concord avenue, Detroit, Mich. Sept. 16

A young man would like work at WOOD PATTERN-MAKING; has had three years' experience; can give good recommendation, and understands flask making and follow boarding; would like work at either; state wages. Edgar F. Kenny, 22 Chestnut street, Norwalk, Conn. Sept. 16

By January 1, 1894, as MANAGER, CLERK, CASHIER, BOOKKEEPER or BUYER, by a young man, 29 years old; 12 years' experience in hardware business; only a position with first-class firm considered. "H. F. J.," office of *The Metal Worker*, 96-102 Reade street, New York City. Sept. 16

By an experienced SALESMAN of hot-water and low-pressure steam heating boilers, thoroughly posted heating engineer; make estimates; lay out work; make plans; superintend construction, &c.; 12 years' experience; acquainted with Ohio, Northern New York and Pennsylvania trade; have large number of successful jobs in operation; no failures. "H.," office of *The Metal Worker*, 312 Cuyahoga, Cleveland, Ohio. Sept. 16

By a first-class TINSMITH, a steady position in country shop; has had eight years' experience inside and outside furnace work; all kinds of work done in a first class shop. W. E. Benninger, 59 Park street, Glens Falls, N. Y. Sept. 9

By a TINSMITH, an A1 mechanic; sober steady and trustworthy. "Tinsmith," 552 Broome street, New York City. Sept. 9

A NICKEL PLATER, 12 years with Fuller & Warren Company of Troy, N. Y., desires a situation with some responsible stove firm. George Wright, 83 Watson street, Bath on the Hudson, Rensselaer County, N. Y. Sept. 9

Good TINNER wants job where he will get good pay for what he can do; in and outside jobber and roofer; can put up and repair heaters, ranges and furnaces; also a good handy man on cornice work; state wages. Wm. Carrico, 1035 Milwaukee avenue, Chicago. Sept. 9

By ASSISTING CUTTER, able to do all kinds of hammer work from drawing; well posted in clay modeling and stamping sheet-metal ornaments; can furnish good references. "H. A. C.," office of *The Metal Worker*, 96-102 Reade street, New York City. Sept. 9

By a TINSMITH, good at inside and outside work, 26 years of age, ten years' experience; can also do furnace work. Frank J. Bach, 1013 McLean street, St. Paul, Minn. Sept. 9

As SHIPPING CLERK, by a young man 25 years of age; is well posted, and would be willing to make himself generally useful; can adapt himself to any line; good references can be given. E. Laurence, care Keller & Beebe, 129 Beekman street, New York City. Sept. 9

By September 15, by a man having a thorough knowledge of the manufacture of gas cooking and heating appliances, also competent in wood and metal pattern work; can give best of references. "A. W. R.," 183 Niagara street, Buffalo, N. Y. Sept. 9

By a practical ELECTRO-PLATER; good reference; any line; ten years' experience. "F. J. L.," 28 Seymore avenue, Cleveland, Ohio. Sept. 9

A TINNER and PLUMBER of 11 years' experience would like to connect himself with some good reliable hardware firm in a farming country; am 26 years of age, have a full set of tools, strictly sober and can furnish the best of references; for further particulars address "C. F. F.," 143 West Gogebic street, Ironwood, Mich. Sept. 9

Special Notices.

PLUMBING BUSINESS.

Wanted to purchase, an established Plumbing and Heating business in a city of not less than 30,000, or will buy interest in profitably established business. Address, with full particulars,
"BUYER,"
office of *The Metal Worker*, 59 Dearborn street, Chicago.

BY EXPERIENCED MAN,

well established Hardware, Stove and Plumbing business in good locality, or would enter partnership with right party. Address
L. M. BARNES, Collinsville, Conn.

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For Sale cheap. For any information write or inquire of C. H. ANDREWS,
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All or part interest in a specialty business established ten years in Philadelphia; centrally located, doing a good trade, with good profits. Any person with a knowledge of the tin and sheet-metal trade would be adapted for the business. Reason for selling, other interests require present owner's attention. Address
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office of *The Metal Worker*, 220 South 4th street, Philadelphia.

Partner Wanted.

A member of a large wholesale house with superior connections and well-established trade among stove dealers and kindred branches desires a partner, silent or active. Particulars furnished to parties who send full name and address. Apply
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WANTED.

A thorough practical man in Furnaces, Plumbing or Steam Fittings, to buy the interest of an inexperienced partner in a business established five years. Give reference. Address
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FOR SALE.

To Close an Estate.

An old (11 years) established plumbing business, with stock and tools, in a live Western City having water, sewer and gas systems. A rare chance for a practical man. Address
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WANTED

To buy cold rolled scrap steel, 4 ft. long, 3 to 5 inches wide, No. 16 or 18 gauge, or oblong pieces 12 x 16.
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FOR SALE.—Furnace has an established and splendid reputation and is covered by patents of exceptional value. No investment in plant necessary if purchaser sees fit to continue present arrangement and have goods made on a favorable contract. No old stock, bad debts or embarrassing circumstances; a good and clean deal at a bargain; a fine opportunity for a man or men who like the business and have moderate capital: the present manager doesn't like it; was 13 years in an entirely different line; has been five years in this; wants to get back where he belongs—doesn't want to sell because of "poor health," "a desire to retire" or other reason of a fakish character. Send for particulars and catalogue. Address
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An old established Stove and Tin business, with stock and tools, at Thomaston, Conn. Only small capital necessary. A rare chance for a practical man. Good reason for selling. Address E. A. BRADLEY, Waterbury, Conn.

FOR SALE.

A well established Plumbing business; can give good reason for wanting to sell. Address
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At satisfactory price and terms I would buy the manufacturing rights and patterns of a good furnace. Address
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THE METAL WORKER.

NEW YORK AND CHICAGO.

Saturday, September 30, 1893.

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Preparing for Cold Weather.

An announcement in the reports of the United States Weather Bureau on September 26 that the thermometer stood at 10° F. in Minnesota on the night of the 25th, that ice had formed there to the thickness of ¾ inch, that a cold wave was approaching the Atlantic Coast, and that the frost line was rapidly nearing New York City, together with a remarkable fall in temperature immediately following the prediction, on the 26th, had the effect to direct public attention to yet uncompleted preparations for meeting the fast-approaching cold of winter. Usually, in the stove and heating trade, the first cold snap has the effect to stimulate the always large dilatory class and to boom trade. This year the prevailing financial depression will have an opposite effect, to some extent; but from this time on to the advent of genuine winter weather the trade will feel an added impulse. It should be remembered that timeliness is often an element of economy, and that it is generally cheaper to adopt measures of prevention than to supply cures for evils due to negligence. Undoubtedly some who have thought they could get through the winter without incurring the expense of needed attention to heating apparatus will this year have to sit in the cold while repairs that should have been made before cold weather are completed.

San Francisco Midwinter Fair.

Preparations are going on apace for the great Midwinter Fair to be held in San Francisco next winter. Five buildings are being erected in Golden Gate Park for the accommodation of the exhibits. That of the Manufactures and Liberal Arts will be a handsome structure of Moorish design, 450 feet long and 250 feet wide, with a hight of 55 feet. It is reported that intending exhibitors have applied for space in such large numbers that the management is already confronted with a serious difficulty in the provision of sufficient accommodation to satisfy all the applicants. That the fair will be a success is taken for granted, and it seems that the city of San Francisco is determined to make every effort to that end. The arrangements of the management are being made on an elaborate scale, and enough money has been subscribed to guarantee their being carried out. Doubtless such an exhibition will be an inducement to many travelers from the East to turn their steps toward the Pacific Coast this winter.

Trade Schools in America.

Professor Ripper, principal of the Sheffield Technical School, England, has lately returned home from Chicago, where he has visited the World's Fair. While in the United States Professor Ripper paid special attention to the condition of trade education in this country, and he is reported as having accumulated a large amount of information in connection with this subject, which he intends turning to account in the improvement of similar work in England. As Professor Ripper is one of the leading authorities on manual education in England, it is gratifying to find that he expressed himself on his return home as having been much impressed with the methods and appliances in use in the manual training schools of this country and with the enthusiasm for technical education which he found to exist here. The schools, he says, were generally well equipped and under the charge of men of considerable ability. Among the most notable institutions of this class which he visited was the New York Trade School, which appears to have impressed him very favorably.

The Antwerp Exhibition.

Of the making of exhibitions, as of books, there seems to be no end in these days. Extensive preparations are now being made for the great International Exposition to be held in Antwerp next year. It will cover an area of about 200 acres in the new quarter of the city, near the River Scheldt and the new docks. The main buildings are to occupy 120,000 square yards, and will have sections devoted to industrial and commercial exhibits, including machinery and electrical appliances. A concert hall to be constructed will cover 6000 square yards. The principal idea in the exhibition is to afford Europeans an opportunity of inspecting some of the exhibits which have already been displayed at the Chicago World's Fair, and numbers of exhibitors in that enterprise have consented to transfer their products to Antwerp for the purpose at the close of the Columbian Fair. Foreign governments have been officially advised of the project by Belgium, and have been invited to appoint commissioners to represent them. All inventions, patents, drawings, models and trademarks exhibited will be placed under the immediate protection of the Belgian Government, and all rights in respect of them will be secured. Goods arriving from foreign countries by the Belgian State railways will be returned carriage free over the same lines, and most of the regular lines of steamers will take exhibits at reduced rates of freight. The exhibition will be opened on May 5, 1894, and promises to be as great a success as the one held before in Antwerp. Many of the features of the Chicago Fair are to be reproduced, including a "Midway Plaisance," but the Ferris Wheel will be conspicuous by its absence.

Railroad Accidents.

An epidemic of frightful railroad disasters seems to have broken out. In the month of September thus far there have been no less than four terrible accidents, as follows: On the Boston & Albany, at Chester, Mass., in which 17 were killed and 28 injured: on the Pennsylvania, at Colehour, Ill., in which 13 were killed and 17 injured; on the Illinois Central, at Manteno, Ill., in which 8 were killed and 18 injured, and on the Wabash, at Kingsbury, Ind , in which 11 were killed and 15 injured. These accidents have occurred on some of the best railroads in the country, having the highest reputation for careful management. In nearly every case, however, the cause can be traced to some one person who either forgot something he should have done or else perpetrated a fearful blunder through sheer carelessness. Wholesale denunciation of railroad managers is quite popular now, under such circumstances, but the real culprit is the forgetful operator or the careless trainman. The best system in the world can be nullified by the man whose duty it is to carry out some petty detail.

According to a European exchange, Castelin & Camion, Mezieres, France, have constructed an aluminum launch for the French expedition to Central Africa. It is composed of 30 pieces; it is made of plates 8 to 10 inches thick, is 33 feet long and 8 feet beam, and weighs complete with wooden fittings only 1780 pounds. The same firm are constructing a number of aluminum vehicles for use in Africa, and they propose to introduce them also into the French possessions in Asia.

Modern Improvements.

BY L. M. W.

Father had always heated the old homestead with stoves, but as it was large and several rooms had to be warmed this made considerable labor and some dirt. Mother was getting along in years, we were growing up and the old house was just a little dilapidated compared with some of its more modern neighbors. Susie's beau was an architect, and had said that a beautiful old colonial residence could be made of it on a reasonable expenditure, and all of its highly prized antiquity preserved, with all of the necessary elegance added and the modern conveniences provided. Well, the carpenters and painters certainly made the old house look grand, and our John said the new bathroom beat taking a scrub in a washtub in the kitchen after all the folks had gone to bed by as much as two pair all of one kind beat a full house, whatever that meant. All of the down-stairs rooms had new ceilings that were white as snow, and with filigree and fluting around the edges they looked as inviting as a company pie.

To save all that coal and ash carrying, and ash poking and dirt, a brand-new sanitary hygiene warm air apparatus was either "instituted," or "instilled," or "installed," I don't know which, in the cellar. Anyhow, it was "sot thar," as Ezekiel said, to heat the whole house, and the "heating engineer"—I think that is what the offshoot from a stove jobber called himself—said it would furnish all through the house a balmy summer atmosphere when the weather was cold enough to freeze a fire if you forgot and left it out all night. Nickel plated registers in the floor downstairs and white and black enameled and bronzed registers were in what the girls called the pink room, the blue chamber, the guest chamber and other rooms upstairs. Pipes led from the transposer, which transformed a rip-snorting norther into a soft summer zephyr, to all the flues and registers. The "duct"—I've been ducked, but it was always in water—that brought in the raw air to be served warm as atmosphere, was nothing but a big wooden box that Jason Woodcraft made. One end took in the whole of a window, and was big enough for a man to crawl through. Well, that air duct nearly wrecked the "institution" that was "installed," so far as the family's favor was concerned.

There were some open fire places where wood was burned and the furnace that had been "instilled" was not started until winter jumped down on us one day with both feet and about 3 inches of snow. We lived near two railroads and not far from four manufactories, and as everybody had to fire up according to the weather the soft coal smut that was made was a caution. Why, before noon that snow looked like the mashed potatoes at a country dinner, it was peppered so profusely. Manufacturing had increased that summer and the air was full of soot.

Well, this same wind was awhistling through our new apparatus and out of them registers, but the house was comfortable, that is sure. One day I got notice if I couldn't brush my clothes and keep clean I had got to keep out of the guest chamber and a boy had no business to sit on a bed with a white coverlet on it, anyhow. Now, I hadn't been in that room or hadn't sat on that bed, but I had to keep still. I concluded to investigate, and watching my chance I slipped into that room, and sure enough right opposite the register was as fine a smudge on that bed as if a chimney sweep had sat in it.

The next time I was hauled up it was for throwing my cap against the ceiling in the sitting room, and though I protested I hadn't done it they showed me the spot on the ceiling as conclusive evidence of my guilt. Things were getting pretty black for the house, and correspondingly blue for me, when one day a white muslin dress that had been all done up for a party was hung on a chair in front of a register in an upstairs room. That day the wind was blowing right from both railroads where they were drilling a lot of cars and all of the factories were running at full pressure. When they took that frock off of the chair they smoothed it down with their hands and left some very plain evidences of soot.

This let the cat out of the bag and me out of disgrace and a tour of inspection followed, which found the ceilings in a terrible condition; some pictures had to be cleaned and explanation was found for a lot of dirt that had been a mystery and the cause of a lot of extra work in cleaning. Well, there was another kind of an atmosphere and the heating engineer was in it and he didn't enjoy it, for he found it pretty hot.

He suggested closing the cold-air window and connecting the box with a big register in the hall, but mother wouldn't have a hole cut in her carpet 2 feet by 3, and father remembered all he had said about "sanitene and hygiary," so he was all at sea.

The upshot of the matter was a dicker for a new steam heating apparatus, and it would have gone in if they hadn't wanted to run pipes right through the rooms, parlor and all, and to put great big iron radiators right in front of the windows where the girls want to sit. The row this kicked up caused delay, and a fellow came along about this time selling a patent wind sifter that he said would purify, rarify and indemnify the air that passed through it against "mycrobees batchalies or other imported matter." We had to have a big one, and ours is about the size of a big chicken coop and is filled with cheap dry goods, but it does the business.

Molder and Judge.

The story of the life of Isaac C. Gordon of Pennsylvania, ex-Chief Justice of the Supreme Court of the State, who died lately, is one which shows the wonderful possibilities which lie before young men in this country. Beginning life with absolutely no extraneous advantages, he began to support his family at the age of 16 by working as a laborer in an iron mill. Here he learned the trade of a molder, but being crippled by an accident and confined for months, he developed a taste for that study to which he had never before been able to devote any time. This gave him aspirations beyond his then environments, and on restoration to health he managed, while still working at his trade, to obtain a school education. Later he studied law and was admitted to the bar, entirely through his own unaided exertions. His subsequent career in his chosen profession was one of unbroken success, and was crowned by his appointment to the highest judicial office his native State could bestow.

OBITUARY.

ALEXANDER K. RIDER.

Alexander K. Rider, widely known to engineers through his invention of a variable cut off for steam engines, and also through his invention of the Rider hot-air pumping engine, which has been very extensively used for raising water in tall buildings in American cities, died at his home in Walden, N. Y., September 13, 1893. Besides being an engineer of note Mr. Rider was an accomplished foundryman. He was born January 18, 1821, came to America from England, a boy without capital, and began his career as core boy in the Phœnix Foundry in New York City. Rapidly rising to the position of foreman and thereafter to superintendent of these works, he left them to become the first superintendent of the foundry and machine shop of Hogg & Delamater, subsequently established at the foot of Thirteenth street, North River, New York, which afterward became the celebrated Delamater Iron Works. In 1854 he started in business for himself at the foot of Fifty-ninth street, New York, in a foundry and machine shop. But having received a severe injury which nearly cost him his life, and from which he never fully recovered, he abandoned this enterprise. He subsequently became the successful manager of a slate quarry in Vermont, and afterward retired from active business to a residence in Walden, where he spent the remainder of his life. During his connection with the works of Hogg & Delamater he perfected the processes of sweeping propeller molds in loam, and also of molding small propellers in green sand. He also invented the cut-off valve gear and hot air engine above named during this period. He was an exceedingly able mechanic, both with hand and head, an extensive reader, a close thinker and a man of honor and integrity in all his dealings.

OWEN MURPHY.

Owen Murphy, who recently died at his home at 631 East 136th street, New York, was born in Ireland 65 years ago and came to this country when a child. For 17 years he was in the tin and coppersmithing and plumbing business in Houston street. He rendered excellent service during the draft riots in controlling the mob and saving property. He was elected twice to the Legislature, and was a member of the School Board and Superintendent of Wharves and Piers. In 1871 he was a member of the Excise Board and its treasurer. His entire fortune of $250,000 and much trust money in his hands was swallowed up in the panic of 1872–73, after which he left the country returning in a few years to New York where he spent the remainder of his life. He is survived by his widow and six children.

The costliest mile of railroad, says an exchange, is a mile measured on the steel portion of the Forth Bridge. The length of this portion is a mile and 20 yards, and the cost of it was considerably over $10,000,000. The most expensive railway system in the world is the "Inner Circle" line of London, which cost, including the purchase of land, from $3,000,000 to $5,000,000 per mile. The last constructed mile, between the Mansion House and Aldgate, cost altogether, including "compensations," nearly $10,000,000.

WORLD'S FAIR NOTES.

The New York Belting & Packing Company

of New York, whose branch offices are located in all the leading cities of the country and have even been established abroad, have a magnificent exhibit of their specialties at Column J 27, Machinery Hall. A characteristic pavilion has been erected for the purpose. The posts of this structure are pieces of large rubber hose, with metal bands round them to which the supports of the roof and the railings are attached. The railings are a combination of rubber work, such as hose and bicycle pedals, the latter being arranged to form lattice work. Entrances are archways of rubber hose. Festoons of rubber hose are hung under the muslin canopy forming the roof. Inside the pavilion are placed in orderly groups an immense number of specimens of the varied products turned out by this company. There are columns made of belts of different widths, from 60 inches down. Other columns are composed of emery wheels. Rubber hose of many sizes is shown, including mammoth hose for high pressures. Rubber mats and pressed goods are displayed in great variety. Prominent in the display are bicycle goods, much attention being given to pneumatic tires. Samples are shown of such tires with which famous bicycle races were won. Included among the exhibits are specimens of pure rubber, shown just as they are received from the rubber-producing districts of South America.

The Ferris Wheel Profitable.

The great Ferris wheel has justified the faith of its designer and those who backed him with their means. It has paid the cost of its construction and will now yield dividends to its owners. When the concession for the wheel was granted the Ferris Wheel Company were permitted to take in $300,000 before they began paying any percentage to the Exposition Company. This mark was passed September 8, with $3000 to spare. Hereafter 50 per cent. of the receipts will be turned over to the Exposition Company. The daily average business for the wheel has increased gradually until the receipts on the 8th were $8000.

The Capitol Mfg. Co.

of Chicago make a fine exhibit of bolt-cutting and nut-tapping machines at column L 41, Machinery Hall. These consist of a Cook automatic nut-tapping machine, two double-head and three single head bolt cutters, and a machine for threading and cutting off small pipe. The nut tapper is exhibited at work on ¼-inch nuts, needing no attention from the operator except to fill its hopper with blanks, and turning out completed work with marvelous celerity. The bolt cutters shown cover a range of work from $\frac{3}{16}$ to $3\frac{1}{2}$ inches, all making the thread with a single cut. The pipe threader is new. It will cut and thread pipe up to $2\frac{1}{2}$ inches. The pipe dies are inserted in an Adams head of the kind used on the bolt cutters. Another head has a two-jaw universal chuck. Between these heads is a movable carriage having jaws to hold the pipe, which can be passed entirely through the machine, as the spindles of both heads are hollow. The spindles are operated by independent clutches.

Northampton Emery Wheel Company

of Leeds, Mass., make an excellent exhibit of grinding machinery at D 53, Machinery Hall. They show a great variety of machines for edge and surface grinding, shaping, interior and exterior work, single wheels, double wheels, &c. With the exception of a very few these machines are shown belted up and ready for operation. Their Chicago office is at 20 South Canal street.

The Springfield Emery Wheel Company

of Bridgeport, Conn., occupy space at Column E 52, Machinery Hall. They make all kinds of Emery Wheels for all purposes, and their exhibit includes several pyramids of such wheels to indicate the character of their product. The feature of the display, however, is grinding machinery. They are builders of the heaviest grinding machinery in the world, and consequently make some notable exhibits in this line. An automatic knife-grinder for planing mills, grinds knives up to 144 inches in length. Water is used on the wheel to prevent the drawing of the temper from the knives. It requires no attendant after the knife is set and the machine set in motion. Another automatic knife-grinder has the base and bed in one casting, which makes it very rigid and free from vibration. There are two water tanks in the base of this machine. A centrifugal pump takes water from the lower tank and sends it through pipe connections directly on the knife where it is being ground. The water then runs down into the upper tank where the sediment settles, and the clear water overflows to the lower tank. A large tool grinder is shown which also has a base and bed cast in one piece, with tanks located inside the base. A No. 3 surface grinder exhibited resembles in appearance a metal planer, the Emery Wheel being attached to the crosshead, which is raised and lowered by a belt from the countershaft. It is designed for grinding boiler fronts, but is adapted to grind any wide articles. The platen is propelled by a worm and worm gear connected to a large screw running through the center of the bed and connected to the platen by a long clamp nut, which gives a steady movement to the carriage, preventing vibrations that would impart a wavy look to the work. Two of these machines and two tool grinders were sold in the spring to the Chicago, Burlington & Quincy Railroad. A small floor grinder is shown, carrying two wheels up to 10 inches in diameter; another, somewhat larger, carries two wheels up to 20 inches or four thin wheels. A 60-inch automatic knife grinder is a heavy tool designed for grinding shear blades, veneer knives, planing-mill knives, &c. Three different styles of emery wheels are used on these machines to suit the different classes of work to be done by them. A special field of usefulness for these grinders is opening up in plate rolling mills. When plates are cut to size or in special shapes the edges are squared or trued on these grinders, accurate and speedy work being done with a minimum of time and labor. Lack of space prevented a car-wheel grinder from being shown. This is a tool for grinding partly worn wheels into shape for continued use. It grinds wheels on or off the journal at the rate of ten pairs per day. The company have a Western agency at 125 South Clinton street, Chicago.

The Compress Wheel Company

of 149 and 151 Huron street, Chicago, make a good exhibit at A 53, Machinery Hall, of their special style of wheels for polishing and buffing. They are shown with faces made of a variety of materials. A high column is erected, comprised of 32 wheels mounted on spindles, attached at right angles to a central support consisting of a stout wrought pipe. These wheels are shown in a variety of sizes.

C. E. Le Massena & Co.

of 776 Broad street, Newark, N. J., exhibit a showcase at B 50, Machinery Hall, containing many specimens of their solid leather polishing wheels, cones, paper wheels, &c. The leather wheels are made of disks of new oak tanned leather put together with elastic waterproof cement under heavy hydraulic pressure. They are turned to any shaped face, beveled, concave or convex. The material used resembles the finest walrus or sea-horse leather, but is much more economical. These wheels are in use for stove work, cutlery, plows, edge tools, saddlery hardware, nickel goods, jewelry, &c., and are made hard, medium or soft and medium, according to the service to which they are to be put. The paper wheels have emery or corundum applied to the face, are designed for roughing or hard cutting, and are much cheaper than solid emery wheels. Specimens are shown which have been in constant use over two years and are still in good condition.

Otto Gas Engine Works,

Thirty-third and Walnut streets, Philadelphia, and 245 Lake street Chicago, make a large exhibit of their engines at H 31, Machinery Hall. Of these, one 100 horse-power, one 50, one 16, two 7 and one 1 horse are shown in operation. In addition, the exhibit comprises one 15, one 2 and one ½ horse-power gas engines, and one 17 horse-power gasoline engine. These engines may be run with an electric spark or a tube igniter, as preferred. In this exhibit both methods are shown. The tube igniter has patent controlled valves which regulate the time of ignition, prevent premature firing, and thus avoid starting backward. The electric igniter is also a patent device, and is not, as formerly, a perishable part of the machine. By an automatic arrangement the batteries are cut out every time the engine is stopped, and thus protected against running out while the engine is standing. The 50 horse-power engine is shown with a self-starter, which is a hand pump by which a mixture of air and gas is forced into a receiver, whence it passes into the cylinder and starts the engine without the application of hand power to the fly wheel. This was tested in the presence of the writer and required but three-fourths of a minute to get up full speed. The gasoline engines are adapted for use in localities where gas is very dear or cannot be obtained. One gallon of gasoline per horse-power will run an Otto gasoline engine ten hours. Otto gas and gasoline engines are also shown in the German department in Machinery Hall, and a 17 horse-power portable gasoline engine is exhibited in the Agricultural Building. There are now 40,000 Otto engines in use, having an aggregate of 250,000 horse power.

THE LETTER BOX.

Improved Furnace Top.

From A. L. BURTIS, *Lockport, N. Y.*—In *The Metal Worker* of September 23 I am pleased to find a criticism from A. W. Giessner on my furnace top, but judging from his letter I do not think he quite understands what my idea is. The iron standards he speaks of as being in the way are for the purpose of supporting the top independently of the sides, and as there would not be any cutting in of collars they certainly would not be in the way. He must bear in mind the fact that with this construction the different sections, some with collars and others without, are to be placed on the top and are made to slide around to any opening most favorable to the register. Where there are no openings required insert a blank. The sections could be made by machinery and finished with a nice-fitting damper with an air space, and could be carried in stock by the furnaceman as are elbows, register heads, &c.

Heating Room From Water Back.

From M., C. & S., *Towanda, Pa.*—Will *The Metal Worker* tell us whether or not a 5-foot range with a water side 22 x 10 inches and a fire box 22 x 12 x 10 inches deep will heat a 42-gallon boiler and a coil of 100 feet of 1-inch pipe with open pattern return bends, and an air cock at the highest point, as shown in the sketch?

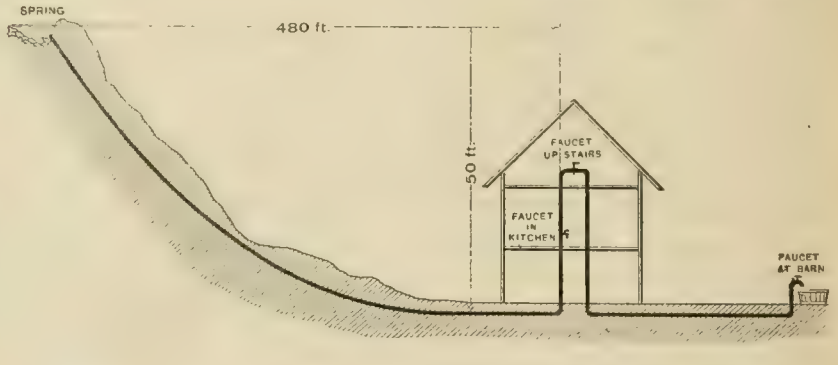
Answer.—It is not necessary to give the sketch, which shows the coil just above the level of the top of the water back in another room. From Y-branches in the pipes between the water back and the boiler pipes connect with the coil. The hot-water or flow pipe runs straight up to a point just below the top of the coil, when it runs to the coil with a gradual pitch. The return pipe has a downward pitch from the coil to the branch. The sketch shows a stairway between the coil and the boiler, which necessitates an offset in the pipes to pass it. An angle valve is placed at the inlet of the coil so that its use can be discontinued when not required for heating, and an air cock is placed at the other end of the coil. With this explanation of the conditions they are readily understood. No data exists giving the heating capacity of water sides, or water backs, as they are generally called, but much smaller water backs in smaller fire boxes heat the water satisfactorily in boilers twice the capacity mentioned. We think no trouble will be experienced from that source. When the room to be heated is on the floor above the range there is little difficulty in securing good circulation, but with the room on the same floor trouble is often experienced. Circulation is best when the radiator is well above the boiler, or, as in this case, the water back. The difficulty in the present instance can be remedied by connecting the flow pipe to the coil with the hot-water service at the top of the boiler or running it up from the branch nearly to the ceiling and then around to the coil before dropping down and making connection. The air cock must then be changed from the coil to the highest point in the flow pipe. Such a change will facilitate the circulation and better heating will result.

Difficulty With Pipes From Spring.

From A. & S., *Owego, N. Y.*—Can *The Metal Worker* or its readers tell us how to overcome the difficulties in these two separate jobs of plumbing on farms? In Fig. 1 the spring is 40 rods from house, with a fall of 50 feet. A ½-inch pipe runs from the spring into the house, through the kitchen to an upstairs room, where it returns and runs to the barn, with a faucet at each point. No water runs from the kitchen faucet when the upstairs faucet is closed. If the upstairs faucet is opened there is no trouble to get water in the kitchen, but the moment the upstairs faucet is closed the flow stops in the kitchen. How can we get water at both places at the same time when necessary, or in the kitchen when the upstairs faucet is closed?

On the second farm the distance from the spring and the fall are the same and there are faucets at the same points, the only difference being in the kitchen arrangement, which is shown in Fig. 2. Here a short return is made with a piece of 1-inch pipe. The supply from the spring connects at the top of this 1-inch pipe and at the bottom is the faucet and the pipe that leads upstairs, which then returns and runs to the barn, but in this case no water will run from any of the faucets. How shall we overcome the trouble and what is it caused by?

Note.—The piping in both cases is so arranged that air can collect in the loop that runs upstairs and returns and runs to the barn. In the second case the air pocket is duplicated in the arrangement in the kitchen, which would strengthen the belief that air is the cause of the trouble. This can be remedied by doing away with the loop and simply taking off a branch to supply the house faucets, when there will be no opportunity for the air to collect.



Difficulty with Pipes from Spring.—Fig. 1.—Arrangement at First Farm.

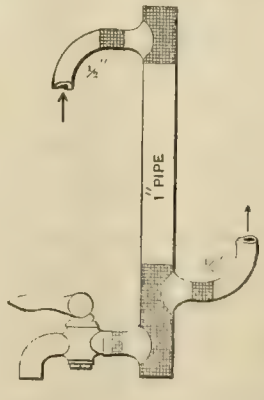


Fig. 2.—Kitchen Arrangement at Second Farm.

Single vs. Double Heating Pipes.

From CÆSAR, *Louisville, Ky.*—I noticed article of "W. E.," Orange, N. J., in *The Metal Worker* of September 16 in reference to wire lathing. In answer I would say that wood lathing in contact with heated pipes shrinks to such an extent that the plastering cracks from the floor to the ceiling. There is no other reason that I can find for using wire lath on well-made double pipes.

Water Backing into Sinks.

From C. P. J., *Dover, N. J.*—Can *The Metal Worker* tell me why the water backs up in a sink that has a 1½ inch pipe with a McClellan vent on it. When I take off the vent it will work all right, but when I put the vent on again it will work for three weeks or a month, when the water will back up in the sink again. It has done this three times and the pipe is clear. I would like to know the cause of the water backing up.

Answer.—There is nothing in the device mentioned that would locate the trouble described, but as it does not "back vent" it would permit the pipe

to become air bound in case of another trap on the same pipe, or, though the pipe is said to be clear, of some partial stoppage that might be the accumulation of hardened grease that reduced the bore of the pipe or of lint which would let the water filter slowly through. In either case the air in the pipe would be compressed and prevent the water received by the sink from running off though the sink became full. Removing the vent under such conditions would release the air, when the water would pass off with a rush that would remove any slight obstruction.

Remedy for Bad Flue.

From CÆSAR, *Louisville, Ky.* — I would like to hear from the practical readers of *The Metal Worker* the best way to improve a bad chimney. I have a contract to place a furnace in a store where there is a 4 x 18 inch flue built within a 13 inch wall. The owner of the building has never been able to get a common stove to work properly with the flue, which is practically worthless. The building is two stories high, and the chimney is 8 feet higher than the roof, and free from surroundings that would affect it. The chimney now stops at pipe hole about 5 feet above the floor, and it must be carried down to the cellar, but must be kept within the 13-inch wall. Can the flue be made to work without tearing out and rebuilding, and if rebuilt can it be kept within the space?

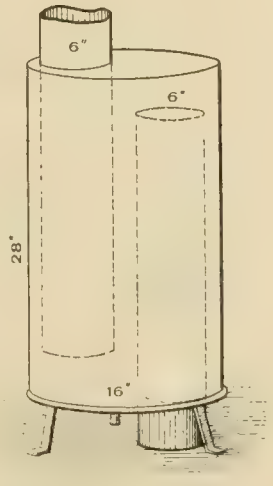
Note.—Experience has shown that wide, shallow flues, though they have a large area, are of little or no value. An 8 x 9 inch flue would have exactly the same area, and it is quite certain that not only the stove would work with it, but that a furnace connected with such a flue would render good service. It is doubtful if any remedy would make the present flue satisfactory except cutting out its face from top to bottom. This would give a space 8 inches deep, into which a terra-cotta pipe could be placed, and plastered over, making a finish. Terra cotta being rather thick, would hardly give a diameter of even 7 inches, which is rather scant, and it is probable that some of the manufacturers of such goods could supply a flue 7 x 13 inches, or some size that would come within the space. If it was not for the heat of the flue cracking the plaster, a 10-inch pipe, made of No. 18 or 20 iron and flattened to go in the space, would make a good flue. By careful building and plastering on sheet-iron lath this last trouble might be overcome and the flue kept within that space. Such a flue would last for years, and when the iron finally was destroyed the plastering around it would serve as a flue for a long time. These are but expedients we have suggested. The best plan is to rebuild the chimney and provide an ample flue.

Learning the Boiler Trade.

From F. A. K *Pennsylvania.* — I wish to learn if there is any trade school where the boiler trade is taught.

A Heating Drum.

From H. W. W., *Le Mars, Iowa.*— As it is time to think about getting up heaters I send herewith a sketch of a drum that I have made for 14 years and have found to be the best heat-saving device I have ever seen for hard coal or wood. I do not think drums can be successful with soft coal, as it fills them up with soot so quickly and they have to be cleaned so frequently. I make the drum of Russia iron, 28 inches high and from 14 to 17 inches in diameter, or of smooth black iron 24 inches high and 16 inches in diameter. I continue the pipe or collar on the bottom of the drum upon the inside to about 6 inches from the top and the outlet pipe at the top of the drum is carried down to within 6 inches of the bottom, as shown in the sketch. This brings the hot smoke to the top of the drum, so that a pan of water can be easily warmed, then the smoke gives off its heat to the drum as it falls to the



A Heating Drum.

bottom and passes off through the outlet. The legs are made of the straps that come around bundles of sheet iron and should be about 6 inches high.

Information Wanted on Laying Water Pipes.

From C. E., *Davenport, N. Y.*—I would like to submit the following questions for consideration in the Letter Box. Please explain how the sizes of water pipes are determined and how they are put in where there is a very great fall; are reducing pressure valves used or is a reservoir used part way down the system? How do such valves work? I ask these questions on a case where there is a large body of water at a great elevation. In laying pipes under such conditions is it a practice to use larger pipe near the supply? If so, how is it done, and why? In figuring on pressure what per cent. is calculated for friction on the side of a pipe? I am about to lay 150 rods of ¾ inch iron pipe with about 100 feet of fall. Will not the water run slowly at the lower end owing to the pipe being pretty small?

Answer.—The sizes of the pipes are determined by the quantity of water required and the method of its discharge—viz., if for a closed system the condition of velocity of flow under the maximum requirement and loss of head by friction are considerations of importance. If for a free flow with an open end pipe, the amount that will flow by gravity regulates the size of the pipe to the required quantity. There are two systems for high-grade water service: an open reservoir at the proper hight for a town supply with an open feed and overflow, or a closed single-pipe system with a regulating valve at the point of distribution. The later forms of regulating valves seem to work satisfactorily and many are in use on public and private water works.

The pressure in a water pipe is due only to the hydrostatic head or hight of the source of supply and not to the size of the body of water. This is equal to 0.433 pound pressure per square inch for each foot of vertical hight. The best practice in a water works system for the greatest possible flow of water is to graduate the line according to its length and hight into two or three sections, increasing by one gauge larger pipe, ascending, thus giving a free entrance of the water at the inlet so as easily to overcome the inertia of the water at the moment of entrance. To further facilitate the easy flow of water into the pipe the inlet end should be conical for a few feet, so much as to give the entrance about double the area of the pipe. These points do not affect the pressure at the delivery end when no water is flowing, but they largely increase the pressure when a large quantity of water is required, as for fire purposes, by lessening the friction and maintaining the greatest hydrostatic head under full flow.

The friction of water in pipe depends upon three factors—velocity, diameter and length of pipe, so that no single percentage will answer the question.

The formula for the head lost by friction is somewhat complex and stated as follows: Lost head =

$$\left(0.0144 + \frac{0.01746}{\sqrt{v}}\right) \times \frac{l}{d} \times \frac{v^2}{5.4}$$

in which v is the velocity in feet per second, l the length of pipe in feet, d diameter in inches. By this formula it is noted that the friction head is an inverse ratio of the diameter for given velocities —*i. e.*, the friction loss of a 1-inch pipe is twice as great as for a 2-inch pipe for equal velocities, but the 2-inch pipe will deliver four times the quantity of water at the same velocity and five and one-half times more with equal heads and free flow. The discharge from the ¾ inch pipe with length and hight as stated, with open end, should be 3.45 gallons per minute. The formula being, constant for ¾ pipe = 2.32 :

$$\sqrt{\frac{2500 \text{ feet}}{100 \text{ feet head}}} = \frac{2.32}{5} = 0.46 \text{ cubic foot} \times 7\tfrac{1}{2} = 3.45 \text{ gallons.}$$

If our correspondent's requirement should be somewhat more than above we recommend 1 inch pipe for one-third of the distance from the head, which will give an open flow of nearly 6 gallons per minute.

Furnace Setting.

BY PRACTICAL, SYRACUSE, N. Y.

It has come to be a saying among furnacemen that there are no two furnace jobs alike, and practically it is true. For there are circumstances and conditions connected with every job that differ from any other; hence the difficulties that many dealers experience in furnace work. It would be impossible, therefore, to lay down any series of rules for setting furnaces that would cover every particular job. But I think a few general rules and explanations may be given which, together with a little experience and ingenuity, will help the inexperienced out of some of their difficulties.

What I understand by furnace setting is the putting up of furnaces, with their pipes, registers, cold-air boxes, &c., complete, ready for use. As different classes of buildings require somewhat different rules for setting, we will consider in this article furnace setting in private houses. As the stacks (or partition pipes, as they are perhaps more generally known) have become a prominent feature in furnace work, and are usually the first and many times the most difficult part to put up, I will take up that portion of the work first. It is my experience that the best style of pipe to use, all things considered, is what is generally known as square pipe. As I gave a detailed description of the sizes most profitable to use, and the manner of making the same, in an article in *The Metal Worker* of March 12, 1892, we will assume that to be the style used. One of the principal advantages of that style of pipe is the convenience with which regular and special fittings, such as elbows, tees, offsets, &c., can be made, which is quite an important item where any amount of work is done; and by confining himself to one or two sizes of pipe the furnaceman can have a certain number of the regular fittings made up during the dull season and save much time when the rush comes.

To assist in the explanations of the use of the different fittings I have included in this article sketches of some of them. The names by which I shall designate them may not be familiar to all, but I trust will be clear enough to be understood. Fig. 1 is a regular offset, Fig. 6 a regular elbow, Fig. 4 a regular tee, Fig. 2 is what we call an irregular offset or an offset made to offset the pipe the narrow way, Figs. 7 and 5 are irregular elbows and tees respectively.

The irregular fittings are seldom used, but when wanted they are wanted as badly as if they were used every day. The regular offset is used, as its name indicates, to offset the pipe over a timber, either sill or floor timber, as shown in Fig 9. This figure represents the partition through which the pipe is run as standing on a cross timber. No builder would allow you to cut it off or notch sufficiently for the pipe, but by using the offset only a small part of the timber is cut; not enough to weaken it. As will be noticed, the upper part of the offset is made as short as possible in order to get it through the opening in floor over timber. The lower end is left long enough to extend below the floor timbers far enough to receive the collar, as shown. This is the collar to receive the leader from the furnace and should not be the ordinary straight collar, as the pipe being narrow would retard the easy flow of air from the furnace into it. It should be, therefore, a short tapering or flaring collar as shown in Fig. 8. Supposing the leader to be 8 inches, the collar should be 8 inches at one end and 9 inches at the other where it is let into the stack, and the collar short and the flare principally at the top, as shown. As will be seen, this collar can be placed on either side of the offset to suit the convenience of the leader; or if the furnace was so located that the narrow way of the pipe should face toward it then carry the leader along in front of the pipe and turn in collar with elbow; or else use a side inlet, as Fig. 3, using straight col-

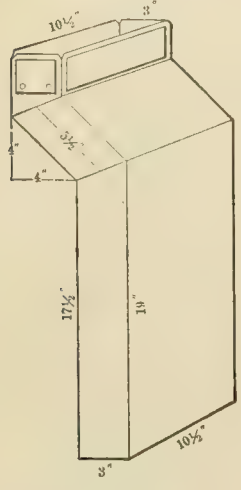


Fig. 1.—Regular Offset.

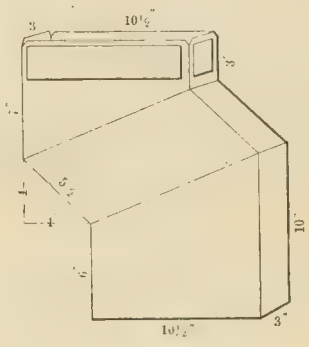


Fig. 2.—Irregular Offset.

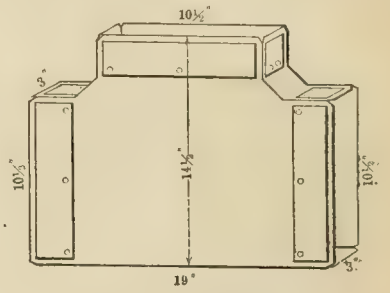


Fig. 5.—Irregular Tee.

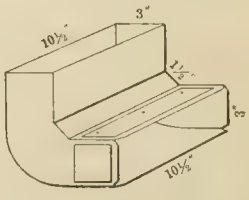


Fig. 6.—Regular Elbow.

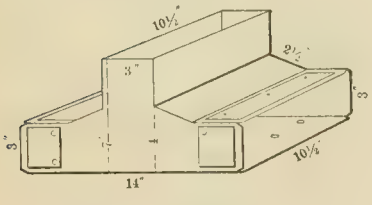


Fig. 4.—Regular Tee.

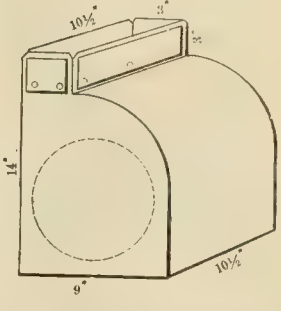


Fig. 3.—Fitting with Side Inlet.

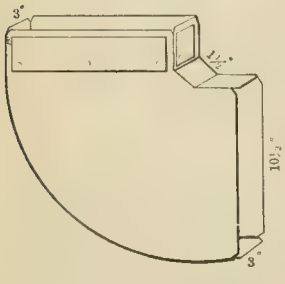


Fig. 7.—Irregular Elbow.

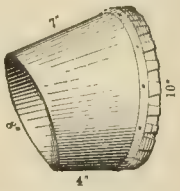


Fig. 8.—Tapering Collar.

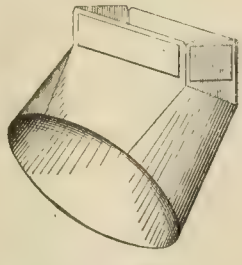


Fig. 10.—Bevel Inlet.

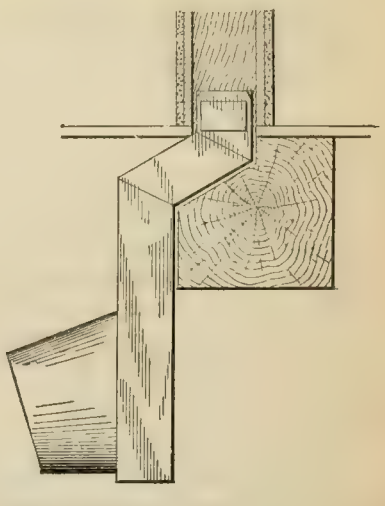


Fig. 9.—Offset Over Timber.

FURNACE SETTING.

lar in side, as shown by dotted lines. Another very convenient and practical fitting is shown in Fig. 10, which I call a bevel inlet. The use of this fitting will do away entirely with the offset and collar. It will require a little more cutting of the timber, but could not be used if the furnace was located so that the leader would run to it from the back side; but where it can be used it provides for a very easy flow of the air. As will be seen, this fitting is made square at one end, with a bevel and tapering to a round at the other. Of necessity it must be short, so that the leader entering it may come up close to the timbers. Of course pipes cannot be put up without cutting, more or less, the timbers and floors, and one of the objects of these fittings is to avoid cutting as much as possible, and at the same time get the pipes as you want them.

Furnacemen frequently come in contact with builders who are very particular about what cutting is done, and we have to manage the best we can to keep on their blind side. In cutting the holes for pipes they should always be cut at least 1 inch longer each way than the size of the pipe to be used, to allow for lining and air space. If the partition through which the stack is to pass runs across the timbers, you have simply to cut a hole through floor between the timbers and through the trimmer at top between the studs, and they are ready for the pipes. In this case no offset or bevel is needed, and the tapering collar can be used, or a straight inlet, Fig. 14. This is simply a short tapering piece of pipe, square at one end and round at the other, and the size required for the leader entering it at the bottom, with elbow at any angle with the furnace.

It is frequently the case, however, that the partition on second floor is not set directly over the one below. There are different ways out of this trouble. One is, if the distance is not too great, say 4 or 6 inches, to use regular offset and side wall register, as shown, Fig. 11 If the distance is more than that and you wish to use side register, use two regular elbows with short piece of pipe between, as shown in Fig. 15. If it is desired to use floor register use one elbow and carry over as far as required with pipe; close the end and use register head for floor register, as shown in Fig. 12 In either case, if the pipe runs between timbers give the horizontal pipe as much elevation as possible, but where it runs across timbers not so much can be given, as it would weaken the timbers to notch them the required depth. Hence a horizontal pipe running between timbers can be run further than one running across timbers But as a rule, good results cannot be obtained from a horizontal pipe running between floors further than 6 feet.

Again, it is often required to heat two rooms from one pipe; where side registers are used the same fittings can be used as in the previous cases by putting in two register heads, and where these are used there should always be a partition between them extending through the center of pipe from the top to 2 or 3 inches below the bottom of heads to provide an equal division of the heat, and also to prevent occupants of the rooms looking through from one room to the other. Where floor registers are to be used, use the regular tee, Fig. 4, and branch each way. These branches, to give equal results, should be of about equal length, or a partition placed in the tee extending down 3 or 4 inches into the pipe, or the branches of the tee can be made a little smaller than the upright. In all cases where two rooms are to be heated from one pipe, the pipe should be of larger size than for one room and the branches about one and one-half in total area the size of upright.

Another difficulty we find sometimes is that the studding in the upper partition is not set over those below, and we have to carry the pipe over the narrow way 4 or 5 inches; then comes into play the irregular offset, Fig. 2, and we get the pipe where we want it easily and without cutting or affecting the easy flow of air. Again, we find the only available space in the lower partition will come up under a door on second floor and we cannot run out with elbow and floor register, as that would bring the register directly in front of door, which should be avoided. In that case we use the regular elbow and carry over far enough to reach the first space in floor timbers, then with irregular elbow we turn at right angles and go far enough to clear door and use floor register, as shown in Fig. 13.

There are many other difficult places that the furnaceman will meet that these fittings will help him out of, or, if they do not just meet the case, they will suggest to him some special fitting that he can make that will.

In all furnace work avoid square angles and sharp turns. It is sometimes necessary to use a square pipe collar, but do not use a straight collar when a flaring collar, Fig 16, is easily made and will give much better results. Before any pipe is put up provision should be made for lining. There are different ways of doing this. Some line with tin and some with asbestos paper, and others with both. Where tin lining is used all wood work that is exposed to the pipe is supposed to be covered. One way of doing it is first cut enough strips 4 inches wide the 28 inch way of the sheet, cutting one from each sheet, to line the inside of the studding both sides from top to bottom, then put up the pipe, beginning at the bottom, fastening the fitting, if any is used, firmly in position first. Then connect pipe and put up complete, being sure that it is fastened firmly and all the connections soldered as tightly as possible. Then, using the balance of the sheets from which the strips were cut, which will be 16 inches wide, nail over the space between studding.

Another way of lining is instead of cutting off the strip bend up to 4 inches on each side of the sheet, square and nail between studding, thus forming the lining for the studs and one side at the same time. However, I do not think it gives an opportunity of putting up the pipe as well as the other. Where asbestos paper is used for lining, the usual way is to wet the paper in water and wrap it tightly about the pipe, and when allowed to dry it will stick. Some, to be more sure, put it on with paste. Care should be taken in putting up the pipe to see that it is not jammed or turned in at the connections, thus reducing its capacity; for no matter how large the pipe may be, its capacity for delivering air into the room is determined entirely by its capacity at its smallest point.

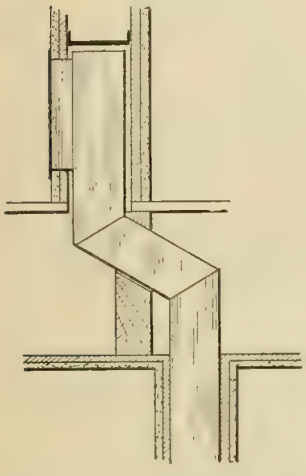


Fig. 11.—Offset and Side Wall Register.

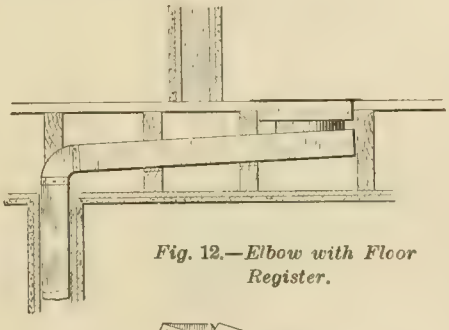


Fig. 12.—Elbow with Floor Register.

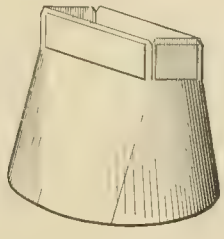


Fig. 14.—Straight Inlet.

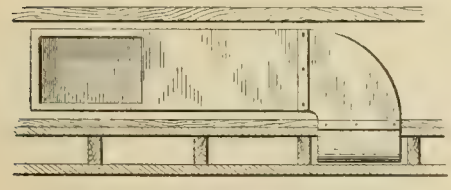


Fig. 13.—Plan Showing Use of Regular and Irregular Elbows.

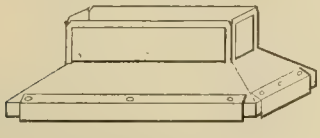


Fig. 16.—Flaring Collar.

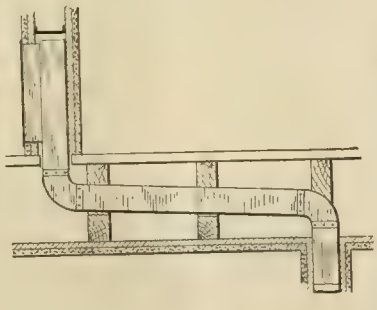


Fig. 15.—Two Elbows with Pipe Between

FURNACE SETTING.

PLUMBING and GAS FITTING.

Back Venting.

From THOMAS HYDE, *Albany, N. Y.*— I have been reading with a great deal of interest the discussions, pro and con, on back air venting. The principal argument used, the danger from evaporation by the velocity of air passing through the ventilating pipe, and the greater the velocity and evaporation there was, the greater the danger is considered. The caliber of the parties discussing this subject is such that I don't desire to take issue with them, but simply want to ask a few questions. If, as is stated, in regard to the high velocity in high buildings the velocity becomes so rapid, what harm can come to the occupants of a room where the trap of an apparatus has been unsealed? How could anything but good results come out of it? Would not the air from the room pass down through the trap and help to purify the air of that room rather than permit the foul air from the sewer to come in? This, it seems to me, would be the case Where a back air vent is properly located a constant current must pass up through it. In the second edition of Hellyer, page 279, I find these words: "The work of the sanitarian will never be done until he can so scheme, either with or without mechanical appliances, that a constant change of atmospheric air shall be made to take place not only in every bedroom, living room, bathroom, water closet and housemaid's closet, but also in every waste pipe, drain or closed space where the air is likely to become contaminated." After reading the above I set to work to bring about that condition of things in my own house, and the result is that I have no fear of sewer gas entering my apartments. I proved this many times by severe tests, and have followed that rule in many places since, always proving a trap to be really unnecessary. In regard to the stopping up of the back air vent with soap suds, grease, &c., as stated, I believe that there is not so much of it as is imagined.

Newark Plumbers.

On Tuesday night, September 26, in response to an invitation from the Master Plumbers' Association of Newark, N. J., a large number of the plumbers from Essex County attended a special meeting, the object of which was to make preparations to join the National Association. Vice-President John Mitchell of the National Association was present, supported by Edward Murphy and others from New York. The meeting was generally regarded as a success, and there is little doubt but these plumbers will be enrolled as members of the national body at an early date. The meeting dispersed to a banquet spread by Caterer Isaacs, where as many good things were delivered by the orators as were devoured by the silent worker, who wore his honors with a satisfied composure.

AT A RECENT MEETING of the master plumbers of Cambridge, Mass., J. T. Phelan of Harvard Square presided. The Master Plumbers' Association was organized for mutual protection and the advancement of matters of common interest.

TRAPS AND VENTS.

FROM A SERIAL ARTICLE contributed to a London exchange we quote the following paragraph sketching the condition of plumbing in England before modern progress got hold of it: "Thirty years ago in many towns of the United Kingdom one, two or three firms of good old-fashioned substantial plumbers flourished, following the substantial plumbing practice in their trade, and charging old-fashioned substantial prices for good, sound work. Handmade solder-seamed lead pipes, bends, and traps were made by easy-going plumbers in the workshop when work was slack, filling up time nicely until orders came in again. D-traps were esteemed and pan water closets honored by the observance of the plumbing trade. Ventilation of soil pipes and waste pipes was quite neglected or unknown. The drains were laid by the builders' laborers or masons in whatever shape or form came handiest, and the plumbers connected their pipes direct to these drains free from all thought of responsibility."

WILLIAM L. WHIPPLE, Manton avenue, Olneyville, R. I., is busy with plumbing work. His men are now working on three new residences.

A. F. POWERS of Boston has secured a store in East Braintree, Mass., and will open it as a plumbing and gas fitting establishment.

WE LEARN FROM JOHN FORAN, iron founder, maker of sinks, soil pipe, fittings and plumbers' supplies, that he has purchased the Flemington, N. J., foundry property formerly owned by Robert Johnson, and will remove his Quakertown plant there in a few weeks.

THE MALDEN, MASS., BOARD OF PLUMBING Examiners consists of Chairman John E. Staples of the Board of Health, Inspector of Buildings C. N. Bishop and B. O. Tilnen, who is a practical plumber. An effort was made to secure some practical plumber for plumbing inspector, but as the law requires him to give up business none could be found to accept the offer under $1200 per year, and the inspector of buildings will attend to these additional duties for an increase of $200 to his present salary. The board announce they are ready to begin the examinations and the plumbers must pass or discontinue business in Malden.

A NEW COMPANY recently incorporated for the manufacture of plumbing supplies is the Daniel McKay, Jr., Company of New York.

"A PAIR OF NIPPERS and half a dozen 18-inch gas-burner tips," was the order given by a jaunty young woman who visited an up-town plumber's shop the other day. "That lady," said the proprietor after her departure, "is an actress, and is just going on the road. All theatrical people while traveling carry nippers and tips with them. The managers of hotels in small towns try to save gas by putting bits of cotton in the bedroom burners, thus impeding the flow. The minute the actor strikes a light and detects this he pulls out his nippers and tips. Off comes the 'faked' burner and on goes one that lets the full head of gas come through. Before leaving he arranges things as he found them and goes merrily along to get the better of the next economical landlord on his route."

THE BUILDING INSPECTOR of St. Paul, Minn., finds that the city is losing a considerable revenue through the plumbers failing to take out permits for doing their work. The fee for the permit should be collected from the owner of the building and in future the inspector will be more stringent in requiring the plumber to take out his permit, in order that the city may collect its fee.

THE JOHN D. PAGE COMPANY have recently been incorporated, with a capital of $2000, to do a general plumbing business, with an office in New York City.

AMONG THE PROMINENT PLUMBERS whose names appear on the register at Peck Bros. & Co., 259 Wabash avenue, Chicago, are the following: Edward D. O'Connor, Louisville, Ky.; James McGauly, Indianapolis, Ind.; Alex Gray, Kansas City, Mo.; Fred Lamping, Cincinnati, Ohio; James Foley, Leavenworth, Kan.; Fred P. Terry, Ansonia, Conn.; E. McNalley, Oswego, N. Y.; Tobias Ruheudel, Columbus, Ohio; W. B. Coffee and Wm. Welsh, Tacoma, Wash.

TREASURER E. W. ANTHONY of the Smith & Anthony Company, Boston, manufacturers of the Sanitas plumbing specialties, recently paid a visit to Manager C. E. Stevens, at the New York office at 56 Beekman street.

A FEATURE of the Nautilus water closet, made by the W. S. Cooper Brass Works of Philadelphia, and displayed at their New York showroom, at 43 Beekman street, is the seat, which is secured to the closet and balanced by weights so that it stands upright when not in use.

THE CHICAGO MASTER PLUMBERS held their regular meeting at their hall, 197 Madison street, Monday evening, September 25. A feature of the meeting was a discussion regarding the advisability of having a certain day at the World's Fair for the plumbers, gas fitters and kindred trades. The matter was not decided.

MAYOR HARRISON has notified T. P. Culloton, M. J. Carboy, D. J. Rock and A. W. Murray, prominent plumbers of the city, that they are to serve on the Finance Committee of the Chicago Labor and Temporary Relief Committee.

J. L. ELLIOT has purchased the plumbing, gas fitting and sewerage business of A. F. Bock, 272 Fifty-fifth street, Chicago.

THE RECENT FAILURE of Louis Roller, 161 St. Nicholas avenue, New York, is the subject of considerable talk among

the trade. While the amount of his indebtedness is quite large, several firms being creditors for from $1000 to $4000, the finding that he has forgde several notes is the cause for disagreeable doubts in some houses. An $800 note in one case that was found to be good gave considerable relief.

THOS. H. RADCLIFFE, president of the Brooklyn Association of Master Plumbers, is making an effort to get the plumbers of Long Island together for the purpose of forming an association.

THE WILMINGTON, DEL., plumbers are about organizing an Association of Master Plumbers to affiliate with the National Association.

THE SCHOOL BOARD OF ATHENS, N. Y., recently voted to appropriate $1000 for a steam heating apparatus for one of the schools.

THE BOARD OF HEALTH of Springfield, Mass., are revising the plumbing ordinances of the city to conform with the new State law.

THE PLUMBERS OF MACON, GA., are making earnest efforts to have the city authorities appoint a regular plumbing inspector. They also wish an examining board of plumbers, so that no one can do plumbing work unless he is qualified. The plumbers intend to bring this matter to the attention of the Board of Health at its next meeting, in order to prevent a continuance of the defective work which is found in many houses and stores in that city.

THE BOARD OF HEALTH of Rutland, Vt., has been making an inspection of the sanitary arrangements of the buildings in that city and has found much that will require changing, and it is possible that some plumbers, as well as citizens, will be brought before the court for violations of the city ordinances relative to the plumbing and sanitary arrangements.

THE NEWARK LEATHER WASHER MFG. COMPANY, 165 Mulberry street, Newark, N. J., make a specialty of valves and plungers for pumps and leather washers for unions for plumbers' use.

THE ESSEX LEAD WORKS, 46 Mechanic street, Newark, N. J., have found a satisfactory demand for their special make of lead pipe and line of plumbing supplies all through the season.

W. B. EGBERT & Co., 35 Mechanic street, Newark, N. J., carry a large line of plumbers' specialties and supplies, and find the trade in a very satisfactory condition.

ON THURSDAY, SEPTEMBER 28, P. H. Gavin, a well-known plumber of Quincy, Mass., died at the age of 48 years. He served in Company D, Thirty-ninth Regiment of Massachusetts Volunteers during the war and was a member of the Paul Revere Post G. A. R. He was one of the yachtsmen of the Quincy Club and a member of the Knights of Pythias. A wife and nine children survive him.

A SPECIAL JOINT MEETING of the Board of Health and Board of Plumbers at Rome, N. Y., recently, resulted in the adoption of a code of rules to govern plumbing and drainage in that city.

THE WILLIAMS BROTHERS, Crawfordsville, Ind., have moved their plumbing establishment to their new room in the Crawford Block.

Portable Drilling Machine.

The accompanying illustrations represent a portable drill sometimes called Scotch drill, which is being introduced by O. C. Crane, No. 16 Bridge Arch, Frankfort street, New York. As shown in Fig. 1 the clamps may be fastened to a bench, beam or other object 6 inches thick, or less. The standard is held in

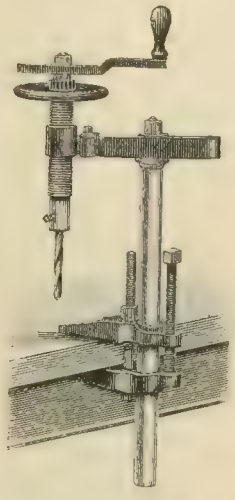


Fig. 1.—Portable Drilling Machine.

the clamps by set screws with jibs, which is an advantage in applying the drill to the work, as they allow the standard to be moved through the clamps without loosening the clamps from their place. The standard is made of pipe of 1½ inch diameter, 21 inches long, thus combining lightness with rigidity. The drill spindle is of steel ⅞ inch in diameter, and runs in

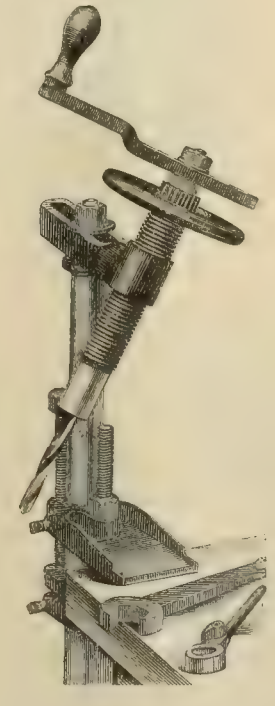


Fig. 2.—Used at an Angle.

composition bushings in each end of the feed screw. It also has a ratchet at the top supplied with a pawl wrench which is substituted for the crank when working in contracted places where there is not room enough to swing the crank. The crank can be adjusted from 3¾ to 8 inches radius. The feed screw nut is fitted with a clasp joint, allowing the drill spindle to be turned to drill at any angle as in Fig. 2; and is threaded to prevent the feed screw nut from being lost out when the clasp is loosened. The clamps are grooved on the inside as shown in Fig. 3, to hold more securely on the edges of I beams or channel bars when drilling structural work. A triangular piece is furnished to use on the taper side of the flange when necessary. A wrench to fit all the nuts and screws is furnished with each machine; all the parts of which are of steel or wrought iron, the total weight of the machine being 29 pounds. The manufacturer claims that the machine is capable of drilling a ⅝ hole 3½ inches deep, at any angle within a radius of 9 inches. The point is made that the advantage of a portable drilling machine that is both light and strong, and

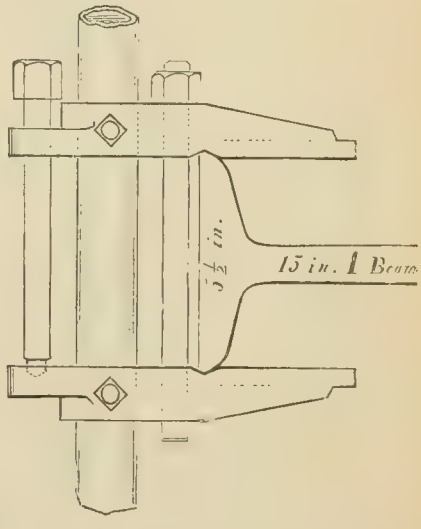


Fig. 3.—Clamped on an I-Beam.

easily applied, is apparent to every one who has had experience in machine building. A No. 2 drill is in course of preparation, of the same size as the machine herewith described, but lower in price and slightly different in construction.

The President of the Argentine Republic has presented to his Congress a very favorable report and forecast of the financial condition of that State. So satisfactory are the finances that it is proposed to largely reduce the duty on tobacco imported from the United States, this source of revenue having been more than counterbalancad in the increased exports of Argentine wheat to Europe. The production of wheat has been very great this year, and during the first six months of 1893 the United States and the Argentine Republic were the largest contributors to the wheat supply of England. Late cable advices from Buenos Ayres speak of serious revolutionary troubles in the Argentine, which may, however, upset all calculations, financial and otherwise, for the coming year.

The oldest engineering society in existence is believed to be the Smeatonian, founded in the last century by Smeaton, one of the pioneer engineers of England. It is still carried on, and was represented in the recent Engineering Congress in Chicago by Sir Benjamin Baker.

ROOFING AND CORNICE.

Corrugated Iron in Australia.

Mention was made in a former number of this journal of the adoption of corrugated iron for school buildings in portions of Australia where the shifting character of the country population made the frequent moving of such buildings necessary, in order to place them as nearly as possible in the centers of the inhabited districts. The *Australasian Ironmonger*, in a recent issue, publishes some further information on this subject, which is of interest. Mentioning the difficulty experienced for many years by the South Australian Government in the proper provision of school-house accommodation for the outlying districts of that colony, the *Ironmonger* says: The farmers here, after working new ground for a few years, move away to unworked ground, generally further north or to the west coast. Under the circumstances it was not policy to erect stone or brick buildings, and the teachers and scholars had to put up with the ordinary wooden buildings, and these were often unpleasantly hot, and, through shrinkage, dust and wind (hot and cold) was admitted. Galvanized iron, payed over on the outside with lime wash, was next tried, the inside lining being of wood. The result was more satisfactory, but still left something to be desired. Owen Smyth, the superintendent of public buildings, next tried the small fluted 28-gauge galvanized iron for internal sheathing in lieu of wood, with ample inlet and exhaust ventilation, and had both sides of the external and internal iron payed over with a special composition of fresh lime, boiling water, sugar and salt. By this means the radiation of heat from the bright galvanized iron was practically stopped, and the result was a neat, clean and healthy building, cool in any but the hottest weather, and even then never ranging above shade heat; while at nights the rooms are beautifully cool (comparatively), besides being fresh and sweet—very different from stone or brick buildings after a bout of hot weather. There is now erected in one of our city State school yards a model iron school room, with ventilation and comfort assured, surpassing in this respect many of the stone or brick buildings. Specially large ventilators carry off the vitiated air through the roof; the fresh air finds access through the ventilators fixed at about 7 feet 6 inches from the ground level; also, if required, from the swing sashes. Owen Smyth has provided a cheap and healty building, with the temperature never more than that of shade heat and frequently much cooler. This building has the advantage that it can always be shifted to another site at a small cost.

A CORRESPONDENT in Chili, writing to a London journal, states that the galvanizing works just established at Valparaiso have been successfully started, and the first galvanized corrugated sheet ever produced in the history of the country was made in the presence of the Mayor and a large company. The proprietors are so satisfied with the prospects of the business, for which they hold the sole concession in Chili, that they have decided to augment the plant, and the works will soon produce 200 tons per week. In addition to this, 12 machines for making gutters, pipes, ridging, &c., are in active employment.

O H One-Piece Conductor Elbows.

We show in the accompanying illustrations views of the plain, round and corrugated O H one-piece conduct elbows, made by the Lawrence-Letts Elbow Company, Limited, Waverly, N. Y. Fig. 1 shows their No. 1 elbow plain, Fig. 2 shows their plain round shoe, Fig. 3 the corrugated elbow, and Fig. 4 the corrugated shoe. They are made of tin plate and galvanized iron. In addition to the styles shown there are also two other elbows of different angles in both plain and corrugated material and which are designated as Nos. 2 and 3 respectively. The manufacturers refer to the round elbows as being made on a true curve and offering the least obstruction to the flow of water, thus rendering them less liable to become obstructed, while the corrugated elbows permit of ample expansion and have no soldered joints to come apart. The further point is made by the manufacturers that there are no flat sides on the corrugated elbows and no corrugations left out for the tinners to shape up by hand in making connections. The galvanized iron elbows are completely formed before galvanizing, which gives them an even coating. They are made from No. 28 gauge and will compare in weight with IX leader pipe.

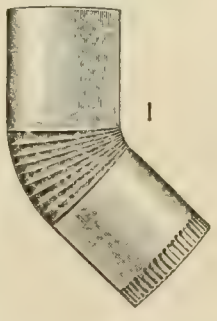


Fig. 1.—No. 1. Plain Elbow.

Fig. 2.—Plain Round Shoe.

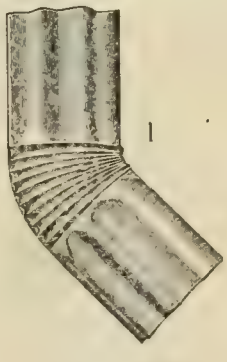


Fig. 3.—No. 1 Corrugated Elbow.

Fig. 4.—Corrugated Shoe.

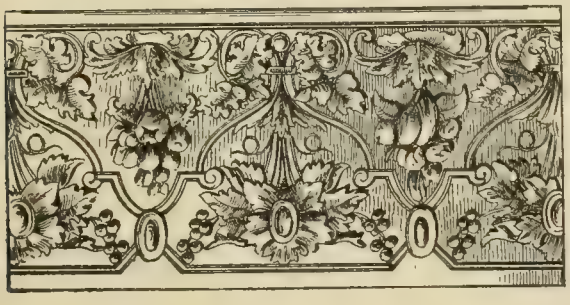
THE O H ONE-PIECE CONDUCTOR ELBOWS.

THE CINCINNATI CORRUGATING COMPANY, Piqua, Ohio, issue a new illustrated catalogue of their products. The volume, bound in scarlet paper, opens with general views of the company's plant, which comprises a rolling mill, galvanizing works and tin-plate works. The goods made by this concern include the following corrugated products: Roofing, siding, ceiling, arches, lath, shutters and doors; also V-crimped iron roofing, standing seam plain roofing, roll and cap steel roofing, metallic weather boards, ridge capping and beaded metallic ceiling. They also make roofing plates and galvanized sheets known under the brand of Piqua. The firm are prepared to furnish estimates on metallic material for buildings, including cornices, gutters, conductor pipe, &c. In an introductory note to the trade they tell their reasons for moving to Piqua and the advantages that they there possess. The catalogue gives illustrations with descriptive particulars of the various products that have been referred to, and the whole is put up in a compact and convenient shape, and will be of interest to those handling sheet metals. Accompanying the catalogue is a little pamphlet issued by the same concern, entitled, "The Life of an Iron Roof," consisting of a

series of letters from those who have used this material, showing how it has endured for many years, some of them giving records of over 50 years.

New Designs in Sheet-Metal Work.

We show in the accompanying cuts illustrations of embossed metal work made by the Kn x & Stonier Architectural Sheet Metal Ornament Company, Toulon, Ill. The designs reproduced in the illustrations are new, having been on the market but a comparatively short time, and are stamped in zinc, copper or sheet steel. The zinc and copper are used on cornices and for



New Designs in Sheet-Metal Work.

similar work, while the sheet steel is intended for ceilings and other interior work.

FLASHINGS.

SEALED PROPOSALS will be received at the office of the Supervising Architect, Washington, D. C., until October 17, for the labor and materials required for the cut stone work, iron work, wood floor, ceiling, roof construction and roof covering for the United States Custom House and Post Office building at St. Albans, Vt., in accordance with drawings and specification, copies of which may be had at the office of the Supervising Architect, Washington, or from the Superintendent at St. Albans, Vt.

SEALED PROPOSALS will be received at the office of the Supervising Architect, Washington, D. C., until October 18, for the labor and materials required for the trench excavation, foundations, stone and brick masonry, cut stone work, wood floor, ceiling and roof construction, roof covering and approaches for the United States Post Office building at Rockford, Ill., in accordance with the drawings and specification, which may be obtained from the Supervising Architect at Washington or from the Superintendent at Rockford.

THE IMPETUS given to the sheet-rolling industries of Eastern Ohio during the past two weeks continues, but its force is not increased. The sheet mills at Niles, Canal Dover, New Philadelphia and Cambridge are in operation, but the order files do not present a bulky appearance. If it were not for a fair demand for galvanized sheets matters would be dull in the territory named. Iron and steel roofers are doing some business and in this line it is reported that the demand for galvanized stock shows a marked increase. Several concerns have curtailed their expenses by calling in traveling men, and do not expect to send them out again this season.

English journals announce a new social experiment which is about to be made by a band of Australian colonists in South America. Two hundred persons have left Sydney for Paraguay, and some 800 are to follow. They have an initial income of some $300,000, and propose founding an ideal farming and industrial community. There is to be no distinction of sex in the colony; every member is to have an equal share in the general property and equal voting power, while the only form of government will be a director, elected by two-thirds majority, aided by a kind of advisory board chosen in the same way. Why they have come all the way to Paraguay when there is so much unoccupied land still available in their own continent is not stated.

Prize Competitions.

IN CONNECTION with the movement among Hardware retailers with a view to forming an organization for the protection of their interests Competitions Nos. 26 and 27 are of special interest. Competition No. 26 relates to the question as to the extent to which manufacturers and jobbers are justified in selling to consumers, and the papers we have received look at the matter from the different standpoints of the parties in interest. The committee to whom the papers were referred have awarded the prizes as follows:

First Prize to A. D. BANKER.
Second Prize to J. E. JANSSEN.
Third Prize to E. G. LUFKIN.

Prize Competition No. 27 is in regard to local organizations of Hardware merchants, and the opportunity thus given for an understanding or an association among the retail merchants in a town or city with a view to the protection of their interests. The scope of such associations, their difficulties and advantages, are considered, and the subject as a whole has been covered in an able and interesting manner. The committee to whom the competitions were referred have awarded the prizes as follows:

First Prize to A. H. HOPE.
Second Prize to F. H. WOODWORTH.
Third Prize to J. ROBERT RAINEY.

After several years' experiments the Lighthouse Board has been successful in establishing electric communication with lightships and lighthouses placed at a distance of more than a mile from the shore. The difficulties which have hitherto prevented connecting by electric cable a vessel swinging at anchor at sea with the land are said to have been overcome by attaching the core of the cable to the anchor chain and making a conductor of the latter. The leakage of electricity produced by the water has also been reduced to a minimum. Telephonic communication has been established with some off-shore light vessels, and it is intended that all shall be similarly connected with the shore. This will prove the means of a great saving to the shipping interests of this country, as life-saving stations will be quickly and easily communicated with in cases of emergency.

Nearly 4,000,000 rupees are to be expended in India immediately on new railroads, and it is intended to link all the lines so as to form, as far as they go, a complete network of railways. Indian railways are under the control of the Imperial Government.

Quite a large number of orders for vessels were placed with the Clyde shipbuilding firms during the month of August, causing an appreciable improvement in the condition of that industry and allied trades in Scotland, after a prolonged spell of dullness.

TIN PLATES.

The Tin-Plate Report.

From JAMES B. SCOTT & Co., *Pittsburgh, Pa.*—We would rather enjoy your comments in *The Metal Worker* of 16th inst. respecting the information given out by the Bureau of Statistics were not the evident twisting of reports too serious to be laughed at. Possibly all American manufacturers may take earnest exception to this report. We speak for our own interests, as embraced in our own factory in this city and the plant of the Blairsville Rolling Mill & Tin Plate Company, at Blairsville, Pa., the entire output of which we market. We know of no theory from which it is proper to speculate upon annual output upon the basis given in this report. At Blairsville was erected an entirely new plant, consisting of hot and cold rolling mills, heating and annealing furnaces and pickling machines, together with a complete tinning house. This plant only began practical operation in the quarter ending March 31, 1893, and to make an estimate of its annual capacity (as attempted in this report) upon the basis of three and one-half times the actual output of the quarter, most of which was passed before the actual completion of this plant, is evidently improper. As the Bureau of Statistics had in hand long since the actual returns from the quarter ending June 30, it may be pertinent to inquire why same are not published. We may state that in a single month of the quarter ending June 30, we delivered from Blairsville to consumers a quantity of finished plates in excess of this Bureau of Statistics' estimate of the annual output of this mill. Every sheet coated at Blairsville is rolled in the mill there, the out put being the product of a complete American plant. Within a few days the additional mill erected at the Blairsville plant has been put in operation, thus giving at the present time a daily output of 300 boxes.

From MERCHANT & Co., *Philadelphia, Pa.*—We notice in *The Metal Worker* a report of the domestic manufacture of tin and terne plates. We are pleased to note that in publishing it you take the opportunity to state that it is more or less inaccurate. As far as our firm is concerned the statements are inaccurate—indeed, are ridiculously so. For instance, our capital invested is put down as $2000. As this represents just one-fifteenth of the cost of the real estate on which our works are erected, to say nothing of buildings, machinery, &c., it is needless for us to comment further on the value of such reports to the public.

A SAMPLE of tin from the new Mount Wills South Mine in Victoria, Australia, was recently sent to Melbourne to be practically tested in use, with the result that after being tested in several different ways—making solder, tinning and also for the manufacture of white metal—it was found to be of excellent grade.

The British Tin-Plate Trade.

The tin-plate trade in England just now seems to have reached a depth of dullness almost unexampled. Although the coal difficulty in Wales, caused by the miners' strike, is practically adjusted, tin-plate manufacturers seem unwilling to resume operations under existing conditions. It is stated that they find it almost impossible to produce plates that will cover their cost under the ruling prices, and they cannot get better prices, notwithstanding that production has been so much curtailed. This is accounted for partly by the fact that the American demand has fallen off so largely on account of the possibility of changes in the tariff, which makes importers chary of laying in any large stocks, that stocks in England are larger than usual. The situation in South Wales was thus stated by the Swansea correspondent of the London *Iron and Coal Trades Journal* on September 9: The Swansea district has yet scarcely begun to recover from the strike. A few days ago it was reported that there were 18 tin-plate works idle in South Wales and Monmouthshire, namely: Abercarne, 7 mills; Aberdare, 3; Abertillery, 9; Blaina, 10; Clydach, 3; Dynevor, 6; Foxhole, 4; Garnant, 3; Llangennech, 6; Llwydarth, 4; Melyn, 7; Nantyglo, 7; Pontymister, 10; Panteg, 6; Penclawdd, 4; Pontardawe, 10; Tirydail, 3; Ystitty, 4. These contain 106 mills and give employment to nearly 4000 people. The majority of the works have had to cease operations owing to the scarcity of coal; at others there are disputes unfortunately pending. At the Pontardawe works nearly one-third of the mills have since restarted, and at some others preparations are being made to resume operations, but some time must elapse before all are at work again. Though large quantities of coal are beginning to come down from the pits, most of it is required for shipment under contract. There is very little available at present for the market, and what little there is commands such high prices that, as a rule, tin-plate makers do not care to restart their works until they are able to buy at something like the old figures. A month's notice to terminate contracts was posted at the Vernon Tin Works, Briton Ferry, on Monday last, and at the works of Messrs Morewood & Co. the men are on the day-to-day system.

At present the shipment of tin plates about keeps pace with the production. Last week the shipments amounted to 53,525 boxes, while the number of boxes received from works was 58,910. Stocks are very heavy just now, amounting to 261,384 boxes, as compared with 144,181 boxes at the corresponding date of last year. Prices remain about the same as last week, the restriction of make caused by the stoppage of mills having had no stimulating effect on prices.

The Glamorganshire and Monmouthshire tin plate works are also stated to be for the most part idle, and some 6000 or 7000 work people have been wholly or in part thrown out of employment in the tin-plate districts.

The Tin Mines of Perak.

The Malay Peninsula, as is well known to our readers, contains some of the richest and most extensive tin mines that have yet been discovered. At present some two-thirds of the world's supply of the metal comes from that country and its adjacent islands. The former is known to commerce as "Straits" tin, from being shipped at certain ports on the Straits of Malacca, known as the "Straits Settlements." Certain portions of the Peninsula are naturally more productive of tin than others, and Perak stands at the head in this respect. An account of the tin-mining industry as carried on in that State will therefore be of interest. The *Engineer* of London recently published a full description of the Perak mines and the methods there employed, from which we extract the following details, which will serve to amplify former information given in these columns regarding the two mines of the Malay Peninsula.

MALAYAN TIN DISTRICTS.

The stanniferous area in those regions is estimated to have an extreme length of 1200 miles, and few portions of Malaya are destitute of indications that the metal exists beneath the surface. Singularly enough, the whole product as yet met with consists of alluvial ore, known as "stream tin," and is obtained by simply washing the soil after the superincumbent layer of clay or gravel has been removed. McCullough, in his "Dictionary of Commerce," makes the somewhat misleading remark that "no attempt has hitherto been made at regular mining or obtaining the ore from its rocky matrix;" misleading because as yet such matrices remain undiscovered, although natives occasionally aver that they have seen large lumps thus procured. As the local governments have offered a fair reward for any information as to the existence of reefs, it seems hardly probable that the Malays, who prefer to make money in any way rather than by hard work, would have neglected such a chance. Practically speaking, at all events, the tin of the country is derived exclusively from tin sand.

THE KINTA DISTRICT AND RAILROAD.

Perak, a semi-independent State, ruled by a native Rajah, under the protection of the British Government, is situated about half way down the Malay Peninsula on the Straits of Malacca. The richest tin district of the State lies a little to the eastward of the right branch of the Perak, or Kinta, River, and is known as the Kinta district. This district has been lately brought into prominence through a line of railroad, the first yet constructed in this portion of the far East, having been opened in it. The line has been built under British auspices, and it is expected to revolutionize the carrying trade of the country, and especially to promote the tin-mining industry, which

is its chief resource. At present the line only extends from the port of Teluk Anson, across the River Bidor to a place called Tapah, but it will ultimately be extended through the entire tin district.

CHINESE MINERS.

The great industry which the new railway is chiefly designed to serve is carried on in a similar way throughout the country, so that a description of the methods pursued in Perak applies to Malayan mining generally. It must not, however, be supposed that the Malays are the miners of the place. A few "ancestral mines," namely, mines which have been worked by their fathers and forbears, are indeed in Malayan hands. But the great majority of the working class in the Peninsula—as, indeed, everywhere else, if they can get a footing—are Chinese. Untiring in his toil, sober, to be relied on if well treated, and willing to work for wages on which any one else would starve, while his chief vices—gambling and opium smoking—are only indulged in when the day's toil is completed, Ah-sin and his friends are the pioneers of the Eastern world. It is usually agreed that the miners shall receive a share of the profits made by each mine, the small sums paid them meanwhile being treated as advances from the amount finally due.

PRIMITIVE METHODS OF WORKING.

Let us see how the Chinaman sets about opening a mine. It seldom happens that the would-be tin digger is a man of means. He therefore goes to some richer friend who agrees to advance the necessary money upon condition that the metal obtained is sold to him exclusively, and that all the tools, food, opium, and anything else required is bought from him. We assume that the digger has obtained a yearly license, but if not, he can for a small fee get the ground he proposes to work surveyed and staked out, and upon payment of $1 be entitled to work it for 12 calendar months. These preliminaries settled, the next question is plant. It is very simple. Firstly, a number of changkols, or native hoes, must be obtained, according to the number of men it is proposed to employ. This serviceable tool becomes in Eastern hands the equivalent of spade, hoe, and rake—to say nothing of its uses as a weapon of offense. The next articles to be got are a sufficient number of bakols and ragas, or baskets. The ordinary earth carrying basket is known by the former name, but the three varieties used only in mines by the latter. They are spoon shaped, with two handles, and are made of an open-worked sort of wicker, so as to act as a sieve when lifting stones or dirt out of the mine. When the tin-bearing stratum is actually reached a sort of wooden spade is used in place of the chankol to work up the sand. The next necessity is to provide wooden planking to build the waterways, as without water no mine is workable. The stream thus obtained turns a rudely-made undershot water wheel 4 to 5 feet in diameter, and about the same in width. A sprocket wheel on the axle serves to work the well-known Chinese pump, familiar to all who have visited exhibitions or museums. It resembles our old man-of-war chain pump, but the pistons are square instead of round. When used at an angle these work in a three sided trough, passing over another sprocket wheel placed at its foot. For more perpendicular work the trough is closed, and thus becomes a four-sided pipe. The trough passes through a water-tight box in the wheel sluice, into which it empties its contents, and as it is always at work it effects the end in view well enough.

From 10 feet to 12 feet of "overburden" is the average that has to be removed before the karang or tin-bearing drift is reached, and water usually appears at about this depth. Assuming the vein to be satisfactory, and the pit kept well drained, the coolies load their ragas with the tin sand, gravel and soil of which the drift consists, and convey it up planks to the edge of the pit. The baskets are either carried singly or from a bamboo yoke in pairs, and the drift is then thrown into the head race. The sluice box is frequently made of a tree split lengthwise and hollowed out. Small dams are placed at intervals in the race to retain the rich dirt, which is again and again rewashed until only the biji or "tin seed" remains.

SMELTING.

To smelt the biji two forms of furnace are employed. One in use by the Malays is supplied with a blast from two upright cylinders. It is conical in shape and is built of clay. The Chinese smelting furnace differs from it slightly in shape, and being supported on three legs, is vulgarly known as the *Sam Kak Miao*, or "three-legged cat." It derives its blast from a square wooden box, in which slides a feather piston, usually worked by a boy squatted on the ground. It is not, however, invariably placed in this position. The melted metal pours from the furnace direct into the mold, not more than one slab or shoe of tin, as a rule, being cast at the same time. The slabs are piled in a hut until a sufficient number have accumulated to freight a good-sized boat, when they are dispatched to headquarters.

PROSPECTS FOR WESTERN INVESTORS.

Such is briefly the condition of native tin mining. Expenses have, of course, to be incurred in building attap huts for the coolies and staff, and in obtaining sufficient provisions. Riots often occur if the commissariat is not well looked after, as also on the six-monthly or annual settling days, should the coolies imagine they have been cheated of their just rights. In the main, however, the work is peacefully carried on, and many who began as day laborers have become rich men. Europeans have gone to this district, and have sent out quantities of costly machinery for the tin mining, dressing and smelting. They have, however, failed, chiefly because that which will pay on the very economical system of working adopted as described will not pay under European systems with a numerous and expensive staff and costly machinery. The pay to native laborers is exceedingly small, and it will only be by a very careful study of the whole of the conditions and circumstances on the spot that really profitable working will be possible to Europeans by Western methods, even now that transport will be improved.

Tin-Plate Production.

The daily press publish the following dispatch from Washington under date of September 28, but it is not made clear in the report whether the figures given apply only to American plates, for it will be noticed that the output of tin plates exceeds the production of black plates by 50 per cent. The dispatch is as follows:

Special Agent Ayer, from the sworn statement of manufacturers, has submitted a report to Secretary Carlisle, showing the production of black steel and iron plates and of tin and terne plates for the fiscal year ended June 30, 1893. The total of the former aggregated 63,581,541 pounds, and of the latter 99 819,202 pounds. The amount of American sheet iron and steel made into articles and wares, tinned or terned plates during the past fiscal year was 8,802,681 pounds. The quantity of tin and terne plate imported and entered for immediate consumption during the fiscal year aggregated 611,949,980 pounds. The quantity of the above plate on which duties were paid and which was used in the manufacture of articles exported with benefit of drawback was 128,863,227 pounds. The total consumption of tin and terne plate for the fiscal year was 720,000,000 pounds, of which 15 per cent. was of American manufacture.

Figures are given to show that "the product from American plates was about five-eighths of the amount necessary to enable manufacturers to meet the one-third requirement under the law, which provides that during any one year of the term of five years the domestic production of tin plate must equal one third the importations during any one of such years, otherwise the duty on tin plate will be abolished."

A Handy Man.

Many imitations have been given to the public of the famous advertisement of a "handy man," but the following is the original as published in a paper at Aylesham, Norfolk, in 1680: "By His Majesty's letters patent. Beards taken off and registered by Isaac Punchard Barber Perrewig maker Surgeon Parish Clerk Schoolmaster Blacksmith. I shaves for a penne cuts hare for twopence and oyld and powdired in the bargane, young Ladies genteely educated, lamps lighted by the year or quarter, young gentlemen also taut their grammar language in the neatest manner, and great keer takin of their morrels and spellin. Also salm singing or Horce shewing by the reel makir, likewise maks and Mends all sorts of butes and shews, teaches the Ho boy and Jews harp, cuts corns, bleades and blisteres on the lowest terms. Cowtillions and other danes taut at home and abrode, also deals holesale and retail in Perfumery in all its branches, sells all sorts of stationery ware, together with blackin ball, Red herrins, Gingerbread, Coles, Scrubbin brushes, treycle mousetraps, and all other sweetmeats, Likewise Godfathers cordial, red rutes, Tatoes, Sausages, Black Puddins and other Garden stuffs. P.S. I teaches Goggrify and all them outlanguaged kind of things. A bawl on Wensday and Friday. All performed God Willon by me Isaac Punchard. To be had at my warehouse were you may be served with the very best Bacco, by the ounce ream quire or Single Sheet. N.B. Also Likewise beware of Counterfeits for such is abrode."

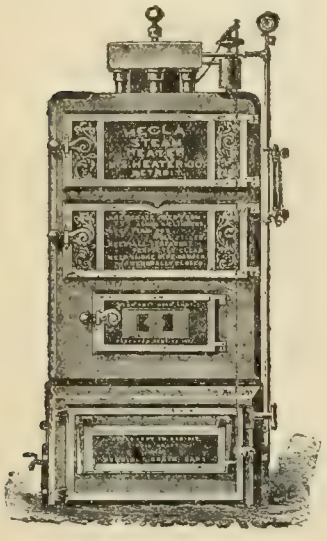
The much vexed question of the location of the new United States mint in Philadelphia is at last set at rest by the decision of Secretary Carlisle on a site at Broad and Cherry streets in that city.

The New York and New Jersey Bridge bill was favorably reported to the House of Representatives last week from the Committee on Commerce.

STEAM AND HOT WATER.

The Hecla Steam Heater.

The accompanying illustrations show a general view and also a view of one of the sections of the Hecla steam heater, which is being put on the market by the United States Heater Com-



The Hecla Steam Heater.—Fig. 1.—General View of Heater.

pany, Detroit, Mich., and to which reference was made in a recent issue of *The Metal Worker*. Referring to Fig. 2, which is an outline of the Hecla water section, it will be seen that the middle horizontal waterway is similar

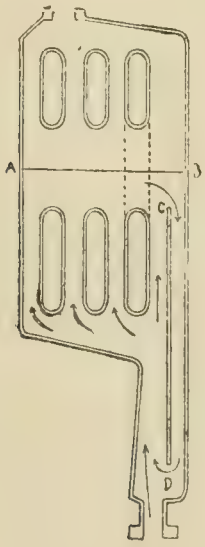


Fig. 2.—Outline View of Boiler Section.

to the one used in the Capitol heater, but increased in depth, thus giving increased steam and water space and making ample allowance for the fluctuation of the water line shown at A B. The upper part of the section becomes a steam chamber through which the hot gases circulate. Another important modification over the Capitol section is the enlargement of the water leg and of the outermost water tube, of which it is a continuation This further increases the water and steam space and permits the introduction of a diaphragm, C D, which provides for the circulation of the water in each section. A feature to which attention is directed by the manufacturers is the slightly funnel-shaped form given to the vertical water tubes. Their inclined walls, it is pointed out, permit every globule of steam as soon as it is formed to rise unimpeded, so that there is a continued and constant movement of steam upward from the heating surface to the steam chamber and a consequent steadiness of the water line. The Hecla is made with both single and double fire pot, the former in five sizes with grate surface from 22 x 21 to 22 x 37 inches and adapted to heat from 450 to 850 square feet of radiation. The double fire pot heaters, made in four sizes, are adapted to heat from 1100 to 1700 square feet of radiation.

Heat Controller Attachment.

The accompanying illustration shows a new device put on the market by Hodge Brothers, 15 Chardon street,

Heat Controller Attachment for Furnaces.

Boston, Mass, and which is to be used on Hodge's Eureka air valves, which were explained in a recent issue of the paper. This device is called their Heat Controller Attachment, and can be applied to any of their Eureka air valves in place of the cap. With this attachment any part of the radiator or coil can be heated at will, and the rest of the radiator kept cool, adapting it for use in mild weather when but little heat is required.

HEATING NOTES.

FERDINAND JAKEL, Detroit, Mich., is the patentee of an improved form of water heater. The heater is composed of rectangular cast sections, provided with a series of horizontal alternating tubes extending from the opposite vertical faces of the sections. The tubes are slightly conical and present an extended surface to the heat.

THE ROOF WORK on the new plant of the Buffalo Heating & Ventilating Company, at Homewood Park, Depew, N. Y., is almost completed. The company have begun drilling wells for a water supply, and will probably drill for gas wells in a few weeks. An effort will be made to obtain gas enough to run the plant and heat the homes of the workmen.

AMERICAN RADIATORS are to be used in Medina Temple, Chicago, and Orington Lunt Library Building, Northwestern University.

THE NASON MFG. COMPANY, 71 Beekman street, New York, are busy shipping their popular Equator for steam and Gulf Stream for hot-water boilers and their equipments.

AT RICHMOND, VA., the Smith-Courtney Company use the Gorton boilers made by the Gorton & Lidgerwood Company of New York in all their heating contracts.

Electric Motors for Small Power Requirements.

An increasing use of electric motors by tradesmen and others requiring small power is noticeable in the British metropolis during the past year or two. The *English Mechanic*, in relation to this circumstance, says: The advantages of the electric current for use in small motors are beginning to be appreciated in the St. Pancras district, where it is supplied during the daytime at a cheap rate. Power is useful to even small manufacturers, and many of them rent shops in which steam power is supplied at so much per week or month; but many do not want the power all the time the shafting is running, and those who could find the capital put in small gas engines, which they are loth to discard now, even though they can get the electric current for 3 pence a unit. New shops, however, will use it, as it is switched off and on with the least amount of trouble, and the payment is only for the current used. Brass workers, makers of "small goods" for the organ and piano trades, and other manufacturers who cannot put down expensive plant are beginning to find the electro-motors very useful and handy devices.

The most important move in iron and steel trade circles during the past week was the action taken by the Finishers' Association, at their meeting held in Youngstown, Saturday, September 23. It was decided to accept the 10 per cent. reduction in wages asked for by the manufacturers several weeks ago, but refused by the workmen at that time. It is now probable that a conference will soon be held and an agreement reached. The disposition of the finishers and the Amalgamated Association to adjust their differences will, no doubt, be a means to this end, but a settlement of the wages question is not considered certain, as the continued depression in prices has caused the manufacturers to demand a still further reduction than 10 per cent. If a settlement is made and operations commenced, fully 6000 men will be directly or indirectly concerned in the Mahoning Valley.

The Porter Adjuster for Electric Lights.

The Porter adjuster can be easily and quickly attached without detaching the cord from the lamp socket or rosette. Fig. 1 shows the adjuster attached in position on the cord with a part of the brass shell broken away showing the wood spindle with the cord slot through which it passes with the cord in position, one flange on the wood spindle being partly broken away to show a portion of the regulating spring. Fig. 2 shows

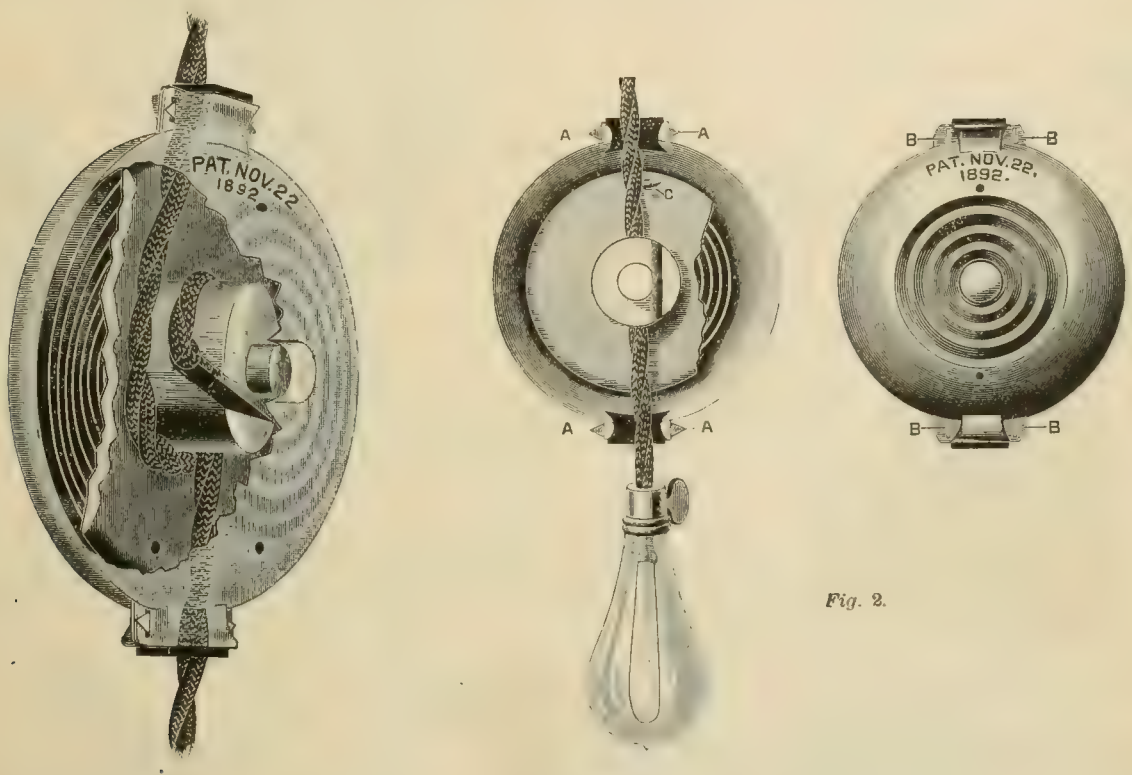


Fig. 1. Fig. 2.

THE PORTER ADJUSTER FOR ELECTRIC LIGHTS.

the adjuster with one-half of the brass shell removed, each of the shells being made of brass and stamped up to proper shape, one of the halves has four slots marked B and the other has four V-shaped points marked A, the wood spindle is secured to the latter so it cannot be displaced while being attached to the cord. To place the adjuster in position the cord is pressed to the back of the slot in the wood spindle; then the shell with B slots is placed so that the four points A extend through the slots. When these points are bent down they hold the halves together firmly. The pin C is then removed and the adjuster is ready for use. The spring is regulated to the desired tension before attaching. To move the adjuster up or down on the card after being attached it is simply necessary to pull the lamp way down and move the adjuster to the proper position, the card slipping through the slot in the spindle without injury. This device is made by Stephen Porter & Co. of 384 Atlantic avenue, Boston.

Great surprise is expressed in the naval service at the report that the boilers of the cruiser Chicago, now absent on the European station, are in so bad a condition as to require her immediate return for repairs. This vessel has been only seven years afloat, during which time her machinery has not been subjected to any hard usage, therefore it is thought that the defects must be due either to inherent weakness or careless use, either of which reason would demand strict investigation in the interest of the efficiency of the naval service.

Galvanized Sheets in Foreign Countries.

In view of the increasing demand for galvanized sheets abroad, the following table, given in the British Board of Trade returns for the month of August, and stating the amount and value of galvanized iron and steel sheets exported from Great Britain to various countries during the first eight months of this year, and in the eight months ending August 31, 1892, will be of interest as showing where this material is in the greatest demand. It will be noticed that while the volume of sheets exported has increased by 7500 tons, the value fell off £14,600.

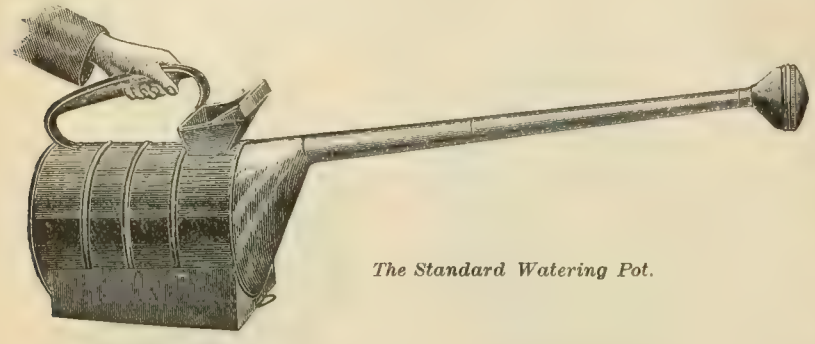
Galvanized Sheets.	Quantities.		Values.	
	1892.	1893.	1892.	1893.
Germany.....tons	936	1,185	£12,603	£14,542
Holland	726	609	9,334	7,332
Portugal, Azores and Madeira	478	507	5,785	5,795
Spain and Canaries	710	526	9,583	6,370
Dutch Possessions in India	1,913	2,488	24,187	28,643
Philippine Islands	1,466	1,551	21,371	19,517
Foreign West Indies	4,239	3,859	54,057	44,534
Mexico	1,762	1,948	24,664	24,011
Central America	1,927	2,448	26,919	31,286
Chili	7,718	5,453	92,281	60,909
Brazil	2,271	2,310	32,648	29,562
Uruguay	2,170	1,611	26 3 6	17,441
Argentine Republic	10,886	11,489	132,475	128,864
British Possessions in S. Africa	9,966	11,897	127,701	137,913
British East Indies	17,454	21,521	210,013	243,902
Australasia	25,564	25,018	393,659	344,688
British North America	2,230	2,669	36,513	42,195
British W. India Islands and Guiana	1,511	1,799	20,875	23,388
Other countries	8,356	12,035	110,488	145,955
Totals	102,383	110,905	£1,371,462	£1,356,847

As the result of comparative trials of the Baker and the Holland submarine boats the Board of Naval Experts has forwarded a report to the Navy Department setting forth its recommendations in favor of the Holland boat. The report recommends that the Holland company be instructed to have their proposed boat built at some responsible shipyard, and that they be awarded the contract at their price of $135,000. Of the $200.000 appropriated by Congress $150,000 was intended for the boat and $50,000 for experiment. The Holland boat, it is expected, will be able to descend to a depth of about 60 feet and make about 10 knots under water.

THE RETAIL STORE.

The Standard Watering Pot.

The accompanying illustration shows the Standard watering pot, manufactured by George H. Engelhart, Glenville, Ohio, which is especially intended for the use of farmers, gardeners, greenhouse and nursery men. This pot, for which a patent has been applied, is made with a square false bottom so that it will not tip over on being filled, and is provided with a long and substantial handle and a long detachable spout. The sprinkler on the end of the spout is arranged so as to throw water either upward or downward, as may be desired. It is pointed out that the handle being on top of the can balances it when filled or unfilled, and makes it easy to handle. The opening of the can is so arranged that the water will not splash over or out while carrying it, or when in use. The cans are made in five sizes, of 8, 10, 12, 14 and 16 quarts, and are made of IX tin, painted inside and outside.



The Standard Watering Pot.

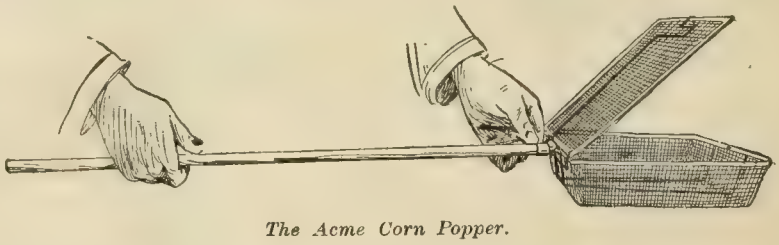
Engraved Acme Nut Cracker.

The novel feature of this article, as illustrated in the accompanying cut, is the engraving, a plain pattern of the cracker having been put upon the market some time since by the manufacturers, the Acme Shear Company, Bridgeport, Conn. The cracker is 6 inches over all and consists of an upper handle and jaw in one piece with a short jaw worked by the lower handle. A steel coil spring is inclosed at the top of the short jaw, which automatically opens this to receive a fresh nut as soon as the pressure on the handles is released. It is remarked that the construction is very simple and that the jaws are so constructed as to admit of cracking nuts of most kinds, from the largest to the smallest. Each cracker is placed in an anti-rust paper pocket, half a dozen being packed in a neat box. The cracker shown in the cut is full nickel plated. The goods are also furnished perfectly plain, highly polished and nickel plated, also plain black japanned.

Engraved Acme Nut Cracker.

The Acme Corn Popper.

Gilbert & Bennett Mfg. Company, 42-44 Cliff street, New York, with factory at Georgetown, Conn., are introducing the Acme corn popper, as shown herewith. The feature of the popper is the heavy wire lever by which the lid is controlled. When the lid is to be raised, as shown in the cut, all that is necessary is a slight pressure upon the lever near the handle. The wire is so bent at the front end of the popper that when the lid is closed it may be securely fastened to the basket by the hooked part of the lever simply by drawing the wire back. This allows the lid to be opened or to be closed and locked without danger of burning the hand, and prevents the lid from closing when emptying out the popped corn. The poppers are made in 1, 1½ and 2 quart sizes.



The Acme Corn Popper.

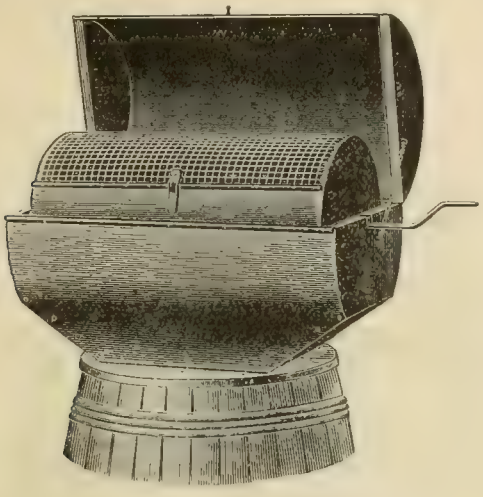
Rambler Alcohol Stove.

The accompanying illustrations show the Rambler alcohol stove, being introduced by Geo. L. Thompson Mfg. Company, 6126-6130 La Salle street, Chicago. It consists of a handsomely nickel-plated case, stamped from one piece of metal, 4 inches long and 1¾ inches in diameter. This has a beaded cover which fastens over lugs on the case, holding it securely in place. The case contains the stove, stand and bottle for alcohol; the stand opening to a diameter of 2½ inches. A spoonful of alcohol fills the stove, which, it is stated, will burn for ten minutes with steady, intense heat, which is ample for the purposes intended. The point is made that the bottle of alcohol is always at hand when needed, and cannot be spilled while in the case. The case may be carried in the pocket or satchel when traveling, the stove being designed for heating curling irons or liquids.

Rambler Alcohol Stove.

Dustless Barrel Ash Sifter.

Held & Gruenhagen, St. Anthony Park, Minn., are introducing the dustless barrel ash sifter, herewith shown. The material of which the sifter is made is principally cast and sheet iron.

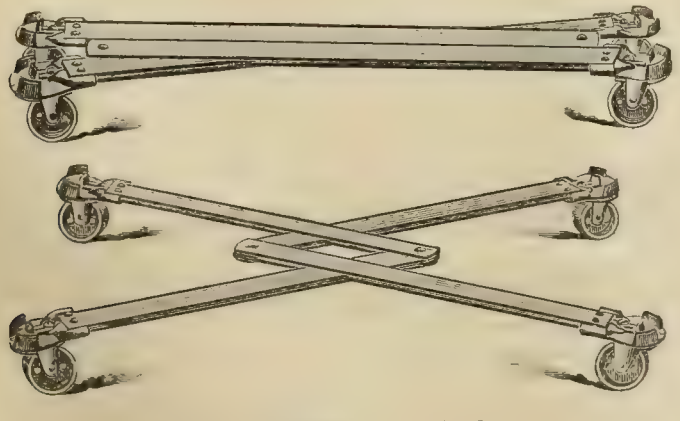


Dustless Barrel Ash Sifter.

The inside roll is made of galvanized iron netting, with ¼-inch mesh. The manufacturers claim that the sifter is practically dust proof, and may be used in a basement or back shed without making any dust or dirt; also that the revolving principle makes the sifter easy for any person, even a little child, to operate. The sifter is made in two sizes: No. 1, with inside roll 12 inches long by 12 inches in diameter; No. 2, inside roll 24 inches long by 12 inches in diameter. The bottom casting of both sizes will fit any common-sized barrel.

Steel Lock-Frame Stove Truck.

Some time since we called attention in these columns to an improved stove truck which was being manufactured by Randall & Ward of Le Roy, N. Y., and for which many claims were made. The makers have now brought out another truck, in which the four arms are wholly of steel, instead of wood and metal, as employed in the old device. The steel lock-frame stove truck, as it is called, and which is shown in the accompanying illustration, carries the stove 2½ inches from the floor, while easily handle any stove. The caster employed is a special one made for the truck and having a particularly deep foot plate. The four double arms are so crossed and bolted together that they become self supporting, and in order to adjust the truck to any stove it is only necessary to pull them apart or push them together, according to the requirements of the case. The steel is nicely japanned, and riveted to the manufacturers' special anti-friction caster with coppered foot plate. The stove truck is fully warranted, and will be offered to the trade as the "cheapest steel truck on the market." The engraving here presented shows the truck extended ready for use, and also indicates its appearance when closed for storing or shipment.



Steel Lock-Frame Stove Truck.

holding it secure without the use of clamps, yokes, bolts or other unnecessary contrivances. The makers state the arrangement is such that one man can

Hammer Handle Tack Package.

The Grand Crossing Tack Company, Grand Crossing, Chicago, Ill., are offering the above article as illustrated herewith. The cut represents the package one quarter its size, the handle being filled with steel carpet tacks. These are packed half a gross in a sandpapered box with hinged cover, in assortments of 6, 8, 10 and 12 ounce tacks. The manufacturers remark that the consumer pays 5 cents for a nickel's worth of tacks and gets a hammer for nothing.

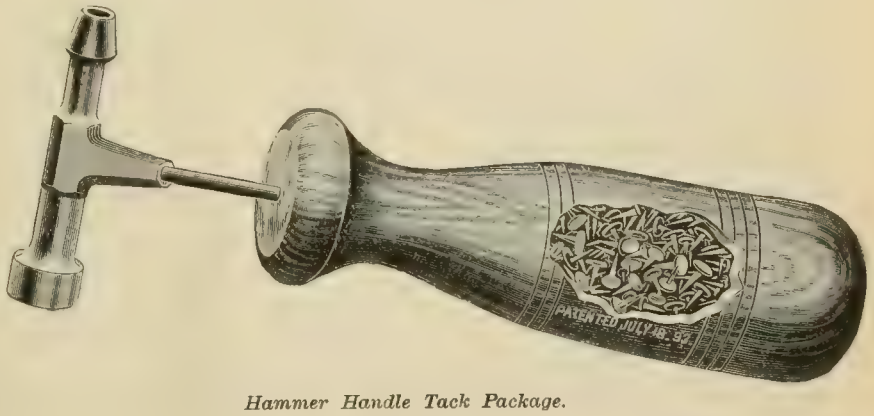
MEMORANDA.

HALL BROTHERS of Ballston Spa, N. Y, were awarded first premium for their exhibit of stoves and hardware at the Saratoga County Fair.

NEWTON & HILL AND C. W. BOUTELLE of Fort Edward, N. Y., made splendid stove exhibits at the Washington County Fair, recently held at Sandy Hill, N. Y.

THE HARDWARE, STOVE AND TINWARE STOCK of Rensch & Coffey, Madison, S. Dak., has been purchased by McDonald Brothers. The retiring firm had a fine business at the time the sale was made, and McDonald Brothers have good prospects of success in their new venture.

A German mechanic has, it is announced, discovered a process for producing, through the combination of rawhide and a composition of his own, a new material adapted to the manufacture of cog and friction wheels, which is likely to supersede iron and other metals in certain cases. It is claimed that this new material not only insures the noiseless working of machinery, but also that teeth made from it are more durable than those of metal.



Hammer Handle Tack Package.

The *American Druggist* reminds us that we are indebted to the ancient Romans for the great canning industry. Years ago, when the excavations in Pompeii were just beginning, a party of Cincinnatians found in what had been the pantry of the house many jars of preserved figs. One was opened, and they were found to be fresh and good. Investigation showed that the figs had been put into jars in a heated state, an aperture left for the steam to escape, and then sealed with wax. The hint was taken, and the next year fruit canning was introduced into the United States, the process being identical with that in vogue at Pompeii 20 centuries ago.

HEATING AND PLUMBING.

NEW WORK AND CONTRACTS.

A. C. JONES, Paris, Maine, has completed the erection of a steam heating plant in the new residence of L. S. Billings.

THE FRANKLIN COUNTY, PA., ALMS HOUSE is to have a new steam heating plant, the Commissioners having awarded the contract to the Harrisburg Steam Heat & Power Company, Harrisburg, Pa., at a reported price of $5800.

A COMMITTEE OF SIX from the School Commissioners of Syracuse have been visiting the schools of Boston, Lowell and Worcester, Mass., to gather information of heating systems to guide them in selecting the proper one for the new Townsend School. The selection will be made at an early date.

THE VANDERMAN PLUMBING & HEATING COMPANY, Willimantic, Conn., have received the large horizontal tubular steam boiler to be used in heating the new Murray Block, and are now engaged in the work of setting it.

HENRY W. COVELLE has secured the contract for plumbing the new apartment house built by J. D. Whiting, at Somerville, Mass.

BROWN & MORROW, Brockton, Mass., have recently installed a hot water heating plant in the Convent of the Sisters of Charity and have the contract for plumbing the new Whipple-Freeman Block. They have just completed plumbing a new boarding house connected with the Howard Seminary, and are now overhauling the plumbing in the seminary building.

COE & MCMILLAN, Monticello, Ill., have secured the contract for placing the plumbing in the Piatt County Court House, at Monticello, consisting of five water closets and four urinal stalls of slate, at a cost of $1400. They have also just closed the contract for putting in a Perfect hot-water heater for Harry Knight of Monticello, using the Detroit ornamental radiators, the price being $325. In addition to the work on hand they are making estimates on several jobs outside the city for plumbing and heating.

SAMUEL I. POPE & Co., 360 and 364 Dearborn street, Chicago, have the contracts for steam heating in the following school buildings in Chicago: Longfellow, Burr, Langland, Arnold, West Pullman, Cornelia street and Hyde Park High School. Also Empire Theater, West Madison and Union streets; Medina Temple, Jackson street and Fifth avenue; South Chicago Police Station; Ovington Lunt Library and Dental College, Northwestern University.

THE BAKER & SMITH COMPANY, 193 to 197 Van Buren street, Chicago, are to supply a Unique hot-water boiler and Champion radiators for heating the residence of Warren Leland, Forty seventh street and Grand boulevard. A locomotive boiler and 175 Champion radiators for steam heating in Hotel Glenarm, Indiana avenue and Twenty-second street.

BENJAMIN F. SHAW, plumber and steam-fitter, at 315 Orange street, Wilmington, Del., gives steady employment to 30 experienced workmen. He has a number of men at work on a contract of several thousand dollars for the Scranton Traction Company, at Scranton, Pa. He has just completed the work on a nursery for Sparks & Hannum, South Wilmington, Del. A combination steam and hot-water system, with a 200 horse power boiler, is used, with more than a mile of piping. Hot water will be used until the weather becomes cold enough to require the use of steam. On completing this job it was tested, when everything was found to be working in a first-class manner. The nursery consists of eight houses, each 260 feet long and 20 feet wide. A feature of the plant is the use of the purlins that support the roof for watering the plants.

THE L. H. PRENTICE COMPANY, 205 and 207 Van Buren street, Chicago, are to furnish two tubular boilers, 60 inches by 14 feet, radiators, tanks, pumps, &c, for the school building at Sheffield avenue and Grace street.

A. KNOWLES, New Bedford, Mass., has received the contract for heating the Church of St. Hyacinthe with two Richmond steam heaters.

THE BLOCK in which is located the store of Hale & Burgess, at St. Albans, Vt., is being equipped with a combination hot-air and hot-water heater, the hot air for the lower floor and hot water for upstairs.

THE new St. Joseph's Orphan Asylum of Green Bay, Wis., will consist of a main building 54 x 170 feet and a wing 36 x 90 feet. The entire building will be heated by a hot-water system, and provided with modern ventilation.

THE BOARD OF REGENTS of the Agricultural College and Experimental Station at Oklahoma will receive bids up to October 16 for the steam heating and ventilating of the college at Stillwater, Oklahoma.

BIDS will be received up to October 9 for the necessary heating apparatus for an additional wing and assembly room to the Kansas State Normal School, at Emporia, Kan.

BIDS will be received up to October 9 for the construction of a general steam plant for heating and power at the Kansas State Agricultural College, Manhattan, Kan.

A NEW COURT HOUSE is to be built at Carthage, Ill., for Jasper County, and will be heated by steam.

BIDS will be received up to October 16 for the plumbing, tinning and heating work for two cottages for girls and a school and industrial building for girls at Whittier, Cal.

A 35 HORSE-POWER BOILER, steam pipe radiators and other fittings for steam heating will be required for the National Home for Disabled Volunteer Soldiers at Los Angeles, Cal.

THE CONTRACT for furnishing material and doing the plumbing, gas fitting, heating, tinning, galvanized iron and slating work for the State Normal School at Los Angeles, Cal., is about to be awarded.

W. L. PORTER & Co. of Minneapolis, Minn., have been awarded the contract for putting in the steam heating fixtures in the court house at Crookston, Minn. A. C. Perman will superintend the work, the cost of the job being $1040. The jail will be heated by steam from this same plant.

A STEAM or hot-water heating plant, not yet decided, will be used for heating the court house at Bowling Green, Ohio.

THE COUNTY COMMISSIONERS of Waverly, Minn., are about to have a heating plant placed in the court house.

ALEXANDER DON, the plumber, of Newark, does not confine himself to plumbing alone, and is now engaged in setting a Furman hot-water boiler in a residence at Long Branch, N. J., and has a contract for an $1800 heating job in Brooklyn, N. Y.

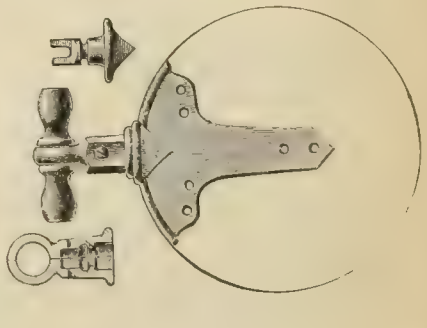
THE NEWARK HEATING & MFG. COMPANY, 36 Mechanic street, Newark, N. J., have just completed installing a Furman hot-water boiler in the residence of Hugo Geisslee, and recently installed a Silsby steam boiler in the Hook and Ladder House No. 1, Paterson, N. J, for heating the building and keeping the fire engine ready for immediate use.

WALTER P. DUNN, 98 Market street, Newark, N. J., has just completed the work of putting a Perfect hot-water boiler made by the American Boiler Company in his own residence. The Bundy Elite and Bundy Renaissance radiators were used. A large contract which has just been completed by him was at the St. Joseph's School. A large horizontal tubular steam boiler, made by L. J. Lyons & Co. of Newark, N J., was used for this job. The plumbing included J. L. Mott's system of automatic flushing water closets with overhead tanks and the roof was covered with Merchant & Co.'s Camaret tin.

The B. B. Damper Clip.

Berger Bros. of 237 Arch street, Philadelphia, are putting on the market the patented damper clip shown in the accompanying illustration.

It consists of an iron casing or sleeve made in two sections, one end gripping



The B. B. Damper Clip.

an ordinary damper shaft and the other end clamping a wooden handle, the whole held tightly together by a bolt. The handle is held or locked at a point close to the pipe sufficient to allow of a free turning of the damper. The method of locking or fastening the handle makes loosening impossible and obviates the grinding or wear on the pipe so common to ordinary clips. When inserting the disk in the pipe the handle need not be taken apart, as a few turns of the nut on the bolt unlocks it and it slips off whole.

White Caps in Eastern Mississippi and Western Alabama have posted notices on the doors of every cotton-ginning house in these districts that if a bale of cotton is ginned before the price shall have reached 10 cents the property of the ginners will be destroyed by fire.

STOVE TRADE NOTES.

The Future of the Hot-Air Furnace.

By A. W. Glessner,

President of the Excelsior Steel Furnace Company.

THE HABITAT OF THE FURNACE.

The field for furnace work is a growing one. Originally confined to the Atlantic States, the hot-air furnace has followed the line of progress westward until no State or Territory has been able to resist its onward march ; within a few years even the South has grown to appreciate the luxury of hot-air heat, and the leading dealer in Memphis writes that he expects to put in between 50 and 100 furnaces this season. In the far Northwest it was but a short time ago when the first furnaces were sold, and now one salesman reports a total of 16 carloads for that section as a result of his spring trip. The first goods sent to that section were not suited to the requirements of the bituminous coal burned out there, and one carload sent to Portland in the early days had to be practically rebuilt.

Canada is calling for furnaces, and a recent number of *The Metal Worker* referred to a shipment to Ireland by a New York manufacturer. Germany has taken much interest of late in hot-air heating, and travelers from that country in attendance upon the World's Fair have given much attention to the furnaces on exhibition there as well as to other lines handled in Chicago, and some business will result.

FURNACES IN THE WEST.

It is interesting to notice the growth of furnace manufacture in the West, showing in a measure the demand in that section for hot-air furnaces. There was a time when Maine was the source of supply for the furnace trade, but at the present time an important group of manufacturers are springing up through out the middle West, although Eastern New York and New England control the lion's share of the business, and must continue so to do for some time to come.

A very large portion of the output is marketed in the territory west of Buffalo and Pittsburgh, and the development of the West during the coming 20 years will lead to a tremendous demand for furnaces. Chicago is and will be the largest user and jobber of furnaces and heating goods and will play an important part in the development of manufacturing these goods, for within her boundaries are produced the iron, steel, bolts, screws, and even the cement necessary for making the goods, and these advantages must eventually be recognized and appreciated.

The present financial stringency will have a bad effect on the silver States and for a time at least they will be poor customers for furnaces, but with the return to normal conditions they will become buyers of furnaces again, and a large trade will be built up in that section.

(To be continued.)

Computing Furnace Capacity.

The following interesting letter is from a correspondent well versed in furnace matters, whose attention was called to an inquiry for a rule for finding the capacity of furnaces. The suggestion was made that as the steam and hot-water trade could satisfactorily calculate the capacity of apparatus without an actual test, the furnace trade might be benefited if simple methods were published for calculating the capacity of furnaces:

Referring to article on page 49 of *The Metal Worker* of September 16 inquiring for a rule for finding the capacity of furnaces, I would say that possibly each manufacturer of a furnace has in his possession the necessary data for estimating the capacity of his own particular furnaces, but to get at a general rule that would apply to the majority of furnaces would be almost impossible, for the reason that each furnace works under different conditions, and it would be necessary to have some basis on which to figure. As, for instance, a given furnace with a certain diameter of fire pot and a certain number of square feet of radiating surface should be taken as a basis from which to estimate, and said furnace with said size fire pot and said number of feet of radiating surface should raise temperature of so many thousand cubic feet of air from a given temperature within a building to another degree of temperature with the temperature of the atmosphere without at a certain degree.

This would lead to so many complications that I doubt very much if any one could arrive at a rule that would be approximately correct. Now, if you will examine the construction of certain leading furnaces in the market, you will notice that they vary greatly, not only in the fire-pot diameter and cubical contents, but also in the amount of radiation above the fire pot, which would make it very difficult to properly estimate the capacities unless we should arbitrarily fix some such rule as this: The number of square feet of surface on fire pot should be considered in the calculation of the capacity of a furnace as being three times as valuable as the radiating surface of the smoke radiators above the fire pot; also the dome, whether cast or wrought, might be considered as having an efficiency per square foot of radiating surface of twice that of the smoke radiators. In order to get at the relative capacity of, say, the fire pot, dome and radiators, a thermometer might be placed at the different points indicated and in close proximity to the radiators, dome and fire pot, and the different degrees of temperature at these points noted.

Again, no furnace can be considered in its capacity without considering the position in which it is placed and also the chimney to which said furnace is to be connected. In figuring steam for mechanical purposes it is easy to compute the number of horse-power indicated, but we all know that the indicated horse-power is usually in excess of the actual horse-power developed by from 25 per cent. to 33⅓ per cent. Now, should we assume that a given furnace with a given fire pot and a certain number of square feet of radiating surface would raise a certain amount of air to a required temperature with the mercury at a certain temperature on the outside, we might consider the capacity of this furnace's normal condition to be the volume of the capacity which we have taken for the basis, but the conditions under which this furnace would work in different houses would be so very different that we would still have to give to this furnace a varying capacity such as is given by us and other furnace makers in figuring the capacity of a furnace.

Every one has probably observed in their experience in hot-air work that a furnace will heat a larger volume of air in an audience room where there are no dividing partitions than where the building is cut up into different rooms, and just why this should be I do not know.

ODD PLATES.

Superintendent Cowdery of the Milwaukee (Wis.) Gas Light Company states that 7000 gas stoves have been placed in that city, and are in use at the present time. Of this number 2600 were placed since January 1, 1893, showing that the use of gas for cooking is on the increase.

F. Farquhar & Sons, Blue Island, Ill., publish a circular illustrating and describing the Farquhar seamless furnace. The publication is neatly devised, small cuts showing general and sectional views of the Farquhar furnace.

At the Erie County, N. Y., fair, S. S. Jewett & Co., Buffalo, occupied a separate building for the exhibition of their well-known ranges. One of the features was the Brilliant oil stove. Fish & Kromburg were in charge, assisted by S. M. Hall.

The latest advertising vagary of the Globeille Pattern Company, Cleveland, Ohio, is a blue print 8 x 4½ inches in size, one-third of which is given to the company's sapiential trade-mark and an announcement concerning their facilities for making furnace and heater patterns. They also mention that their segment work is done by machinery. By way of emphasizing this last statement the remainder of the blue print shows a wooden dome apparently 6 feet or so in diameter, mounted on some special turning machine, with a workman in position at the tool rest with chisel in hand.

An English firm, Morwood, Sons & Co., Harleston Iron Works, Sheffield, are reported to have in hand some notable examples of cooking ranges for European and other navies. They have just completed, says the *British Trade Journal*, several unusually large ranges

for the Spanish Government. These appliances are all self-contained and made of steel and iron, carefully fitted together and tested before leaving the works. They are not dependent on a bricksetter making the flues right, everything of this sort being finished complete before leaving the premises. They consist of a series of roasting and bread-baking ovens, cooking and water boilers. Those used on board the large troop ships are of immense size, one apparatus being capable of cooking for 1200 men.

THE MANY FRIENDS of Thomas A. Douglass, the heating engineer with the Richmond Stove Company, Norwich, Conn., will be pleased to learn that he is now convalescent after a severe illness of two months, and sincere hopes are entertained that he will soon be able to be out among the trade.

PREPARATIONS are being made by nines composed of the molders and polishers of Rathbone, Sard & Co.'s Albany plant for a match game of baseball which will take place soon. It is understood also that a contest between the molders of Rathbone, Sard & Co. and those of the Littlefield Stove Company will come off in the near future.

JOHN KAMMERER of Gowanda, N. Y., made a fine exhibit of the Cortland-Howe system of ventilation at the Erie County, N. Y., Fair.

UNDER THE HEAD of "Heating the House and Cooking the Dinner," the Boston *Commercial Bulletin* reviews the trades interested. It says: "Usually in this month considerable business is done, but though money is less stringent, the fact that a little delay in making purchases in this line is less injurious than in some others has delayed the trade in a measure, and orders are somewhat restricted. Numerous small orders, however, have been placed with a frequency that shows an aggregate which has reduced the stocks very materially. Improvements are noted in hot-air furnaces, and the growing popularity of hot-water and steam boilers for house heating, and the introduction of what is called 'new combination' in the use of a water heater in a hot-air furnace. In kitchen goods improvements continually appear, through strife of the manufacturers to make more convenient as well as handsomer stoves, and the product of this year shows an advance in both respects."

THE ELECTRIC OIL & GAS STOVE COMPANY, 295 Pearl street, New York, are putting on the market a new square asbestos-reflector gas heating stove, which is known as the New Chief.

WE ARE IN RECEIPT from the Chicago office of the Peninsular Stove Company of a sample of the nickel plated shoe horn which the company are distributing among the visitors to their display at the World's Fair. The horn is of the usual form, finished with a high polish, and the back bears the inscription in sunken letters: "Compliments of Peninsular Stove Co., Detroit, Chicago, Buffalo."

LUTHER & LEDERHOS, 30 Cliff street, New York, are just sending out their catalogue of gas stoves for the fall and winter of 1893. It has a brown cover and contains 24 pages. The Brilliant Star, they say, is the handsomest gas heating stove on the market. It is of the round, open reflector style, and is provided with a door for lighting, as is also the Home Comfort, a square reflector stove. The enterprise is a new square heater that is made as a reflector, with an asbestos fire and with an asbestos pyramid gas log. The Eclipse is another new round open reflector, with a pyramid asbestos fire. The Model Radiator is new and attractive, one of its useful features being a water pan in the base. The Enterprise oil heater is entirely new, very pretty, and has a 15-inch circular flame. The base is ornamentally japanned and casters are attached to the legs. The Hercules oil heater has been improved and a heating drum added. Gas supplies of various kinds occupy the balance of the catalogue, which should interest the gas-stove trade.

THE CHICAGO & ERIE STOVE COMPANY of Erie, Pa., have added to their assortment of heating stoves a very attractive construction known as the Sapphire. The entire back of the stove forms a portion of the burner, there being nearly 400 small openings through which the gas flows. The back is composed of asbestos fiber and when the gas is ignited the appearance is that of an "incandescent sheet, shimmering with light." The front, top and bottom of the stove are cast iron, while the sides and back are of embossed Russia iron. The stove is adapted for burning natural and artificial gas, and the company state that where it is intended to use manufactured gas it should be so indicated in the order, as the mixer for this gas is different from that for natural gas. Attention is also invited by the company to another heater, which is made of cast iron and offered at a moderate price. The cold air enters between the back of the stove and a deflecting plate, passes upward, becoming highly heated in its passage, and is discharged through openings in the upper portion of the front. A detachable blower with mica illumination is provided, which prevents the escape of gas into the room in case of the accidental stoppage and reopening of the flow of gas occasionally occurring through the breakage of gas mains.

SOME DAYS AGO the works of the Richmond Stove Company of Richmond, Va., were visited by a slight fire, which was discovered in the carpenter shop. According to a local paper, the blaze was caused by a spark from the smoke stack of the foundry igniting the sash of one of the windows. The flames were extinguished before the arrival of the fire department and the damage was trfling.

BUCK'S STOVE & RANGE COMPANY of St. Louis, Mo., have been distributing to the trade circular letters calling attention to matters in which dealers are likely to be interested. Among other things the statement is made that the company's foundry was run to the limit of its capacity from January 9 to July 29 of the present year, closing down at the latter date owing to the depression in general trade. Early in September, however, the company were encouraged to resume operations in all departments, and thus convey the impression that from their daily experience it was an error to have closed their works at all. Orders are reported heavy and to be increasing rapidly. The company urge upon their friends and customers to give prompt attention to stocks of stoves on hand and to enter orders without further delay, as it is "now evident that the demand for goods during the next three months will be overwhelming." One of the circular letters calls special attention to Buck's stoves and ranges, and also to the line of heaters made under the name of Buck's Oak. The latter is shown in several styles of ornamentation, and descriptive particulars enable the dealer to comprehend the salient features of construction.

THE MICHIGAN STOVE COMPANY of Detroit, Chicago, Buffalo and New York City have issued a stock sheet of special bargains in hard-coal heating stoves, soft-coal heaters, wood heaters, hard-coal ranges, soft-coal ranges, wood ranges, hard-coal cooking stoves, soft-coal cooks and wood cooks, comprising styles of 1892 and immediately preceding years. Net prices are given in the stock sheet, and the statement is made that the goods are strictly first class and salable in every particular. They are all subject to previous sale. A very neat circular is issued by the same company illustrating their Art Garland reflector-top base burner, which is made in three sizes plain and in two sizes with oven. A number of new features have been introduced for the present season. A sample has been sent us of the new telescopic pocket match box, which will be distributed through Garland agencies.

SAM S. UTTER, 113 Beekman street, reports that during the summer he has been busy in shipping goods to various points throughout the country. Mr. Carey, his Boston agent, has added an extension to his already capacious store to make room for a bigger show of oil and gas stoves, as well as a full line of Sam ranges. The Sam range has now attained its fifteenth year on the market and still continues popular among the dealers. It is made in 26 sizes and kinds, having all the modern improvements, including large oven. Sam is ably assisted in the management of his business by his son, John Utter, who has been brought up to the stove trade since he was a boy.

A DISPATCH from the St Louis representative of *The Metal Worker* reports that the demand for stoves, coal hods, stove trimmings, &c., is very heavy in that section, mainly on account of the cold weather at present prevailing throughout the entire West.

CHAS. O. LYON, president of the Thatcher Furnace Company, 33 Peck slip, New York, returned to New York on Tuesday, after an absence of four weeks. During that time he visited the principal cities in the West, calling on their agents, who reported increased sales for the Thatcher furnace and ranges during the year. Their agents in Des Moines, Iowa, St. John & Barquist, report that their sales have doubled as compared with the sales a year ago. Several agencies have been established at other points where there were none already. Edward Benedict, treasurer, who has full charge and supervision of their foundry in Newark, is working with a full force of 75 men. Many improvements have been added during a short summer recess, making their establishment a complete one in every respect.

THE BRAND STOVE COMPANY of Milwaukee, Wis., have recently resumed operations with a large force and report the receipt of orders from all parts of the country. Members of the concern express the opinion that the prospects for the fall are encouraging, and that a good volume of business will result.

THE HOUSEHOLD STEEL PLATE RANGE is the subject of a very pretty pamphlet which reaches us from the Columbus Steel Range Company, 188, 190 and 194 West Broad street, Columbus, Ohio. The range named is care-

fully described, attention being called to the features incorporated, while directions for using the Household are likely to interest wide-awake dealers who desire to thoroughly understand every selling point in connection with the goods they handle. The engravings employed to illustrate the Household are photo-reproductions and give an excellent idea of the features of ornamentation. The Household is made in a number of styles and sizes adapted to meet varying requirements. In its construction the manufacturers claim they use nothing but Nos. 14 and 16 gauge cold-rolled steel, the parts being closely riveted, every joint cemented and the ovens securely braced with heavy bar iron, thus preventing warping or springing apart. Among the features incorporated in the Household may be mentioned oval fire chamber, ventilated fire back, shaking and slicing grate with draw center, asbestos-lined flues, cut long centers with supports, oven ventilator, large cast water back tested to 110 pounds steam pressure, capacious ash pan, malleable iron oven-door frame and hinges, attractive front corner posts or columns and japanned body.

GEORGE M. CLARK & Co. of Chicago, Ill., issue a very neat catalogue of 40 pages, bearing the suggestive title of "Jewel Gas Heating Stoves." These goods are well known to the trade and have established for themselves a wide reputation. The Jewel perforated heaters are of such a character as to present a very brilliant appearance when in operation as well as being powerful in the amount of heat radiated. Concerning these heaters the catalogue says: "By the combination of the perforated body and base, construction of burner and position of deflector, the largest possible amount of heated air is distributed through the perforations near the base of the stove. The cold-air current which is constantly passing between the floor and the base of the stove feeds the burner and cylinder with fresh air to be heated and at the same time protects the floor from the heat. The burner is made in such a form and the cold air is admitted in a manner to produce the best combustion; hence there is no odor." The perforated goods shown in the catalogue are known as the Jewel Colonial, the Jewel Pioneer and the Jewel Sparkle. The little volume is neatly printed on good paper, bound in colored paper covers and presents a great deal of information of interest and value to dealers handling stoves intended for burning gas.

THE SUPERIOR STOVE COMPANY of South Superior, Wis., resumed operations a few days ago with a force, we are informed, of about 50 hands which it is expected will be kept busy all through the winter. General Manager John D. Green is reported to have expressed to the representative of a local paper the following views with regard to the outlook in the stove trade: "The stove business this year will not be what it has been at other and better times. People who in easy times would heat a ten-room house will this year close up half the rooms and heat but five. Everybody will live close and economize. Still, business will constantly enlarge as time goes forward."

THE WOLFF GAS RADIATOR MFG. COMPANY of 164Franklin street, New York, by means of tastefully printed circulars call especial attention to their new styles and patterns of gas radiator, with open-work base and nickel trimmings, with or without flue connections. The flue-connection radiators are made especially for natural gas, principally for Northern Ohio and Indiana, where the gas is more or less charged with sulphur. The superior quality of natural gas in Western Pennsylvania permits of good results without flue connections. The company have also issued a large poster, lithographed in bright and varied colors, showing the Wolff radiator very much as it would appear in operation.

A. R. CANFIELD, New York, manager of the Danville Stove & Mfg Company of Danville, Pa., has just got his showrooms arranged with a display of their latest goods. On entering, a Beaver Franklin, resting on a mosaic tile mat, greets the eye. Then comes, mingled with the old standard goods, the Princess Beaver, a new square parlor made half and full revertible flue and as a double heater. Next the Queen Beaver, a new square range that is said to do handsomly as well as be handsome. A new high shelf that quite holds its own with the range is one of its appurtenances and another of this year's productions.

Traveling Salesmen.

BY JEEMS.

When you go to the old fashioned circus you always hear the ringmaster order, "Now then, Mr. Merryman, see what the young lady wants," as she brings her steed to a halt after her first excursion around the ring. The "young lady wants the banners," replies the clown with a great flourish of speech, and the banners are brought forth. So it is with stove conventions, the traveling salesman is a feature in the ring, and he is made to hop over the banners and vault through all the balloons just as if he was the fellow who invented all the perplexing vexations which settle deep in the brain of the weary employer and make him long for their total abolition from the face of the earth.

It is quite interesting to read the essays regarding the gentlemen who are professionally known as "traveling salesmen," as to what they should be and do to gain and merit this title; in short, what a bang up first-class hustler ought to be. It all reads well, and no doubt it is the proper caper to possess such qualifications, and those who have them should be looked up to and copied by the younger gentlemen who are in the profession, or who intend to take it up. They cannot, I am sure, do better than acquire the qualifications so charmingly described. It might be said that a very good sort of a traveling salesman is a chap who could sell the most goods at the biggest profits, and not make a bad debt. This qualification could be a set off against those nice niceties which the ideal ought to have. To be sure he might have all the others, but as between the two it is probable that the latter would be a sort of a recommendation, even if the cut of his jib or the style of his cady were not of the latest pattern.

Before the terrible era of high art took possession of the stove trade the boss used to have drummers come around the shop, but there wasn't so many then and they did not come so often; in fact, our shop was a sort of headquarters for the boys. The old man wasn't so dyspeptic them days, and was as full of fun as any of them; but it is different now. The old man don't keep up with the times. He does, however, run a bang-up tin shop, but no new fangled things are tolerated in it. Old Tim, our foreman, runs the shebang, and he has got a lot of old customers who won't buy only of the boss, because they "kin always reckon on his wares." So we are not favored much with visits from the profession. The old man used to have one of them flat-backed, bleareyed, fat black-and-tan female terriers. She got to be a very knowing creature, and was quite curious at times about strangers. She used to lay in the store where she could see the door open, and the chances were if a traveling man came in she would waddle out to look him over, at least it seemed so, and if she liked him she would wag her tail —that is, she couldn't give it a full wag because of an accident, but it was still a dog's greeting. She couldn't cock her head up full dog-fashion, neither, but she would show her pleasure through her bulgy eyes, and if she liked the fellow it was a pretty sure thing he did business with the boss. If she didn't fancy a man she would trot up to him, look him over for a moment, and walk slowly back in the shop and settle down with a tired look and a big sigh that was truly affecting. The dog was generally right, for the fellow was usually a duffer. It shows that even dogs have an intuitive instinct regarding these gentlemen. The old man does not sour on traveling men exactly, but he doesn't feel so much interest in them as in old times. His son Jack looks after the store, and does most of the talking. But Jack is as fresh as they make them, and when he is in the humor he likes to put his knowledge on parade, and the consequence is the shrewd ones are "on to his curves," and generally knock him out. Jack's weakness is baseball; he eats, drinks and sleeps baseball, and if any traveling man has the same weakness he can be Jack's friend. There is one fellow who hates baseball with a vengeance, but he has managed to get an order out of Jack several times. He has been letting Jack post him on the game, says "Jack is an oracle, and the most perfectly posted man he ever met on the subject." But if you were to ask him four minutes afterward about the game he wouldn't know what you were talking about. He never pays attention to Jack's talk, but waits his opportunity to get a home run, and he gets there.

Of course all buyers are not like Jack nor all dogs like the boss's, and it is an open question what are the qualifications for traveling men. All men do not do business on the same lines, the most careless and improvident succeed sometimes when the alert expert does not. It could not be tolerated that the careless plan is the correct one, but all these things are quite perplexing, and so it is with the traveling man. It is a pretty difficult thing to find the ideal, especially for the stove trade; not but what it should have the best, but there are too many more like the boss who are set in their notions and "what they used to do" is the only rule and guide they know, and all else is bosh. But the world moves, and the chances are much against those who are going to keep up in the race on "what they used to do," and no doubt a much better grade, or if not a better one perhaps different methods, will be pursued both by the makers and venders of the greatest stoves on earth, as well as the inciters of public interest in them, who are so much of a stumbling block at present to their employers.

Gas Lighting, Heating and Cooking.

A FEATURE of the English gas stoves exhibited by the dealers in New York is the universal provision made for a chimney connection, and a feature of the American stove is the almost universal absence of such provision. The combustion of anything that goes on continually in a closed room will vitiate so large a portion of the air that the advantage of a chimney is apparent.

THE SHOW WINDOW of Excelsior Hardware Company, 58 Warren street, New York, makes a fine display of gas radiators and English wall fires. The newest English wall fire or open grate is handsomely ornamented with tile, and the fire chamber is filled with material that becomes incandescent when in operation, presenting a cheerful appearance and furnishing a strong radiant heat.

THE MAYOR of PHILADELPHIA and Director of Public Works Windrim are working together in an effort to get the City Council to reduce the price of gas from $1.50 to $1 25 per 1000 feet.

THE MANHATTAN GAS HEATING COMPANY, New York, is the name of a new company incorporated, with a capital of $15,000, for the manufacture of heaters to burn natural, artificial and gasoline gases.

THE ENTIRE RESTAURANT OUTFIT of the Illinois Central Railroad at Chicago, including boilers, ranges, carving tables and urns, all for burning gas, was supplied by W. M. Crane & Co., New York.

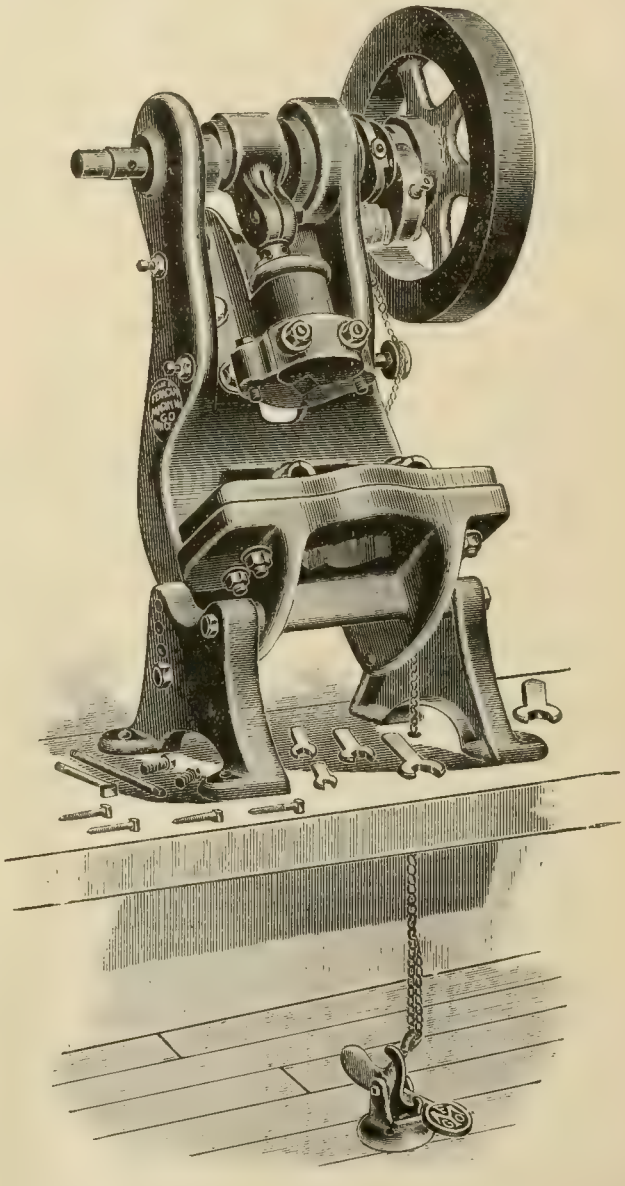
FREQUENT AND ENTERTAINING EXPLANATIONS of how to use gas and what can be accomplished with it for domestic purposes other than lighting, is advised for the extension of its use and benefits by those who have had most experience with the consumers. To this might be added some information on lighting.

The Ferracute Inclinable Bench Press.

A new inclinable power bench press has been recently brought out by the Ferracute Machine Company of Bridgeton, N. J., from designs by Oberlin Smith. By the makers' new system of classification it comes under Class C, cutting presses, and Series 100, bench presses. Being of the first size, it is known as press C101. It weighs 875 pounds. A second size, of the same design, known as press C102, weighs 1275 pounds. The picture shows the machine in wholly inclined position, from which it can be quickly changed by withdrawing and reinserting in other holes the two rear leg bolts. The treadle is provided with a lock by which it can be set to stop in the usual way each time the foot of the operator is raised, or so that it can remain down for continuous running. Its dimensions, &c., are as follows: Hole through bed 6 x 8 inches, rectangular, with an 8-inch round hole intersecting the same; hole through back, 11 inches; throat, from center of ram back to frame, 6 inches; hight from bed to ram when up, 9½ inches; stroke of ram, 2 inches; adjustment of ram, 3 inches; fly wheel, 24 x 3½ inches; weight of fly wheel, 230 pounds; revolutions of fly wheel per minute, 120; thickness of bolster, 2 inches; round hole in bolster, 4 inches; pressure safely exerted by ram, 12 tons Extra bolsters with various sizes of holes are also furnished to order. Such presses as these are adapted for a great variety of cutting, forming, spring drawing, &c, in sheet metals of all kinds, together with leather, paper, cloth, &c. The frame is so mounted upon its legs as to be quickly inclinable to any desired angle by the elevating screw, together with proper clamping nuts for securing the same.

This press has an unusually heavy ram, arranged with very long and wide bearings; an extra long pitman adjustment, graduated to hundredths of an inch; proper arrangements for clamping various kinds of punches; a positive knockout when desired, &c. The bolster can be made to order with various sizes of central holes, and is provided with die-clamps, adjustable in T-slots upon the top face thereof.

The shaft is of forged steel, with unusually large and long journals. In an enlargement of its solid metal is mounted an automatic stop-clutch of the utmost simplicity, and which, withal, has its different members so interlocked with each other in the process of assembling as to require no nuts or screws whatever, these being objectionable in a device of this kind, where the tendency is to constantly knock them loose. This clutch is provided with a safety lock which, while performing other functions incidentally, can be so manipulated as to prevent the press from starting while dies are being set, &c. A new and valuable feature consists in a so-called "clutch plate," carrying the tripping device, which is adjustable around the shaft's axis, thus allowing the clutch to be tripped either earlier or later than the normal, to accommodate itself to varying degrees of momentum in the shaft and parts attached thereto, this momentum being dependent upon the conditions of speed, lubrication, extra weights upon shaft (as cams, gears, pulleys, &c.), and other circumstances which usually have to be controlled entirely by a brake, thus in many cases losing a large amount of power. In the hub of the fly wheel, besides four hardened wheel studs for driving, there are also mounted self acting locking pins, which, while allowing the clutch slide in shaft ample time to enter spaces between wheel studs, finally lock the same after entering, and thus prevent the annoying back-lash incident to the use of spring-drawing dies and elastic work of various kinds.



INCLINABLE BENCH PRESS.

TRADE REPORT.

The Iron Market.

Chicago is the only locality which sends fairly cheerful news. From all other producing and distributing centers the reports are blue, in spite of a natural disposition to gather eagerly any indications pointing even distantly to better times. It is useless to deny that a feeling of sharp disappointment is becoming more and more general.

The simple fact is that there is not business enough going, by far, to keep those running even partially who have attempted to start. Every one of the works which have re-entered the list of active producers wants to cheapen cost by securing full employment. The result is a desperate struggle in which prices hitherto unheard of are made. It is useless to plead that special circumstances make such transactions exceptional. They are so numerous considering the small volume of business doing that they control the situation. It may seem paradoxical to state that the easing of the money market has made matters worse, and yet it is true that those who had advanced on merchandise or had given accomodations are putting on pressure now since they believe a course to be without serious danger which a month since would simply have crowded the borrower to the wall.

A survey of the whole field proves that consumption has not recovered sufficiently to give employment to many producers and that therefore the majority have the choice of stopping for a considerable period or of selling below cost. Those who do not have obligations to meet will probably take the former alternative.

In the New York market the lot of 1500 tons of warrant Charcoal Iron has been withdrawn from auction, and at the present time none of the bankers' holdings seem to be pressing. There are some indications, however, that merchants are selling at very low prices, in tributary markets, Pig Iron on which they had made advances. Reports of low offerings continue to be made in different quarters, and the market continues irregular and decidedly in buyers' favor. Makers of standard Irons report a moderate current business and a satisfactory rate of shipments, considering the light production. We quote Northern brands $14 @ $15 for No. 1; $13 @ $14.25 for No. 2, at tidewater. Southern Iron, same delivery, $13.25 @ $14.25 for No. 1; $12.25 @ $13.25 for No. 2; $11.50 @ $12.25 for No. 3; $11.75 @ $12.25 for No. 2 Soft, and $12.25 @ $12.50 for No. 1 Soft.

The demand in the Philadelphia district is reported as being of a very languid character, and although production is understood to be less than half of what it was six months ago, there is still more than enough to supply the demand. There is no particular pressure on standard brands, but once in a while outside lots are offered at prices below anything heretofore mentioned. At present only small lots are taken, and usually at prices about as follows for Philadelphia and equivalent points: $12.50 @ $13, delivered, for Plain No. 2, $13.75 @ $14.25 for No. 2x and $14.50 @ $14.75 for No. 1x.

From the Chicago district it is reported that there are at last symtons of a little hardening in prices. This is especially noticeable among sellers of Southern Coke Iron. The companies conspicuous for making low prices recently have either withdrawn from the market or advanced their figures beyond recent quotations, so that for the first time for several weeks the figures given below are not subject to concessions for prompt cash or large lots. Quite a number of season contracts both for Northern and Southern Coke were placed during the last week, and more contracts for local Coke are pending. Consumers generally are talking much more cheerfully, and report that if their trade continues to pick up as it is now doing they will soon need more Iron. Quotations are now as follows for cash:

Lake Superior Charcoal	$16.00	@	$16.50
Local Coke Foundry, No. 1	13.50	@	14.00
Local Coke Foundry, No. 2	12.75	@	13.00
Local Coke Foundry, No. 3	12.50	@	12.75
Local Scotch	14.00	@	14.50
Ohio Strong Softeners No. 1	15.50	@	16.00
Southern Silvery, No. 1		@	14.50
Southern Silvery, No. 2		@	14.00
Southern Coke, No. 2	12.35	@	12.60
Southern Coke, No. 3	11.60	@	11.85
Southern, No. 1, Soft	12.35	@	12.60
Southern, No. 2, Soft	11.85	@	12.10
Tennessee Charcoal, No. 1	16.00	@	16.50
Alabama Car Wheel	18.50	@	18.75
Hocking Valley, No. 1	15.25	@	16.00
Jackson County Silvery	16.00	@	17.00

Pittsburgh advices intimate that no business of any consequence is being done in Pig Iron at that center, and the industry is in a deplorable condition, with little prospect of immediate improvement, as it will take considerable time to work up stocks on hand, which at many of the furnaces are very heavy. In Foundry Irons there is little doing, the very low prices failing entirely to stimulate business. Considerable Iron from the Shenango Valley has been sold in that market at prices from $3 to $5 ℔ ton under our quotations, but the sales were made for the purpose of realizing cash. Quotations are given as follows:

No. 1 Foundry	12.75	@	13.00,	cash
No. 2 Foundry	11.75	@	12.00	"
Charcoal Foundry No. 1	14.00	@	15.00	"
Charcoal Foundry No. 2	13.00	@	14.00	"

The demand for Pig Iron during the week in Southern markets has been small, even for a dull season, although the two previous weeks were marked by considerable activity, and although low prices prevailed it was welcomed by the trade as the beginning of better things. The dilatory action of the Senate is, however, holding the manufacturing interests in check, and the hope of improvement has not been realized. Sales have been light, and while there does not appear to be any urgency to sell, it is apparent that Iron can yet be bought as low as ever. There is little Charcoal Iron selling, but the jobbing sales of small lots include nearly all kinds. For the time being the aspect of the market is discouraging. Quotations as follows:

Foundry.

Southern Coke, No. 1	$12.75	@	$13.00
Southern Coke No. 2	10.75	@	11.00
Southern Coke No. 3	10.25	@	10.50
Ohio Soft Stone Coal, No. 1	15.50	@	16.00
Ohio Soft Stone Coal, No. 2	14.50	@	14.75
Lake Superior Coke No. 1	15.00	@	15.25
Lake Superior Coke No. 2	14.00	@	14.25
Hanging Rock Charcoal, No. 1	18.50	@	19.00
Hanging Rock Charcoal, No. 2	17.50	@	18.00
Tennessee Charcoal, No. 1	14.00	@	14.25
Tennessee Charcoal, No. 2	13.00	@	13.25

Car Wheel and Malleable Irons.

Standard Southern Car Wheel	17.75	@	18.00
Lake Superior Car Wheel and Malleable	17.00	@	17.25

Metal Market.

Pig Tin.—The leading operators have continued to mark prices higher and on Tuesday succeeded in carrying the net cash rate for round lots up to 21¢ ℔ lb, making an advance of about ½¢ for the week, and, besides, narrowing the margin of difference between prices for deliveries for various options during the balance of the year to a very fine point. Some dealers who stocked up when prices were much lower have unloaded, in part at least, but there has been no sign of "short" selling, and the surface indications are that the statistical position has improved, since sales to interior dealers and consumers have been quite up to the average for the season. It is estimated that at least 450 tons have changed hands on the advance, nearly all for delivery during the next two or three weeks, and that the supply in first hands is now down to about four months' consumption, with the greater portion controlled by a few firms. Following the advance in wholesale prices, jobbers are now quoting an advance of

¼¢ ₱ lb on small lots of Pig Tin, for which the ruling prices are for Banca, 22½¢, and Straits 22¢. The retail demand shows considerable improvement over the past few months.

Copper.—The market is looking a little ragged. Semi-official data show that production is well up to the average. It is also a matter of record that exports latterly have been quite heavy, or considerably above the average for the first half of the year; yet there is no lack of evidence that current production suffices to make good the drafts upon old surplus, and the general report would warrant the statement that supply is running ahead of the demand, since sales have been difficult to make at prices that looked low at the close of last week's report. Close market prices just now are about 9¼¢ @ 9⅜¢ for Lake Superior Ingot; 9⅛¢ @ 9¼¢ for Electrolytic; and 9¼¢ for Common Casting brands, in wholesale quantities, for delivery during the balance of the year. Nothing more than strictly routine business on home account has been effected during the past week, and the demand at present is hardly up to the average. The price on small lots of Lake Superior Ingot shows some signs of weakness, ¼¢ less ₱ lb being quoted by dealers during the past day or two.

Sheet Copper.—There has been quite a brisk demand for Sheet Copper during the week. Although orders are still confined, in the main, to moderate quantities, their volume has increased, and a few comparatively important sales have been made within the past few days, while the general run of retail orders have a tendency toward calling for larger-sized lots than consumers have lately been inclined to take. It is said that some architectural contracts which have been pending during the late stress have now been consummated, and the Copper is required for work to be put in hand at once. On the whole, the volume of business doing is pretty well up to the average for the season, and largely in advance of anything that has been done for some months.

Pig Lead.—The official bullion price has been lowered to 3.65¢. Further than that there is no change, although the market has remained very quiet. There are buyers now at 3.75¢, regular, and sellers at 3.80¢ are comparatively few. Most holders ask 3.85¢ upward. In other words, the market is a "waiting" one and extremely uncertain for the time being, as well as unmistakably quiet in this quarter. There is no speculation worthy of the name and dealers and consumers operate with extreme caution, purchases of larger quantities than carload lots being almost unknown. The retail consumptive demand continues very light, quotations remaining unchanged.

Lead Pipe and Sheets.—The market for manufactured Lead shows no sign of increased activity. Plumbers' supplies are quiet, the demand being much below the average for the present season.

Spelter.—Hardly enough business has been done in this quarter to afford a fair idea of the status of the market for ordinary domestic brands. The offering is moderate, however, and the negotiation would indicate that surplus supplies have been cut down considerably since the recent curtailment of production. In any event the offering is smaller, and ordinary brands do not appear to be available at less than 3.80¢, landed here, for delivery during the balance of the year. For small lots of Western Spelter 4½¢ @ 4⅝¢ is asked, with but little demand from consumers.

Antimony.—The market has been quiet, but prices remain stationary. Cookson's is quoted at 11¢ ₱ lb, and Hallett's at 10½¢, for small quantities.

Tin Plates.—Business in the market for Tin Plates, although maintaining a very fair volume, has been somewhat quieter during the past day or two, due probably to buyers postponing their purchases until after the first of the coming month. A slackening down of orders toward the close of each month is, indeed, a feature of the trade which has become quite regular of late years, therefore the present condition is only in line with the usual experience of dealers. Ordinary Cokes have been in good demand for prompt delivery and prices for the same show some improvement, especially for certain sizes which are becoming scarce. Other Plates hold their own in price, with a very fair running demand, usually for immediate shipment. Stocks at the mills have become considerable reduced, and certain brands of domestic Ternes which are in favor are practically out of the market owing to orders running ahead of capacity of production. But little interest is yet manifested in future business, and shipments from the other side are likely to be restricted to bare requirements until something definite is known as to the probabilities of tariff legislation.

A special cable dispatch to *The Iron Age* dated September 27 reports the London market for Tin Plates to show a somewhat better feeling, but prices have undergone no radical change. The improvement has been chiefly in Oil sizes, for which several orders have been placed. A number of Welsh mills that were recently shut down because of miners' strikes have been restarted, and stocks at present are liberal. Liverpool quotations are as follows:

IC Charcoal, Alloway grade	12/9 @ 13/3
IC Bessemer Steel, Coke finish	11/6 @ 11/9
IC Siemens " " "	11/9 @ 12/
IC Coke, B V. grade, 14 x 20	11/6 @ 11/9
Charcoal Terne, Dean grade	@ 11/6

Sheet Iron.—A better demand for Black Iron is reported, for which, however, the increased output of the last few weeks is more than adequate. So much trade is done in this material directly between the consumers and the mills that the experience of jobbers is hardly a fair gauge of the volume of business that is going, which must be fairly large to meet the increased requirements of the Stove, Roofing and Galvanizing trades at this season. Galvanized Iron continues in steady demand, which is being fairly met in the resumption of operations by some manufacturers of this material both East and West.

Chicago Report.

Scrap.—Dealers report trade very dull. They offer the following rates, Chicago delivery, to country collectors:

	Per net ton.	Per lb
No. 1 Wrought Scrap	$7.00	....
Machinery Cast	6.00	....
Malleable Cast	5.00	....
Stove Plate (free of burnt)	4.00	....
Burnt Iron and Grate Bars	3.50	....
Sheet Iron and Hoops	2.00	....
Plow Steel and Breaking Stock	5.00	....
No. 2, such as Shovels, Hoes, &c	4.00	....
Old Boilers—whole (Iron)	4.00	....
" (Iron)—cut in single Sheets and Rings	6.00	....
Old Gas-Pipe and Boiler Tubes	5.00	....
Cast Borings	3.00	....
Turnings	4.00	....
Horseshoes	8.00	....
Copper Bottoms	....	5 ¢
Copper Clips and Heavy	....	6 ¢
Heavy Brass	....	5½¢
Light Brass	....	3½¢
Pipe Lead	....	2 1-10¢
Tea Lead	....	2 ¢
Zinc	....	2 ¢
Rubber	....	2 ¢

Anthracite.—Business is steadily becoming more active. An unusually cold snap for the season has prevailed throughout the Northwest this week. Carload lots of 12 net tons or over are quoted as follows:

	Grate.	Egg, Sto. and Ch.
Chicago, Ill	$5.85	$6.10
Milwaukee, Wis	5.85	6.10
Kansas City, Mo	9.05	9.30
Council Bluffs, Iowa	9.05	9.30
Lincoln, Neb	9.20	9.45
Sioux City, Iowa	9.05	9.30
Aberdeen, S. Dak	9.10	9.35
Dubuque, Iowa	7.15	7.40
Madison, Wis	7.35	7.60
St. Paul, Minn	8.35	8.60
Burlington, Iowa	7.35	7.60
Des Moines, Iowa	8.80	9.05
Davenport, Iowa	7.15	7.40
St. Joseph, Mo	9.05	9.30
Leavenworth, Kan	9.05	9.30
Omaha, Neb	9.05	9.30

Colorado Anthracite.

COLORADO FUEL & IRON COMPANY.

Denver	$8.00
Pueblo	8.00
Colorado Springs	8.00
Leadville	8.00
Cheyenne, Wyo	10.00
All points between Denver and Missouri River	9.35

WE ARE INDEBTED to Boas Brothers, 231–235 Greenwich street, New York, for a catalogue relating to Adamant Enameled Ware. The pamphlet contains 25 pages, illustrating a variety of goods of Adamant Ware, which is described as American shapes of German workmanship in standard styles. An extensive line of kitchen utensils and house-furnishing goods are enumerated, and a full list of sizes and prices is given. Boas Bros. also have a house in Hamburg.

CONDITION OF THE

Hardware Trade.

THE MARKET SHOWS but little change since our last review. The demand continues moderate and is perhaps not quite so heavy as a week or two ago. The trade are limiting their orders strictly to goods required immediately, and are showing a disposition to let their stock be exceptionally light or slightly broken rather than purchase at all freely. Manufacturers are quite generally resuming operations, but they are at the same time showing a conservative disposition not to produce many more goods than are quickly absorbed by the trade. It is gratifying to note the continued improvement in collections, and on this score there is much less complaint than a few weeks ago. The delay in the Senate in regard to the repeal of the Sherman act is causing some uneasiness.

Advices from Chicago.—The fall trade seems to have culminated, as business during the last week just about held its own with that of the previous weeks. The demand is still confined mainly to seasonable goods. General Hardware shows no improvement and jobbers are now satisfied that it will not improve until building becomes more active and industrial establishments are more fully employed throughout this district. Staple goods are moving in only moderate volume, which is perhaps less than that of two or three weeks ago. Brass Goods are doing somewhat better, and business is not quite so dull as it was in July and August. Tinware is in a little better request. The Heavy Hardware trade shows no change, the demand being confined almost entirely to Iron and Steel departments of such establishments. Collections are good, and little complaint is heard on this score.

Notes on Prices.

Wire Nails.—The demand for Wire Nails continues moderate, and in order to avoid accumulation of goods some of the mills are reducing production, with the possibility of shutting down before long if the conditions of trade do not soon show marked improvement. The orders received by them are for the most part for comparatively small lots, which are required promptly. In this condition of things it is not surprising that prices have weakened, and during the past week exceptionally low quotations have been made. The market at present is represented by the quotation of $1.30 to $1.35 for large lots at factory, some of the mills, however, refusing to meet these prices. The market is thus somewhat irregular, and the condition on the whole is far from satisfactory. It is understood that little progress is making in the negotiations which for some time have been carried on between the manufacturers in regard to an agreement for the regulation of production or prices, and in the present state of the matter it is not thought that it will be immediately consummated.

Advices from Chicago.—Manufacturers of Wire Nails report a good trade the past week, but it was confined to orders for immediate shipment. The influence of present business does not project itself far into the future, as some factories are again making arrangements to shut down, to remain closed until trade makes some decided improvement. The market is irregular owing to the efforts of certain manufacturers to unload some of their stock, although it is not understood to be heavy. General quotations for shipment from factory are about $1 45, Chicago. Jobbers continue to quote small lots from stock at $1.55 to $1.60.

Cut Nails.—With the small amount of building at the present time there is naturally only a moderate demand for Nails, and the Cut-Nail market is decidedly sluggish. In sympathy with the lower prices ruling for Wire Nails, both Steel and Iron Cut Nails are weak in price. The market is represented by the quotation of $1 for carload lots at mill, but it is understood that in some cases where the order is attractive, especially in the way of average, slight concessions are sometimes made. Small lots from store in New York are held at $1.25 to $1.30.

Advices from Chicago.—Manufacturers of Cut Steel Nails report a good condition of business for the season, but orders are confined to carload lots and seldom run heavier. Prices are maintained at $1 20 to $1.25 for factory lots, while jobbers quote small lots from stock at $1.30.

Barb Wire.—The demand for Barb Wire is moderate, and with more or less solicitude on the part of manufacturers to secure business prices are naturally somewhat irregular and slightly lower. The market is represented by the quotation of $2.30 to $2.40 for carload lots of Four-Point Galvanized at mill. Small lots from store are quoted at about the usual advance.

Advices from Chicago.—The Barb-Wire manufacturers are now cultivating the retail trade, and have consequently affected the price of small lots from stock. They are selling mixed carloads of Wire Nails and Barb Wire to this trade, and are absorbing a very large part of such business. Quotations on Barb Wire sold in this way are $2.55 for Galvanized, but this is shaded to the best buyers. Carload prices continue to run about $2.45 for Galvanized, with the usual difference on Painted. The Barb-Wire trade has grown somewhat better in volume, but is not yet up to what it should be at this season of the year.

Wrought-Iron Pipe.—The Wrought-Iron Pipe market is fairly regular in price, and there is a moderate but not heavy volume of business.

New Power Corkscrew.—This Corkscrew, manufactured by the C. T. Williamson Wire Novelty Company, Newark, N. J., is sold from the following list, which is subject to a discount of 40 per cent. to the trade:

	Per dozen.
No. 1243, nickel-plated applewood handle	$5.00
No. 1443, " " rosewood handle	5.50

Perfect Saw Jointer.—E. Bertram Pike, Pike Station, N. H., is putting this article on the market. It is sold to the trade at $6 per dozen, subject to a discount of 33⅓ per cent.

Glass.—The demand for Window Glass continues in about the same proportions as during the past two or three weeks, and stocks are becoming proportionately reduced. It is not now an uncommon thing to have orders but partially filled by manufacturers, and reports come of Eastern factories preparing to resume operations. Some of the Plate Glass factories are getting ready to finish up the rough Glass on hand. No understanding has yet been reached regarding wages for the coming season between Window-Glass manufacturers and workmen, and no changes in quotations have occurred.

Old Metals.—The market for Old Metals continued in the same condition of torpor that was noted last week. Prices are irregular, and the total volume of business done makes a very poor showing. Many holders of Scrap Iron are said to be disinclined to part with their stock at the present low prices, hoping for some improvement in the near future. Nevertheless, we hear of others who urgently require ready money, but who are unable to find a market for their holdings at even a concession on lowest quoted prices. The following quotations represent about the outside prices paid for Old Material in New York:

Heavy Copper	℔	lb	6⅜¢
Light and Tinned Copper	℔	lb	6½¢
Heavy Brass	℔	lb	5¼¢
Light Brass	℔	lb	4⅛¢
Lead	℔	lb	2¾¢
Tea Lead	℔	lb	2½¢
Zinc	℔	lb	2½¢
No. 1 Pewter	℔	lb	14¢
No. 2 Pewter	℔	lb	6¢
Wrought Scrap Iron ℔ gross ton	$13.00	@	$14.00
Heavy Cast Scrap ℔ gross ton	11.50	@	12.50
Stove Plate Scrap ℔ gross ton	7.00	@	8.00
Burnt Iron (delivered at mill) ℔ gross ton	5.00	@	6.00

Old Rags, Paper, &c.—No improvement is noticed in the market for Old Rags, Paper, &c., which continues dull, with prices as follows, delivered in New York:

No. 1 White Rags	℔	lb	3¼	@	3½
No. 2 White Rags	℔	lb	2⅝	@	2¾¢
Mixed Rags	℔	lb			2¼¢
Blues and 3ds	℔	lb	1	@	1¼¢
Hard Sized White Shavings	℔	lb			2¼¢
No. 1 White Book Shavings	℔	lb	1¾	@	2 ¢

No. 2 White Book Shavings	℔	1	@	1 1/8¢
Light Book Shavings	℔			3/4¢
No. 1 Mixed Shavings	℔			3/4¢
No. 2 Mixed Shavings	℔			1/2¢
No. 1 Printed Books	℔			1 ¢
Ordinary Mixed Books	℔	1/2	@	3/4¢
Newspapers	℔			3-5¢
No. 1 Manila Paper	℔	7/8	@	1 ¢
No. 2 Manila Paper	℔	5/8	@	3/4¢
Bogus Paper	℔			1/2¢
Common Paper	℔	3/4	@	1/2¢
Straw Chips	℔	1/2	@	5/8¢
Binders' Clippings	℔	1/2	@	9/16¢
Jute Butts	℔	1 1/8	@	1 1/4¢
No. 1 Jute Bagging	℔			1 ¢
Mixed Bagging	℔	3/4	@	1 ¢
No. 2 Bagging	℔	1/2	@	3/4¢
Hemp Twine	℔			2 1/4¢
Manila Rope	℔			2 1/2¢
Jute Rope	℔	1 1/2	@	1 3/4¢
Mixed Rope	℔	3/4	@	7/8¢

Old Rubber.—The movement in this material is of the slightest character, and prices for New York delivery are quoted approximately as follows :

Car Springs, ton lots, ℔ lb.	....	@	$0.03 1/4
Rubber Shoes, carloads, delivered at factory, ℔ lb.	....	@	.03
Rubber shoes, less than carloads, ℔ lb.	0.02 1/4	@	.03 1/8
Large Hose, ℔ ton	....	@	9.00
White Wringer Rolls, ℔ lb.	....	@	.04 1/4
White Syringes, ℔ lb.	....	@	.05

Trade Notes.

I. P. FRINK 557 Pearl street, New York, is in receipt of a very flattering letter from H. M. Danforth, pastor of the Methodist Episcopal Church at New York Mills, N. Y., in which he refers to two 60-inch Frink Reflectors put in his church a year ago, and which have given most excellent results, furnishing a clear and brilliant light in all parts of the building.

FRANCIS I. MAULE, for many years a partner in the late firm of Pancoast & Maule, manufacturers of and dealers in steamfitters' supplies, Philadelphia, has recently opened an office at 328 Chestnut street, in that city, where he is prepared to undertake the preparation of advertising matter, or as he terms it in his announcements, the "manufacture of notoriety." During Mr. Maule's connection with the firm mentioned all the bright and catchy advertisements put out by them and so familiar to the trade were formulated by him. With his large experience his services should prove valuable to all needing assistance in this direction.

ON SATURDAY, September 23, the employees of the Republic Iron Works, manufacturers of Iron and Steel Sheets, South Side, Pittsburgh, Pa., were notified that operations would be resumed at once. During the shut down extensive repairs were made, and the works are now in shape for a steady run.

THE SANDWICH ENTERPRISE COMPANY, Sandwich, Ill., last week filled an order for several of their patent aërating cistern pumps to go to South Africa. One these pumps is exhibited by the company at the World's Fair in a booth in Machinery Hall, and attracts, we are advised, much attention from visitors.

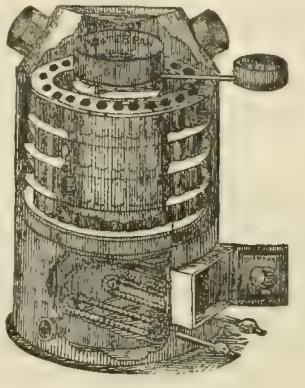
THE STUART & PETERSON COMPANY of Burlington, N. J., manufacturers of Hollow Ware, recently received a communication from a merchant in Zanzibar, in which reference was made to the high reputation of their goods in that country.

A HANDSOME DISPLAY of Venetian iron work and brass work in Table Lamps, Piano Lamps, Music Racks and Tables, in which there is a free use of onyx and Japanese pottery, will be found at the New York office of the Matthews & Willard Mfg. Company at 40 Murray street. Mantel Urns, Pitchers, Ewers and Statuettes form a handsome line of ornamental goods.

THE FOUNDRY of the White Mountain Freezer Company, Nashua, N. H., has been started up on full time.

Pennsylvania Gas Furnace.

In the broken view presented herewith we show what is known as the Pennsylvania gas furnace, manufactured by R. Edmonds & Son, Warren, Pa. The furnace, as its name indicates, is constructed especially for using gas as a fuel, and the manufacturers claim



Pennsylvania Gas Furnace.

that the severe tests to which it has been subjected show it to be economical and satisfactory in operation. The engraving which we present clearly illustrates the general plan of construction. Edmonds & Son report a gratifying demand for the heater, and are running their plant nights in order to keep up with orders. The business is growing so rapidly that the present manufacturing facilities are inadequate, and new works are said to be contemplated in the near future.

The ventilating plant for the Post Graduate Hospital at Brooklyn, N. Y., will require 27 fans and the same number of electric motors. Some idea can be gained from this of its proportions and the engineering skill that will be required for its installation. That such a contract should be eagely sought is natural, but that the number of bids should be overwhelming and far exceed the number of establishments capable of fulfilling and responsible for so large a contract is a surprise. The bids were to have been opened on the 29th, and the rumor among the trade on the 28th was to the effect that already 68 bids had been filed and enough more were in course of preparation, to be yet handed in, to make a total of 100. The past summer has not been as satisfactory to the fan trade as was desired and may to some extent account for the excessive number of bids in this case. From the same source comes the suggestion that the specifications will have to be materially modified if the apparatus is to prove as efficient as similar apparatus when arranged in accordance with the ideas of experienced ventilating engineers. This, however, is likely to occur with any large work, and if the contract is awarded to a competent house consultation between their expert and the supervisor of the building will remedy all conflicting details.

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Metal and Miscellaneous Prices.

CHICAGO, SEPTEMBER 28, 1893.

Tin—
Straits pigs.....22½¢

Imported Tin Plates—
Charcoal Plates.—Bright.

Guaranteed Plates command special prices, according to quality.

		Per box.
Calland and Melyn Grade	IC, 10 x 14	@ $6.75
	IC, 12 x 12	@ 6.75
	IC, 14 x 20	@ 6.75
	IC, 20 x 28	@ 13.50
	IX, 10 x 14	@ 8.75
	IX, 12 x 12	@ 8.75
	IX, 14 x 20	@ 8.75
	IX, 20 x 28	@ 17.50
	DC, 12½ x 17	@ 6.50
	DX, 12½ x 17	@ 8.50
Allaway Grade,	IC, 10 x 14	@ 6.50
"	IC, 12 x 12	@ 6.50
"	IC, 14 x 20	@ 6.50
"	IC, 20 x 28	@ 13.00
"	IX, 14 x 20	@ 8.00
"	IX, 20 x 28	@ 16.00

Coke Plates—Bright.

	Per box.
Steel Coke—IC, 10x14.14x20.	$5.85 @ $6.00
IC, 14x20.90 ℔	5.60 @ 5.75
IC, 14x20, 100℔	@ 5.85
10 x 20	8.75 @ 9.00
20 x 28	11.70 @ 12.00
X, 10x14, 14 x 20	@ 7.50
B.V. Grade. IC, 10x14, 14x20.	5.85@ 6.00

Charcoal Plates.—Terne.

Guaranteed Plates command special prices, according to quality.

Hansel and Dean Grades.—	
IC. 14 x 20	@ $5.62½
20 x 28	@ 11.25
IX. 20 x 28	@ 14.25
Worcester Brand and equal.—	
IC, 14 x 20	6.12½@ .....
IC, 20 x 28	12.25 @ .....
IX, 14 x 20	7.62½@ .....
20 x 28	15.25 @ .....

American Tin Plates.
Charcoal Plates.—Bright.

Irondale, A. A.—IC, 14 x 20	$7.00
" " IX, 14 x 20	9.00
" " IXX, 14 x 20	11.00
" " IC, 20 x 28	14.00
" " IX, 20 x 28	18.00
" " IXX, 20 x 28	22 00
Florence.—	
IC, 10 x 14, 12 x 12, 14 x 20..	$6.75
IX, 10 x 14, 12 x 12, 14 x 20..	8.50
Palma.—	
IC, 10 x 14, 12 x 12, 14 x 20..	$7.25
IX, 10 x 14, 12 x 12, 14 x 20..	9.25
Each extra cross $2.00 and 20 x 28 double these prices.	
Brilliant, Tissue Packed, IC, 14 x 20.	$9.25
Royal, extra, IC, 14 x 20	7.25
Merion, IC, 14 x 20	7.00
Almond, IC, 14 x 20	6.50
Mint, IC, 14 x 20	6.25

Coke Plates.—Bright.

Elwood.—IC, 14 x 20	$6.00
" IC, 20 x 28	12.50

Roofing Plates.

Arch, IC, 20 x 28	@ $11.75
Crescent, IC, 20 x 28	@ 12.25
Crescent, IX, 20 x 28	@ 15.25
Empire, IC, 20 x 28	@12 50
Empire, IX, 20 x 28	@15.50
Hickory, IC, 20 x 28	@ 12.75
" IX, 20 x 28	@ 15.75
Alaska (heavily coated), IC, 20x28	@$14.50
Alaska IX, 20 x 28	@ 17.75
Special, IC, 20 x 28	@ 15.50
" IX, 20 x 28	@ 18.50
Merchant's Roofing (extra coated), IC, 20 x 28	@$17.75
Merchant's Roofing (extra coated), IX, 20 x 28	@$21.50
Merchant's Old Method, (extra heavily coated), IC, 20 x 28	@$19.75
Merchant's Old Method (extra heavily coated), IX, 20 x 28	$23.60
Irondale A:	
IC, 14 x 20	$6.25
IX, 14 x 20	7.75
IC, 20 x 28	12.50
IX, 20 x 28	15.50
Westmoreland:	
IC, 14 x 20	$6.25
IC, 20 x 28	12.50
Elwood:	
IC, 20 x 28	$12.00
Juno:	
IC, 14 x 20	$5.75
IC, 20 x 28	11.50
Illinois, Old Method:	
IC, 20 x 28	$17.00
E. L.:	
IC, 20 x 28	$12.50
Jessie:	
IC, 20 x 28	$12.00
Scott's Extra Coated, Stamped and Resqured, IC, 14 x 20	$9.50
Scott's Extra Coated, Stamped and Resqured, IX, 14 x 20	11.00
Scott's Extra Coated, Stamped and Resqured, IC, 20 x 28	19.00
Scott's Extra Coated, Stamped and Resqured, IX, 20 x 28	22.00
Neville, Stamped, IC, 14 x 20	6.25
" " IX, 14 x 20	7.50
" " IC, 20 x 28	12.50
" " IX, 20 x 28	15.00
Taylor's Old Style, IC, 14 x 20 (Stamped and Resqured)	$9.50
Taylor's Old Style, IC, 20 x 28 (Stamped and Resqured)	19.00
Taylor's Roofing, IC, 14 x 20 (Stamped and Resqured)	8.25
Taylor's Roofing, IC, 20 x 28 (Stamped and Resqured)	16.50
Columbia, IC, 14 x 20 (Stamped)	7.25
" IC, 20 x 28 (Stamped)	14.50
Maple, IC, 14 x 20 (Stamped)	6.75
" IC, 20 x 28 (Stamped)	13.50
Willow, IC, 14 x 20	6.50
" IC, 20 x 28	13.00
Knoxall, IC, 14 x 20	6.25
" IC, 20 x 28	12.50
Globe, IC, 14 x 20	6.00
" IC, 20 x 28	12.00
Miami, IC, 14 x 20	6.00
" IC, 20 x 28	12.00
" IX, 20 x 28	15.00
" (Redipped), IC, 20 x 28	17.00

Tin Boiler Plates.

	Per box of 100 sheets.	Per box of 112 sheets.
X, 14 x 28	$13.00	$13.00
XX, 14 x 28	14.50	14.50
X, 14 x 31	14.50	15.80
XX, 14 x 31	16.50	17.50

	Per box of 56 sheets.	
X, 14 x 56	29.50	16.50
XX, 14 x 56	32.50	18.20
X, 14 x 60	31.50	17.65
XX, 14 x 60	35.50	20.90

Sheet Iron—
Black.

	Common American	Refined.
Nos. 10 to 16	℔ 2 6 10¢	3 2-10¢
17 to 20	℔ 2 7-10¢	3 3-10¢
21 to 24	℔ 2 8-10¢	3 4-10¢
25 and 26	℔ 2 9-10¢	3 5-10¢
27	℔ 3¢	3 6 10¢

Russia, Planished, &c.

Genuine Russia, all numbers....13¢ net.
Patent Planished....℔ A, 10½¢; B, 9½¢ dis. 5%
Craig's Polished.....8½¢

Galvanized.

Juniata or first quality.....dis. 70&5%

Copper—
Ingot.

Lake.....11¾¢ @ 12¼¢
Casting Brands.....11¢ @ 11½¢

Sheet and Bolt.

Discount, 25%.

Copper Bottoms.

Discount, 25%.

Seamless Brass and Copper Tubes.

Base price, 17½¢, Chicago, with extras according to size.

Copper, Bronze and Gilding Tube, 3¢ ℔ additional.

Brazed Brass Tubing.
(To No. 20 inclusive.)

Add freight from New York to Chicago to these prices, or 50¢ ℔ 100 ℔.

Above 5-16 inch to 3 inch inclu.	35¢
Plain, above 3 inch	45¢
Plain, 5-16 inch	45¢
Plain, ¼ inch	60¢
Plain, 3-16 inch	$1.00
Plain, ⅛ inch	$1.50
Fancy Tubing, Brass, to No. 20 incl.	43¢ ℔
Bronze Tubing, 3¢ ℔ ℔ more than Brass.	

40 @ 45 %

Roll and Sheet Brass.

Discount, 35 @ 40%.

Slab Spelter—
Western Spelter.....5

Sheet Zinc—
600 ℔ casks.....5
300 ℔ casks.....5¼¢
Loose sheets.....5½¢

Lead—
Soft Pig Lead.....4¼¢
Bar.....4.60¢@5¢
Pipe.....5½¢, dis. 10¢
Block Tin Pipe.....35¢
Sheet.....6¢, dis. 10%

Solder—
½&½.....13¢@13¼¢
Extra Wiping.....11½¢

The prices of the many other qualities of Solder in the market indicated by private brands vary according to composition.

Antimony—
Cookson.....12¢@12½¢
Hallett's.....11½¢@11½¢

Wrought-Iron Pipe—
List on following page.

1½ and under, Plain	57½&10%
1¼ and under, Galv	52½&10%
1½ and over, Plain	67½&10%
1½ and over, Galv	60&10%
Boiler Tubes, list Oct. 24, 1892	65@67½%
Casing, list Nov. 16, 1892	52½%
Inserted Joints Casing, list Nov. 16, 1892	47½%
Steel Boiler Tubes	27½%
Cold Drawn Seamless Steel Tubing	50%

Cast-Iron Soil Pipe—
Cast-Iron Soil-Pipe, Tarred; sizes 2 to 6 inches, inclusive.....dis 70&2½%
Other sizes.....dis 60%

Leader Pipes—

Abendroth's Galv. Spiral Riveted	60%
Austin's Corrugated	60%
Gordon & Gilbert's Corrugated	60%
Ritchie's (Galv. Iron only) Cor'd	60%
Ritchie's Spiral Lock Seam, Galv'd	55%
Austin's Spiral Ribbed Pipe	60%
Plain Adjustable Elbows	60%
James A. Miller Bros. (Galv'd Iron only) Corrugated	60%

Furnace Fittings—
Discount from Excelsior Steel Furnace Co.'s list.....50%

Steel Roofing—

Perfection	$3.75 square
Climax	$3.50 square
The Lloyd Spanish Tiling	$4.50 square

Metallic Shingles—

Cushman's	$1.25 square
Merchant & Co.'s Spanish Tiles:	
Copper, 14 oz	$36.00 square
Tin	$9.75@$14.25 square
Steel, painted	$9.00 square

Drain Pipe—
Discount from list.....50%

Paints Oils, &c.—

Deodorized Benzine	7½@8 ¢
Iron Paint, Bright Red	℔ D, 2 ¢
" " Brown	℔ D, 1½¢
" " Purple	℔ D, 2½¢
" Ground in oil, B. Red	℔ D, 6½¢
" Ground in oil, Red	℔ D, 6½¢
" Ground in oil, Brown	℔ D, 5½¢
" Ground in oil, Purple	℔ D, 6 ¢
Linseed Oil, Boiled, in bbls	53¢
Linseed Oil, Raw, in bbls	50¢
Mineral Paints	2@4¢
Orange Mineral	10¢
Pure White Lead in Oil	6¾@7¼¢
Dry White Lead in bbls	6¼@6¾¢
Red Lead, American	7@7½¢
Red Venetian, English, dry	$1.65@$1.70
Red Venetian in oil; asst'd cans, 8½¢; kegs	7½¢
Sipe's Japan Oil, in bbls, ℔ gal	34¢
Spirits Turpentine, in bbls., ℔ gal	32½¢
Asphaltum, Trinidad Refined, ℔ ton	$45
Tarred Felt, 1 Ply, ℔ 100 ℔	$1.65
Tarred Felt, 2 Ply, ℔ roll 108 sq. feet	$1.50
Tarred Felt, 3 Ply, ℔ roll of 108 sq. feet	$2.00
Roofing Pitch, ℔ bbl. of 300 ℔	$3.20

NEW YORK, SEPTEMBER 29, 1893.

The following quotations are for small lots.

Aluminum—
No. 2 Grade Metal, in ton lots..℔ D, $0.75
No 1 (guaranteed to be 98 % pure and over), in ton lots .....℔ D .90
Lots less than 1 ton, 10¢ ℔ D additional.

Antimony—
Cookson .....℔ D, 11¢
Hallett's.....℔ D, 10½¢

Brass—
Planished.....net
Roll and Sheet.....35@40%

Brass and Copper Tubes
Brazed Brass Tubing—
List May 20, 1889.

	Per D.
Plain, to No. 20 inclusive, above 5-16 inch to 3 inch inclusive	$0.35
Plain, to No. 20, above 3 inch	45
Plain, 5-16 inch to No. 20	45
Plain, ¼ inch	60
Plain, 3-16 inch	1.00
Plain, ⅛ inch	1.50
Fancy Tubing to No. 20, inclu	43

35@40%

Copper and Bronze Tubing—
3¢ ℔ D more than brass.

Bronze, Tobin—
Drawn Rods for Bolts, Forgings, &c

Over ¼ to 3⅛ inches inclusive....17¢ ℔ D
Over 3⅛ to 5 inches inclusive.....18¢ ℔ D

Piston Rods, Finished True, Smooth and Straight.

Over ¼ to 3⅛ inches inclusive....18¢ ℔ D
Over 3⅛ to 5 inches inclusive.....19¢ ℔ D

Clips—
Buffalo Damper: Nos. 1, $1.25; 2, $2.50 per doz.....40&10%

Conductors—
Corrugated. *Round or Square—*

Galvanized	60%
Galvanized, Locked Joints	60%
Tin	60%

Spiral Riveted—

Galvanized	50%

See also *Elbows and Shoes; Eave-Trough Miters; Strainers, Conductor.*

Conductor Strainers—See *Strainers, Conductor.*

Copper—
Bottoms, Pits and Flats....25@25&5%

Ingot.

Lake.....10¾¢
Ansonia Grade Arizona.....10½¢
Ansonia Grade Casting.....10¢
Planished.....net
Sheet and Bolt.....25&25&5%

Tubes—See *Seamless Brass Tubes.*

Coppers, Soldering—
See *Irons, Soldering*, in Current Hardware Prices.

Damper Clips Buffalo—
See Clips, Buffalo Damper.

Eave Troughs—
Lap or Slip Joint, Galvanized.....60&10%
Lap or Slip Joint, Terne.....60%

Eave-Trough Mitres—
Lap or Slip Joint.....list, net

Elbows—
Plain Adjustable—

Tin	70%
Galvanized	70%

Crimped Tubing—

Re-Tinned or Galvanized	35%

Stove-Pipe—
Buffalo Four-Piece.

4½	5	5½	6	7 inch,
$0.78	.87	.90	.99	1.20 per doz.

..20 %

Elbows and Shoes—
Flat Crimp.

Tin	35%
Galvanized	35%

Corrugated.
Flat Crimp.

Galvanized	60%

Round or Square.

Tin	60%
Galvanized	60%

Iron, Sheet—
Black.

	Common American.	R. G. Cleaned American.
Nos. 10 to 16	℔ D, 2¾	3.10¢
Nos. 17 to 20	℔ D, 2.85	3.10¢
Nos. 21 to 24	℔ D, 2.90	3.20¢
Nos. 25 and 26	℔ D, 3.05	3.30¢
No. 27	℔ D, 3.15	3.40¢
No. 28	℔ D, 3¼	3½¢
American B. B.	℔ D, 4¢@4½¢	

Russia, Planished, &c.

Genuine Russia, according to assortment.....℔ D, 11¾@12½¢
Patent Planished....℔ D, A, 10¢; B, 9¢, 5%
Craig Polished Sheet.....℔ D, 8½¢

Galvanized.

	B. B.
Nos. 10 to 16	70&2½% @ 70&5%
Nos. 17 to 22	
Nos. 23 to 24	
Nos. 25 to 26	
No. 27	
No. 28	
Nos. 29 and 30	

Filter Joints—
Lee's.....33⅓

Lead—

American Pig	4¼¢@4⅜¢
Bar	4¾¢
Pipe	6¼¢, 20%
Tin Lined Pipe	15¢, 20%
Block Tin Pipe	37½¢, 20%
Sheet	7¢, 20%

Old Lead in exchange, 3½¢ ℔ D.

Metal, Expanded—
Manufacturers' list No. 5.

Lathing	10%
Fencing, Painted Sheets	20%
Netting, Painted Sheets	20%
Door Mats, Galvanized	25%
Window Guards, Paneled	15%
Tree Guards, Paneled	15%

Mitres Eave-Trough—See *Eave-Trough Mitres.*

Paints Oils &c.—

Lead, Amn. White, in oil	6¾ @ 7¾
Lead, Red, bbls. and ⅛ bbls	6½ @ 7
Lead, Red, kegs	6½ @ 7
Ocher, American	1 @ 1¾
Red, Venetian, American	1½ @ 2½

Linseed Oil:
Raw, ₩ gal..... @ .40
Boiled..... @ .43

Spirits Turpentine:
In bbls..... @ .32

Putty:
In barrels and ½ bbls..... .01⅝ @ .01¾
In tubs..... .01⅝ @ .01¾
In tin cans..... .01½ @ .02⅛
In bladders..... .01⅞ @ .02¼

Roofing Material, &c.:
Asphaltum, Trinidad Refined, ₩ ton..... $30.00@$35.00
Asphaltum, Rock, ₩ ton..... $14.00
Coal Tar Felt, 1 Ply, ₩ ℔..... 2¢
Coal Tar Felt, 2 Ply, ₩ roll 108 sq. ft..... $1.42½
Coal Tar Felt, 3 Ply, ₩ roll 108 sq. ft..... $1.85
Roofing Pitch, ₩ bbl..... $2.25

Pipe, Drain 50%

Pipe and Fittings, Cast Iron Soil—

Cast-Iron Soil Pipe, Tarred, sizes 2 to 6 Inches, inclusive..... 60@60&10%
Other sizes..... 55@55&10%
Cast-Iron Fittings, Tarred, sizes 2 to 6 inches..... 60@60&10%
Other sizes..... 55@55&10%

Pipe, Spiral—

Galvanized..... 60%
Tin..... 60

Rock and Slag Wool—

	₩ ℔	₩ cub. foot.
Slag Wool, ordinary	1¼	15¢
Slag Wool, extra	4¼	38½¢
Rock Wool, ordinary	2¼	27¢
Rock Wool, extra	7¼	43½¢

Rosin—

Common and Good—Strained,
Rosin, C. & D..... ₩ bbl. $1.02@$1.05
Rosin, E. & F..... ₩ bbl. $1.15@$1.30
Rosin, G. & H..... ₩ bbl. $1.45@$1.70
Rosin, I. & K..... ₩ bbl. $1.90@$2.35
Rosin, M. & N..... ₩ bbl $2.50@$3.50

Seamless Brass Tubes..net

Shoes and Elbows—See *Elbows and Shoes.*

Slate Roofing—

According to size, f.o.b. cars, Quarry Station.

Pennsylvania:
Best Bangor, ₩ sqr..... $3.25@$4.50
Pen Argyle, ₩ sqr..... 3.50@ 4.25
Peach Bottom, ₩ sqr..... 5.00@ 6.25
No. 1 Chapman, ₩ sqr..... 4.00@ 4.65
Lehigh Slates, ₩ sqr..... 3.00@ 4.50
Vermont:
Sea Green, ₩ sqr..... 2.70@ 3.20
Purple, ₩ sqr..... 3.50@ 4.50
Unfading Green, ₩ sqr..... 3.50@ 4.00
Red, ₩ sqr..... 9.75@12.00

Solder and Soldering Fluids—

Solder—

½ & ½ (Guaranteed)..... 13½@14½¢
No. 1..... 11⅝@12 ¢
Prices of Solder indicated by private brands vary according to composition.

Soldering Fluids—

Concentrated Soldering Flux.
f.o.b. New York.
In barrels, ₩ ℔..... 4¢
Smaller quantities, ₩ ℔..... 5¢

Gedney's Soldering Fluid.
In carboys or barrels, ₩ ℔..... 2¢
$1.50 for carboy or barrel; money refunded when returned.

Perfection Soldering Flux.
No charge for package.
Bbls., about 500 ℔, ₩ ℔..... 3½¢
½ bbls., about 300 ℔, ₩ ℔..... 4¢
Kegs, about 110 ℔, ₩ ℔..... 4¢
75¢ extra for keg. } 5% dis.
Kegs, about 55 ℔, ₩ ℔..... 4¢

Yager's Soldering Salts.
½-℔ bottles, each..... 30¢
Large quantities, per ℔..... 40¢

Spelter—

Western Spelter..... 4½¢@4¾¢
Bertha..... 8¼¢@9¢

Spiral Pipe—See *Pipe, Spiral.*

Stove-Pipe Elbows—*See Elbows, Stove Pipe.*

Stove Polish—See *Polish, Stove*

Stove Trucks—See *Trucks, Stove.*

Strainers Conductor—

Galvanized..... 60%

Tin, Pigs and Bars—

Banca, pigs, ₩ ℔..... 22½¢
Straits, pigs, ₩ ℔..... 22¢
Straits in bars, ₩ ℔..... 23¢

Tin Plates

American Terne Plates—

Alaska (re-squared) IC, 14 x 20	$7.00
Alderly, extra quality, IC, 14 x 20	6.37½
Allegheny, IC, 14 x 20	6.12
" IX, 14 x 20	6 38
Apollo Roofing, IC, 14 x 20	6.25
" " IX, 14 x 20	7.25
Bonus, Extra Coated, IC, 14 x 20	6.75
" " IX, 14 x 20	8.25
Buckeye, IC, 14 x 20	7.00
" IX, 14 x 20	8.25
Chicago, IC, 20 x 28	11.50
Central, IC, 14 x 20	5.37½
Climax, IC, 14 x 20	5.70
Columbia, IC, 14 x 20	7 00
Crescent, IC, 14 x 20	6.00
Dunlap's Double Dipped, IC, 14 x 20	8.25
" " " IX, 14 x 20	9.50
" Domestic, IC, 20 x 28	12.00
" " IX, 20 x 28	15.00
Empire, IC, 14 x 20	6.12½
Extra Central, IC, 14 x 20	5.62½
First New York, IC, 14 x 20	5.75
First New Jersey, IC, 14 x 20	5.75
Flag, IC, 14 x 20	5.50
Fort Pitt, IC, 20 x 28	11.00
Globe, IC, 14 x 20	5.75
Hamilton's Best Redipped, IC, 14x20	9.25
" " " IX, 14x20	10.75
Hickory (Resquared), IC, 14 x 20	6 37½
Juno, IC, 14 x 20	5.75
Kensington, IC, 14 x 20	6.75
" IX, 14 x 20	8.00
Knoxall, IC, 14 x 20	6.00
Laufman's Apollo (Resquared), IC, 14 x 20	8.12
Laufman's Apollo (Resquared), IX, 14 x 20	9.37
Leominster, Extra Coated, IC, 14x20	7.75
Lion (Stamped), IC, 14 x 20	6.25
Lula, Best Charcoal, IC, 20 x 28	12.50
" " IX, 20 x 28	16.00
Manhattan, IC, 14 x 20	7.00
Maple, IC, 14 x 20	6.50
Merchant's Old Method (Resquared), IC, 14 x 20	9.50
Merchant's Roofing (Resquared), IC, 14 x 20	8.50
McKinley, IC, 20 x 28	12.00
" IX, 20 x 28	15.00
Neville, IC, 14 x 20	6.00
" IX, 14 x 20	7.25
N. F. Old Style, IC, 14 x 20	7.50
" " " IX, 14 x 20	9.00
Old Colony, IC, 14 x 20	8.00
Optimus, Best Redipped, IC, 14 x 20	8.25
" " " IX, 14 x 20	9.50
Osceola, Hand Coated, IC, 14 x 20	8.25
" " " IX, 14 x 20	9.75
Palacio, IC, 14 x 20	5.55
Pennsylvania Old Method (Treble Coated), IC, 14 x 20	8.50
Phœnix, IC, 14 x 20	5.80
Scott's Extra Coated (Resquared), IC, 14 x 20	9.25
Scott's Extra Coated (Resquared), IX, 14 x 20	10.75
Taylor Old Style (Resquared), IC, 14 x 20	9.25
Taylor Roofing, IC, 14 x 20	8.00
Thompson's Puritan, IC, 14 x 20	5.75
Tip Top, IC (Resquared), 14 x 20	6.62
" IX " 14 x 20	7.88
U. S. Monongahela, IC, 14 x 20	6.50
U. S. Redipped, IC, 14 x 20	9.25
Venux, IC, 14 x 20	5.60
Waldo Redipped, IC, 14 x 20	7.25
Westmoreland, IC, 14 x 20	6.25
Wilkinsburg Redipped, IC, 20 x 28	16.00
" " IX, 20 x 28	19.00
Willow, IC, 14 x 20	6.25

American Bright Plates—

Almond, IC, 14 x 20	$6.25
Brilliant (Tissue Packed), IC, 14x20	8.00
Climax, IC, 14 x 20	6.50
" IX, 14 x 20	8.00
Florence, IC, 14x20	6.75
Hazel, IC, 14x20	5.85
Linden, IC, 14x20	6.50
Merchant's Dipped, IC, 14x20	11.00
Merion, IC, 14x20	6.75
Mint, IC, 14x20	6.00
Palma Xtra, IC, 14x20	7.25
Phœnix, IC, 14x20	6.25
" IX, 14x20	7.75
Royal, Extra, IC, 14x20	7.00
U. S., IC, 14x20	7 25

Imported Terne Plates—

Charcoal.
Dean Grade.—IC, 14 x 20..... @$5.50
20 x 28..... @11.00
IX, 14 x 20..... @ 6.75
20 x 28..... @13.50
Abercarne Grade.—IC, 14 x 20..... @ 5.40
20 x 28..... @10.80
IX, 14 x 20...@ 6.62½
20 x 28..... @13.25

Imported Bright Plates—

Charcoal.
Duty: 2.2¢ ₩ ℔.

Melyn and Calland Grade.	IC, 10 x 14	@$6.50
" "	IC, 12 x 12	@ 6.75
" "	IC, 14 x 20	@ 6.50
" "	IC, 20 x 28	@18.00
" "	IX, 10 x 14	@ 8.50
" "	IX, 12 x 12	@ 8.75
" "	IX, 14 x 20	@ 8.50
" "	IX, 20 x 28	@17.00
" "	DC, 12½ x 17	@ 6.00
" "	DX, 12½ x 17	@ 8.00
Allaway Grade.	IC, 10 x 14	@ 6.00
" "	IC, 12 x 12	@ 6.25
" "	IC, 14 x 20	@ 6.00
" "	IC, 20 x 28	@12.00
" "	IX, 10 x 14	@ 7.50
" "	IX, 12 x 12	@ 7.75
" "	IX, 14 x 20	@ 7.50
" "	IX, 20 x 28	@15.00
"	DC, 12½ x 17	@ 5.50
" "	DX, 12½ x 17	@ 7.00

Coke.
Steel Coke.—IC, 10x14, 14x20..$5.40@$5.50
10x20..... @ 8.50
20x28..11.50@12.00
IX, 10x14, 14x20..... @ 6.75
B. V. Grade.—IC, 10x14, 14x20.... @ 5.50

Imported Boiler Plates.—

IXX, 14x26..(112 sheets)	@$13.85
IXX, 14x28..(112 sheets)	@ 14.50
IXX, 14x31..(112 sheets)	@ 16.00

Tinning—

Brass and Copper.....net

Tubing—

Tin..... 55%
Galvanized..... 55%

Brass and Copper.—

Standard List..... 35@40%

Troughs, Eave—See *Eave Troughs*

Trucks Stove—

Improved Lock Frame, per doz.... $15.00
Steel Lock Frame, per doz..... 18.00
Daisy Improved Pattern, ₩ doz.... 18.00

Zinc—

600 ℔ casks..... ₩ ℔ 5¾¢@6¢
Per ℔..... 6¼¢

News and Notes.

The competition of the new electric street railways in Brooklyn is being keenly felt by the elevated roads of that city. The decrease in recent traffic has necessitated a cut of 10 per cent. in the wages of all "L" road employees from October 1.

Insurance companies report an abnormal number of losses from the West during the past few weeks. One large agency, having a choice of Western business, finds Western losses exceed 60 per cent. of all.

The City of New Orleans has just sold for $700,000 cash down, to the New Orleans City & Lake Railroad Company a renewal from 1906 until 1956 of that company's extensive street railway franchises.

The new battle-ship "Indiana," which has been put into dry-dock at the League Island Navy Yard, Philadelphia, to receive her propellers, will, it is announced, be ready for her preliminary trial trip by the middle of October. The Government test of the triple-screw cruiser "Columbia," also built by the Cramps, will be made about November 1, when it is expected that she will exceed the speed attained on her preliminary trial.

Domestic coastwise trade, as recorded in the report of the New York Custom House for the year ended August 31, appears to be very satisfactorily growing in value. During the year under review the coastwise tonnage of the port of New York was 555,449 and the foreign tonnage was 1,011,176, valued at $109,145,615 and $107,120,344 respectively. In 1892 the tonnage of the coastwise trade of the port was 525,295 and the foreign 1,032,036, showing an increase in the former of 30,154 tons and a decrease in the latter of 120,860 tons.

Louisiana's rice crop will fall this year far below the average. A late estimate places it at less than 750,000 sacks, as against 2,000,000 sacks in 1892. The shrinkage is attributed to drouth. The farmers of the State talk of irrigation next year.

Great activity is reported from the United States torpedo station at New port, R. I., where a large number of important experiments are under way, including tests of a number of torpedo defense nets, the Ericsson submarine gun and the Cunningham and Edison-Sims torpedoes.

The building of oil-tank steamers has become an important branch of naval construction. There are at present 47 of these vessels afloat, varying in size from 666 to 4134 tons gross, while 17 more are building at European yards.

The price of raw sealskins has advanced 25 per cent. since the Behring Sea decision.

The German Imperial Government proposes instituting a state control of shipbuilding, a duty which has hitherto been performed by private associations. The competition among these associations tends, it is argued, to a lower standard of shipbuilding, a danger which might be avoided by Government supervision.

A tariff conference between Russia and Germany is to be held in Berlin next month, with a fair prospect of settlement of the present tariff war between these countries. It is said that Germany is ready to concede lower rates on Russian cereals in return for a reduction of the Russian duty on manufactures of iron and some other goods. Immense quantities of grain are piled up at Russian ports awaiting shipment.

The un-American proceeding of "persuasion by dynamite" was used by union sailors at San Francisco on Sunday against non-union men, of whom five were killed and a number injured by the explosion of a bomb thrown into their boarding house.

A bitter contest has been going on since August 3 between the elevator companies and the farmers in Minnesota, in consequence of the companies having applied for a permanent injunction on the erection of the State farmers elevator at Duluth, for which the Minnesota legislature have appropriated $120,000. On September 23, however, the application of the elevator companies was refused, and the farmers will now proceed to erect their own elevator.

The representatives of French workingmen sent to study the World's Fair reached Chicago in two divisions. One arrived on the 18th and the other on the 22d inst. They received a cordial welcome from prominent leaders of the Chicago trades unions, who are doing all they can to make the visit of their transatlantic friends pleasant. They are expected to sail from New York for France on the 30th.

LABOR EXCHANGE.

Notices under this heading of reasonable length are inserted free of charge. Only those relating to employment are admitted. Write distinctly on one side of paper only, and do not use postal cards.

HELP WANTED.

At once, first-class TINSMITH; good job. P. Monagham, South Amboy, N. J. Sept. 30

At once, a STEAM and HOT-WATER FITTER; one who is competent to take charge of jobs with a helper; state age, experience and wages. P. O. Box 80, Warren, Mass. Sept. 30

A first-class TINSMITH on tinware; one that can furnish some capital to manufacture and take part interest; write for particulars. H. W. Gazlay, 138 Groton avenue, Cortland, N. Y Sept. 30

A reliable, temperate TINSMITH, who understands roofing, general jobbing, inside and outside work, iron-pipe work, and has some knowledge of plumbing; write, stating wages expected and experience; a steady job for suitable man. J. W. Beard, Plainville, Conn. Sept. 30

At once, first-class MOLDER to take charge of brass foundry. P. O. Box 413, Trenton, N. J. Sept. 23

A good TINSMITH and GENERAL JOBBER, for all kinds of country work; steady job all year round. F. L. Frick, Manhasset, L. I. Sept. 23

Twenty-five CORNICE MAKERS; steady work; union wages. Bay State Metal Works, 49 Harvard street, Cambridge, Mass. Sept. 23

A good TINSMITH, one well up on furnace work and roofing. E. A. Perpall & Co., Flushing, N. Y. Sept. 23

METAL SPINNERS. John C. Jewett Mfg. Company, Buffalo, N. Y. Sept. 23

A first-class PLUMBER immediately; will agree to give a steady job to the right man. Apply with reference to Daniel F. Kelly, 76 Crown street, New Haven, Conn. Sept. 16

A man who understands CORNICE WORK and TINNING; to a competent man will give steady work the year round; state wages wanted and experience. E. H. Friedrich, Holyoke, Mass. Sept. 16

At once, a first-class TINSMITH, ROOFER and GENERAL JOBBER; one that can do plumbing and wipe a joint preferred; must be sober and steady; none but first-class man need apply; state wages and give references. P. E. Fraleigh, Red Hook, N. Y. Sept. 16

A first-class ROOFER and CORNICE MAKER; each to be competent in his own line. J. H. B Hoffmann, 38 Green street, Albany, N. Y. Sept. 16

SITUATIONS WANTED.

A young married man, 26 years of age, in the hardware, stove and tinware business, wholesale and retail, wishes to better his position; is also conversant with the details of bookkeeping; best of references. Joseph Birbeck, Post Office box 157, Freeland, Pa. Sept. 30

As BOOKKEEPER; has had experience in wholesale and retail plumbers' and mill supplies; can give reference. F. H. Carter, 275 South Factory street, Springfield, Ohio. Sept. 30

Cornice cutter of 12 years' experience desires a position as CUTTER or FOREMAN by October 15; thoroughly understands the business in all its branches; the West preferred; can furnish the best of references. "A. B. C.," office of *The Metal Worker*, 59 Dearborn street, Chicago, Ill. Sept. 30

An experienced hardware SALESMAN wishes a position with some good firm, either in store or on the road; capable of taking full charge of a store; can give best of references. Box 53, Middletown, Ohio. Sept. 30

By a thoroughly first-class PLUMBER, a steady position in or near New York; 15 years' experience; can take charge and do a little tin work if necessary; state wages. "A. W.," care Mitchell Bros., 438 Grove street, Jersey City, N. J. Sept. 30

As TINNER on furnace and job work. "Tinner," P. O. Box 169, Cochranton, Pa. Sept. 30

By a young TINSMITH, 24 years old; competent to do any work in this branch. L. Kreurmann, 199 Forsyth street, New York City. Sept. 30

By a japanner, as FOREMAN with a first-class house in the West; understands all the branches of the business and can instruct boys and girls. "Japanner," office of *The Metal Worker*, 96-102 Reade street, New York City. Sept. 30

By a young man, as TINSMITH: 18 years' old; three months in this country. Mr. Schapiro, 217 Madison street, New York City. Sept. 30

Experienced STEAM FITTER, well acquainted with the latest system of burning oil under boilers and heaters. C. F. Pluemacher, 455 Ninth avenue, New York City. Sept. 30

WOOD PATTERN MAKER and CARVER in stove works; competent to make drawings, both ornamental and mechanical. J. Thomas, 10 Broadway, two flights, front, Troy, N. Y. Sept. 30

By a PLUMBER who thoroughly understands plumbing and gas fitting, also has some knowledge of steam fitting; steady position desired for the fall and winter in some Southern town or city; has worked in city and country; temperate. F. J. Wolfel, care B. D Lum & Son, Stamford, Conn. Sept. 30

As SUPERINTENDENT or FOREMAN, by man skilled as such; 12 years' experience in designing drill jig and fixtures for small parts in any line; also have had the management of pattern shop in wood and metal, machinery, architectural, boiler, electrical, sewing machines and follow board and snap flask work in all branches; am capable of filling a position in any mechanical line; 35 years old, 11 years foreman near New York City; have splendid references. R. Mudd, 1759 South Eighteenth street, St. Louis, Mo. Sept. 30

By a first-class stove mounter and pattern fitter, position as FOREMAN of mounting or pattern-fitting rooms; ten years' experience in the above position; very best of references. "Western," office of *The Metal Worker*, 96-102 Reade street, New York City. Sept. 30

Good all-round TINNER; steady job the year round; strictly sober and reliable. "G. E.," Box 55, Bethel, Conn. Sept 30

Having closed up my stove, furnace and tinware manufacturing business, would like a position as HOME or TRAVELING SALESMAN for either the above or kindred lines; can furnish abundant evidence of integrity and ability, and willing to contract with a reputable firm on commission basis if expenses are paid. "J. B. L.," office of *The Metal Worker*, 96-102 Reade street, New York City. Sept. 30

By a TINNER of six years' experience at furnace work, roofing, spouting and jobbing; am strictly temperate and reliable; steady job wanted in town or country; state wages. "A. B.," Box 83, Woodstock, Ontario. Sept. 30

TINSMITH, in and outside worker, wants a steady job; city or country. Littman, 1575 Avenue A, New York City. Sept. 30

TINSMITH, general jobber, desires a good job; city or country. I. Loene, care Mr. Sideman, 505 East Eighty-seventh street, New York City. Sept. 30

By a practical cornice and skylight maker, first-class cutter and draftsman; 12 years' experience; competent to have charge of shop and men; thoroughly understands the business inside and outside; desires position as FOREMAN or CUTTER. "Practical," Box 930, office of *The Metal Worker*, 96-102 Reade street, New York City. Sept. 30

By a TINSMITH and ROOFER. Herman Landesbery, 292 Delancy street, New York City. Sept. 30

By an A1 pattern fitter and stove mounter, as FOREMAN or to work at the bench; position desired by January 1, 1894. Frederick Kent, 1188 Congress street, Detroit, Mich. Sept. 30

By a first-class TINSMITH; ten years' experience; city or country; single. J. Kleinberger, care of Harry Black, 162 West Twenty-fifth street, New York City. Sept. 30

By a PLUMBER who is also a good gas and hot-water fitter; sober, steady and reliable; city or country. "Plumber," 18 Centre street, Yonkers, N. Y. Sept. 30

By a single man 24 years old, with seven years' experience at tin and iron work, in and outside; state wages for a steady job. W. G. Cook, 731 West Cedar street, Akron, Ohio. Sept. 30

As FOREMAN in an iron foundry, by a practical molder; understands the handling of men and all the duties connected with iron and foundry business; can furnish good reference. "W. T. C.," 113 Hewes street, Brooklyn, E. D., N. Y. Sept. 23

STEAM and GAS FITTER wishes employment in country; 26 years. Geo. P. Farrell, 322 West Seventeenth street, New York. Sept. 23

By a a PRACTICAL MECHANIC, CUTTER and FOREMAN; 27 years' experience at the tin, copper, sheet iron, galvanized iron, cornice and slating work; thorough draftsman; can estimate on work; speak English and German; state wages. J. Hase, St. Louis, Mo. Sept. 23

In good general hardware store as SALESMAN and BOOKKEEPER; or to exchange a fine improved 400 acre farm, lightly encumbered, for $6000 stock general hardware; farm in East Nebraska. C. W. Crum, Norfolk, Neb. Sept. 23

As PLUMBER, by Edmund Walsh, 304 East Fifty-ninth street, New York. Sept. 23

By a first-class MACHINIST and LATHE HAND; city or country. P. Klein, care of Roth, 228 East Second street, New York. Sept. 23

By a first-class MACHINIST and LATHE HAND, city or country. L. Fried, 341 East Houston street, New York. Sept. 23

FOUNDRY SUPERINTENDENT open for engagement after October 1; first-class manager; competent to take entire charge of any works; thorough knowledge of every branch of range, furnace, steam and hot-water business; ten years in charge of extensive works; highest references. "Superintendent," Box 923, office of *The Metal Worker*, 96-102 Reade street, New York City. Sept. 23

By a young man, 23 years of age, place in PLUMBING and TIN SHOP; four years' experience; also some knowledge of steam and gas fitting. "S. C.," Box 23, Westport, N. Y. Sept. 23

By a MACHINIST; can work at machine repairing; German. Philip Shepherd, 201 Second street, Elizabeth, N. J. Sept. 23

By a TIN and SHEET-IRON WORKER, PLUMBER and GENERAL JOBBER; can do all kinds of inside and outside work. J. Nangle, 14 Boylston place, Boston, Mass. Sept. 23

BY PLUMBER, GAS FITTER and experienced jobber. H. Vehstedt, 245 East 114th street, New York. Sept. 23

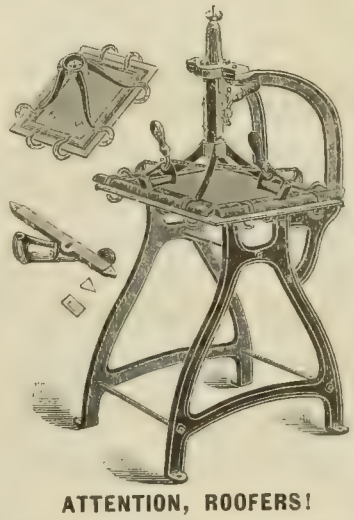
By a first-class TINSMITH, proficient in all branches of the trade; strictly sober and trustworthy. La Seur, 552 Broome street, New York City. Sept. 23

As INSPECTOR or FOREMAN of mounting shop; 20 years' experience in large stove works; first-class references. "Inspector," office of *The Metal Worker*, 96-102 Reade street, New York City. Sept. 23

As TINNER or CLERK; three years' experience; can make tinware and do roofing and spouting; best of habits and reference; good job desired; wages no object. "Jack the Tinner," Nappanee, Ind. Sept. 23

Young man, age 23, with good reference, worked at the tin, sheet-iron, stove and furnace business for four years, would like to get a steady job in the Eastern or Middle States; salary very reasonable to begin with if there is any chance for improvement. F. G. Shadigg, Prescott, Wis. Sept. 23

HASTINGS' Quadruple Roofing Folder.



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A well equipped stove foundry, located in the iron region of the South; has been in operation ten years; the buildings and machinery are new, having been erected on a new site recently, the patterns are of good salable stoves; it is located on three trunk lines and a navigable river and in one of the largest cities of the South; the present owners will agree to take half of the output; terms, one third cash and balance can be paid in product of the foundry in two or three years. Owners have other interests which engage their attention. For further information address

"STOVEMAN,"

care of JAMES J. SMITH & CO., 119 Dearborn St., Chicago, Ill.

FOR SALE.

Having purchased the patterns, tools and the business of the Hotel Car Range Co., we have a complete set of tinners and sheet iron tools and such as required for a range shop. Both hand and power bending machines, power drills, &c. Will sell cheap, apply

BRAMHALL, DEANE & CO.,
79, 81 & 83 Market St., Chicago, Ill.

FOR SALE.

An old-established stove and tin business with stock and tools. Only small capital required. Poor health reason for selling.

A. F. MOSELEY, Federalsburg, Md.

A RARE INVESTMENT.

Old-established stamped and japanned ware factory for sale at a great sacrifice. For particulars address.

"STAMPING,"

office of *The Metal Worker*, 96-102 Reade St., New York.

FOR SALE.

Tin and hardware store in a growing town. For reasons address

J. G. NESENSON,
Lock Box 175, Grand Valley, Warren Co., Pa.

WANTED.

To buy, in some city of not less than 25,000 inhabitants in either New York or Pennsylvania, a stove, tin and plumbing business. Address

"MECHANIC,"

office of *The Metal Worker*, 96-102 Reade street, New York.

PLUMBING BUSINESS.

Wanted to purchase, an established Plumbing and Heating business in a city of not less than 30,000, or will buy interest in profitably established business. Address, with full particulars,

"BUYER,"

office of *The Metal Worker*, 59 Dearborn street, Chicago.

BUSINESS OPPORTUNITY.

FOR SALE.—A Plumbing, Tinning, Steam and Hot-Water Heating business, in connection with crockery, stove and tinware store. Located in one of the most enterprising towns in New England. Plenty of business will be sold low if sold soon. Address

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office of *The Metal Worker*, 96-102 Reade street, New York.

A Set of Tinners' Tools

For Sale cheap. For any information write or inquire of C. H. ANDREWS,
Box 398, Athol Center, Mass.

FOR SALE.

As I wish to retire from business, I offer my stock of Hardware and Stoves of about $10,000 for sale. A splendid paying business; will stand the very closest investigation, and a chance of a lifetime. Situated in a lively town in Wisconsin. Don't answer this unless you mean business. Address "BUSINESS,"

office of *The Metal Worker*, 59 Dearborn street, Chicago.

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YOUNG MAN DO YOU WISH TO LEARN A GOOD TRADE?

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Will commence on Jan. 2, 1894.

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The New York Trade School has attained a high reputation and is largely attended each year, the young men coming from all parts of the United States and Canada. Excellent lodging accommodations are provided near the school for pupils desiring them.

Catalogue, illustrated with 30 photo engravings, mailed free on application. Address

NEW YORK TRADE SCHOOL,
1st AVE., 67th and 68th STREETS,
NEW YORK.

FOR SALE.

All or part interest in a specialty business established ten years in Philadelphia; centrally located, doing a good trade, with good profits. Any person with a knowledge of the tin and sheet-metal trade would be adapted for the business. Reason for selling, other interests require present owner's attention. Address

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office of *The Metal Worker*, 220 South 4th street, Philadelphia.

Partner Wanted.

A member of a large wholesale house with superior connections and well-established trade among stove dealers and kindred branches desires a partner, silent or active. Particulars furnished to parties who send full name and address. Apply

"STOVES,"
P. O. Box 1086, Philadelphia.

FOR SALE.

To Close an Estate.

An old (11 years) established plumbing business, with stock and tools, in a live Western City having water, sewer and gas systems. A rare chance for a practical man. Address

"F. R.,"

office of *The Metal Worker*, 59 Dearborn St., Chicago.

Heating Boiler Patterns
FOR SALE.

Patterns of a new cast iron return flue boiler for steam or hot water. Cheap construction. Also services of inventor, who is an experienced and capable engineer and manager of sales department. Address

"DESIGNER," No. 916,

office of *The Metal Worker*, 96-102 Reade St., New York.

FOR SALE.
STOCK OF HARDWARE AND TINNERS' TOOLS.

New and in good shape, will invoice about $3500; in a good town of Eastern Iowa; good farm land surrounding and A No. 1 trade; do not wish to trade; must sell, as other business interests demand my attention. For particulars address "IOWA," office of *The Metal Worker*, 59 Dearborn St., Chicago, Ill.

Special Notices.

!!! FOR SALE !!!

BAKER BLOWERS, Nos. 1, 4½, 5, 6 and 7.
ROOT BLOWERS, Nos. 1, 2, 3, 4, 5, 6 and 7.
Sturtevant Blowers, Nos. 4, 5, 6, &c.
1 Corliss Band Wheel, 12 ft. x 24 in., in halves.
A variety of Machinery, such as Boilers, Engines, Pumps, Crushers, &c., very cheap.
Do you want to buy or sell Machinery? If so, write

C. R. BIGELOW, Machinery Expert,
45 Dey St., New York City

FOR SALE.

A valuable Stove Plant, comprising stoves, ranges and heating stoves, wood and iron patterns, flasks and fallow boards, carrying with it a large repair trade, sufficient to pay for plant in short time. Address

"INVESTMENT,"

office of *The Metal Worker*, 96-102 Reade St. New York.

WANTED

To buy cold rolled scrap steel, 4 ft. long, 3 to 5 inches wide, No. 16 or 18 gauge, or oblong pieces 12 x 16.

PULLMAN SASH BALANCE CO.,
Rochester, N. Y.

FOR SALE.

An old established Stove and Tin business, with stock and tools, at Thomaston, Conn. Only small capital necessary. A rare chance for a practical man. Good reason for selling. Address E. A. BRADLEY, Waterbury, Conn.

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The Flanders process for tinning cast iron is now an assured success and is in use by some of the largest firms in the country. Correspondence solicited for the erection of galvanizing or tinning plants. Mr. W. T. Flanders will continue to superintend the building and starting of all plants.

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BENZINE OR WATER
Paste Stove Polish at 4 to 6 Cts. per Pound.
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THE METAL WORKER.

NEW YORK AND CHICAGO.

Saturday, October 7, 1893.

DAVID WILLIAMS, - PUBLISHER

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A New Gas-Making Process.

It is stated that a new process has been invented for manufacturing illuminating gas from wood, in regions where wood is abundant and coal is dear. If this be true, and if, as is further alleged, the process is cheap and applicable to the economical production of gas in small quantities for isolated dwellings and other uses, the invention has a chance for an extended application, with consequent increased demand for gas fixtures, gas fittings and gas fitters' work. The possibilities of wood as a material for the manufacture of gas have frequently attracted the attention of chemists, and some processes for utilization of sawdust and shop refuse from wood working establishments for this purpose have been devised. So far no remarkable progress has been made in this direction, but in these days of startling innovations it will not do to judge of the future of any line of invention by the past, unless the great surprises of the past are taken to indicate equally great possibilities in the future.

Economy of Fuel.

In these hard times economy is enforced along the entire line of business and household expenses. As very often managed, there are few articles of household consumption used more wastefully than fuel. In an investigation made some time ago to ascertain how much waste there might be under quite average conditions of furnace consumption, the ashes, &c., were saved that were discharged from two large furnaces in a school, to which, from the commencement of heating in the fall till its discontinuance in the spring, were fed 36 tons of good anthracite coal. Two men were employed to sift these ashes and sort out the clinkers and stones. Their wages were $1 each per day, and they did the job thoroughly in somewhat less than three days, receiving $5 for the work. The good coal removed from the ashes was then weighed and found to be 2½ tons. The cost of the coal delivered was $6.50 per ton. Hence, a little over 6 per cent. of the coal was saved, the value of which was $13 20, obtained at a cost of $5, a saving of $7.20 in the cost of the year's fuel. The weighing occupied some of the time of the men, which would make the actual saving somewhat greater. It was thought that the furnaces were not more than ordinarily wasteful of coal, and that they were managed with average skill. A considerable economy is possible in all kinds of heating apparatus by careful management in the supply of fuel as needed. Coal should be placed on the grates of heating boilers in sufficient quantity at each feeding to last a considerable time without further attention. It is a great mistake to keep fussing and puttering with a fire, and, by too frequent shaking of the grate and poking the fuel, to work through the grate an undue amount of unburned coal. The shaking and clearing out should be done thoroughly after a mass of ashes has accumulated under the burning coal; then, when the supply of new fuel is added, the fire should be allowed to take its own course, provided the draft is regulated automatically, as ought always to be the case when practicable.

Concerning Business.

It is not an easy matter just now to analyze the condition of trade with any confidence in the analysis. Every one remembers very unpleasantly the financial stringency of the late summer and the immediate effect it had on business. Since the meeting of Congress the money market has become easier, and trade has started up again in some measure. In just what measure, however, it is hard to tell. The daily papers are flooded with reports respecting the commercial and industrial situation. One set, with a view to proving that the silver law is the root of all business evil, read the commercial barometer by the light of the debates at Washington, and as unconditional repeal approaches the prospect brightens, and as prolonged delays make uncertain this repeal the prospect darkens again. The other set of newsgatherers base their opinions on the treatment of the tariff. Any indication that the tariff will be interfered with and duties revised is the occasion of a melancholy survey of the business condition, while the reassurance from Washington that Tariff matters are to remain untouched is the inspiration of a bright prophecy for business. And so it is that just at present ordinary sources of information respecting industrial conditions are more than usually unreliable.

Present Activity

Leaving out altogether these varying rumors, and basing conclusions on what has come under nearer observation, it is worthy of note that in many lines of trade there has been, and is, a good degree of activity. This, to be sure, is the busy season in heating lines, but many houses report an unusually large number of orders and good business. This might be explained by the delays in purchasing earlier in the year, but in the cases in mind the amount of business is figured since January 1, and shows that the year throughout has been by no means unsatisfactory. With respect, therefore, to the present condition in industrial circles, there is much to be found of a gratifying nature. The future is less reassuring. The household trades, if we may so class a large number of diverse industries that depend upon the building trade for their activity, are not over sanguine. Houses are being built and finished, of course, but the future work is of small proportions. It is the fear of light business next year, rather than regret for the small trade of the present, that is causing worry, which worry, it is to be hoped, will be proved foolish by events.

California Midwinter International Exposition.

The Department of Publicity and Promotion of the California Midwinter International Exposition issue, from the California State Building, World's Fair, Chicago, a circular letter in regard to the exposition to be opened in San Francisco, Cal., on January 1, and to which we referred last week. The directors of the California enterprise believe that its success is assured, and that there is no doubt of a large attendance of visitors from foreign countries and the American States other than those bordering on the Pacific Coast, judging from the interest taken by World's Fair visitors in the proposed undertaking. The railroad companies have promised to make a one-fare rate for the round trip, thus bringing the cost of a visit to the Golden Gate within reasonable reach of many who could not otherwise hope to get so far afield. In reference to the plan and scope of the exhibition, the managers observe that although the California Fair will not be as great in size as the Columbian Exposition it will be thoroughly international in character, and will show all that is best in the art,

science and industry of the world. Some of the best and most interesting exhibits in each department of the World's Fair will be removod from Chicago to San Francisco at its termination, in addition to which many novel and original displays will be made. A Midway Plaisance is to be as prominent a feature of the fair as that of Chicago, and many of the best displays from that place will go on to San Francisco, while a number of novelties are to be introduced. Foreign countries have been invited to co-operate through their commissioners, and we understand are entering heartily into the scheme.

Chicago's Unemployed.

Under the direction of the Mayor of Chicago an effort has just been made by the police of that city to ascertain how many persons are unemployed They visited 2187 establishments and found an aggregate of 111,016 persons employed, as compared with 186,602 ordinarily employed. The difference between these two aggregates is 75,486, and this is assumed to represent the unemployed, although claims are made by those who profess to be thoroughly informed on the subject that many establishments were not visited and that the number out of work is nearer 100,000. This is an appalling fact confronting the city authorities on the eve of winter. Cincinnati is in very much better shape than Chicago. A police canvass there shows but 4500 unemployed, and a liberal allowance for errors and omissions does not make the number over 6000. Citizens of St. Louis, however, claim that their city is in the best position of any of the Western trade centers, having no more unemployed than will always be the case in the best of times.

World's Fair Prize Winners' Exposition.

An Eastern sequel to the Chicago World's Fair is announced to be held this winter in New York. The form of the display is to be a World's Fair Prize Winners' Exposition, under which title it is to be opened on or about November 24, 1893, at the Grand Central Palace, closing on January 15, 1894. The idea is, we presume, to confine the exhibits to those which have actually gained prizes in Chicago. The original idea was to hold the exhibition in the months of February and March, but owing to the determination of the Columbian Commissioners to close the World's Fair on October 31, and at the solicitation of foreign exhibitors, who propose exhibiting in New York, the earlier date for opening was decided upon. The idea is a good one, as such a selection of meritorious exhibits will not fail to attract and interest many persons whose circumstances have not admitted of a visit to the White City. The exposition is under the management of the Manhattan Industrial Exposition Company, to whose office, at 122 West Twenty-third street, all applications for space should be sent.

A New Enamel.

Nobody is surprised, says the *Architect and Contract Reporter* of London, when they hear of a new application of science by Fletcher, Russell & Co., Limited, for already they have gained a reputation for their specialties that is world wide. Their latest production is more than useful; it will be an auxiliary to industrial art, and the advantages of it are not easily limited. The new Chimatto enamel is unlike the majority of enamels in the market, as it can readily be applied to iron, and produces a "matt" or dead surface of the sort that is more easily desired than obtained. So far as is known, it becomes as enduring as the metal to which it is applied; and it has, moreover, the advantage that it cannot be chipped. It can be produced in all colors and the most delicate tints, either dead or bright; gold and silver, either dull or polished, can also be applied to the same casting. They are equally unchangeable either when exposed to the air or to any heat up to a bright red. The film of enamel is, however, so thin that the most microscopic details on the metal are unchanged in form and character. The application is new and admits of a large extension for permanent decorative work of all kinds. Castings protected by the enamel are not only capable of fine artistic treatment, but they are absolutely permanent and proof against dirt and smoke, which disfigure other work so rapidly. Messrs. Fletcher, Russell & Co., Limited, have set up a special plant and buildings on a large scale specially for this new branch of their already extensive and varied business. Specimens of the enamel will shortly be exhibited in their showrooms in London, Manchester and Warrington. From what we have seen we have no doubt the new enamel will be at once accepted as indispensable.

Jim and the Fire Pot

Jim had for a long time wished that the boss would buy a gasoline fire pot, as the old charcoal arrangement was rather inconvenient to manage. When a job was to be done in a house it was necessary to either leave the fire pot out of doors until the "smoke" had burned out of the coal, or else fill the house full of fumes that would remind one of the time when a prairie fire had passed through a barnyard. Jim had been caused much trouble by the use of the charcoal fire pot. Once he was proceeding up stairs in a house for the purpose of making some repairs to a tin roof. He had hardly reached the roof when there was a cry of fire from below. A hurried retreat was made by Jim, when it was found that a piece of "live" coal had fallen out of the fire pot and started an incipient conflagration by coming in contact with the hall carpet. It was an easy matter to extinguish the fire, but the same could not be said regarding the hole burned in the carpet.

Then there were legal complications regarding who was responsible for the damage sustained by the carpet. It was easy to convict the fire pot of incendiarism in the first degree, but that would do little good, as the fire pot was without a bank account. Jim did not consider himself to blame, as he was simply using such materials or implements as his boss furnished. The boss did not care to purchase a new carpet for another man's house when it was Jim, in combination with the old fire pot, that had caused the trouble. It is curious to note what a complicated legal controversy can be kindled by one small piece of charcoal.

On another occasion Jim was climbing up a ladder inside of a new building, holding the fire pot with his left hand in the usual manner. When he started the fire was burning innocently enough, but before reaching the ladder top the fire was burning with great vigor, after the manner of fire pots under similar circumstances. If Jim dropped the fire pot, as he felt inclined to do, the attraction of gravitation would cause it to fall, and coming in contact with various boards and shavings below would probably cause the fire to be scattered and burn up the building. Accordingly Jim made great haste to reach the summit of the ladder, but notwithstanding the haste, his hand was broiled to such an extent that labor was out of the question for a number of days. In this instance there were many who lavished praise on Jim for his bravery and fortitude, but there were none to pay him for his lost time or ointments. It is not surprising that Jim desired a fire pot that would behave in an orderly manner. Accordingly a gasoline fire pot was ordered and duly received.

One day Mr. B. drove up to the shop to get some one to repair a lead pipe connected with the kitchen pump. This was a job for Jim, and accordingly the new fire pot was taken along. Arriving at the pump's residence, Jim proceeded to inflate the fire pot and ignite the vapor. For some time there was a great blowing and roaring, as the fire pot's lungs appeared to be out of order. This part of the performance being over, it was not long before Jim had his coppers hot and the pipe soldered. As they were driving back to the shop Mr. B. inquired regarding the price of such a heating machine, and where one could be procured. Upon receiving the desired information, Mr. B. expressed a desire to purchase one. As Jim did not clearly perceive any particular reason for the purchase, Mr. B. stated that his wife was a great scold, and when she once got started it was difficult to stop her. Accordingly, when she got on the rampage it would be only necessary to start up the gasoline fire pot, which would make about as much noise as Niagara, thus effectually covering, overcoming or obliterating the conversation of Mrs. B. Mr. B. considered a "blower" fire pot to be invaluable in every family where there was a "blower" woman. TIN CHIPS.

Ordinary boiled linseed oil is stated in the *Engineering Magazine* to be the best varnish known for cast iron surfaces. Of course the metal will not absorb the fluid as wood does; so the whole of the gums contained in the oil remain on the surface, where it is hardened by evaporation. It may also be a fact that there is some union between the metal or some of its impurities and the oil, for certainly it dries very soon and very hard. Few persons know how rich a surface a casting can have until they have experimented with it. A casting with a good surface pickled and washed with warm water or steam will be a rich brown. One pickled and not washed will be a peculiar gray, and one pickled and washed with cold water will be a brilliant red. Care must be had to not file or chip such castings more than necessary and to never attempt to improve the surfaces left by the sand, as that surface cannot be improved in artistic appearance by filing.

By the fall of a roof in the Dolcoath tin mine, near Camborne, Cornwall, on September 20, eight miners were buried under a mass of soil or entombed alive.

ROOFING AND CORNICE.

Roof and Sidewalk Light.

The illustration herewith shows a new glass light for roofs, floors, partitions, skylights and sidewalks, patented September 12, 1893, and made by J. C. French & Son, 452 Canal street, New York. In construction it consists of a wrought iron border and $\frac{7}{16}$-inch steel rods running crosswise and riveted at the ends after the glass has been placed. The glass eyes, which are ornamental, are 4 inches square, with grooves along their sides to fit the steel rods. After they are in place and the rods riveted to the frame, a cement is used te fill in the spaces. When finished one of these lights presents but little more obstruction to the entrance of light than the rods alone would present. In appearance the rods and cement seem a fragile support for the sheet of glass, but a test of 500 pounds per square foot shows that the necessary strength is provided. A smaller size round bulls-eye is used when desired, but the strength and the greater amount of light given by the larger square glass eye have made it the favorite. The glass eyes are of the white transparent kind, ornamented to secure privacy and at the same time let the light through freely.

Roof and Sidewalk Light.

Skylight Competition.

Henry M. Sanders of Washington, D. C., whose essay was awarded the first prize in *The Metal Worker* Skylight Competition, sends us the following corrections respecting the essay as published in *The Metal Worker* of September 23:

1. On the first page and first column of the essay, third line from the top, it reads, "As in the construction," &c. It should read, "In the construction," &c., omitting "As."

2. In my description of Fig. 2, Plate IV, on page five of the essay, second line of first paragraph, there is a discrepancy between my description and the number referred to on the plate. You will note the essay says, "In Fig. 4 draw the line E F at right angles with A 6 in Fig. 2." But in referring to the plate I find Fig. 4 in the pattern developed from Fig. 1 instead of the pattern developed from Fig. 2, as my description would infer. The correction I would suggest under the circumstances, since Fig. 4 cuts no figure in either description, would be to leave it out altogether and simply say, "Draw the line E F," &c., as it in no way affects the clearness of the description.

3. In my description of Plate V, fifth page, second line of second paragraph, I say: "As shown by K L in Fig. 1." Referring to Plate V, I find K on one line and L on the line above. They should both be on the same line.

4. On the sixth page, first column, eighth line down in third paragraph, referring to Plate VI, I say: "Dotted lines drawn from the miter *c* L *e* in Fig. 1." It should read, "*c* L" instead of "*c* L *e*."

5. In the description of Plate VIII, fifth line from top of first column on seventh page, I speak of "dotted line drawn," &c., but the dotted line does not appear on the plate.

Further down in this description on the second line above Plate X instead of reading "as *e a*," &c., it should read "as *b a*," &c.

6. Plate IX is designated as "The miter for the E mold." It should read "E bar," and so in all cases where the word "mold" appears in the description it should read "bar."

7. In my description of Plate IX, first line of third paragraph, I say: "At point *k* on line *i g* in Fig. 2 draw *k* L at right angles with it." Referring to the plate no such line appears.

FLASHINGS.

Hastings & Wolcott, New York Mills, Oneida County, N. Y., are having many inquiries concerning their quadruple roofing folder, which was described lately in our columns. They are also making some sales and have prospects of a large demand for the folder as soon as it becomes generally known. The machine is adapted for two locks for standing seam, as well as four locks for flat seam roofing.

J. Foerster & Son, 806 East Fifth street, New York, have recently completed the hip skylight work with glazed side sashes operated from below on the Ville Marie Convent, Lexington avenue and Seventy-ninth street, New York. They are also working on the galvanized iron cornices for the building 300 Tenth avenue and the cold rolled copper dormers, finials, crestings and cornices, including the tin and slate roofing, for a building in East Eighty-fourth street.

Labor in South Africa.

The editor of the Johannesburg *Sentinel*, in the Transvaal, publishes the following abstract of the condition of the labor market in that region, which gives anything but encouragement to those contemplating emigration to South Africa:

"Carpenters, no demand; masons, bricklayers and plasterers, no demand; fitters, overstocked; engine drivers, badly overstocked; blacksmiths, no demand; miners, overstocked; house decorators, painters, &c., badly overstocked; printers, badly overstocked; wagon builders, &c., overstocked; tailors, overstocked (owing to colored tailors); bakers, overstocked; shop assistants, badly overstocked; clerks, terrible; dressmakers, overstocked; teachers, poorly paid; good white domestic servants, plenty of room; waiters, overstocked; cab drivers, mostly colored."

The scale of wages, although much above the ruling rates in Europe and America, are, however, counterbalanced by the excessive cost of living. The rent of a three-room cottage is given as from $35 to $40 a month, and good table board at $8 to $10 a week. All food articles, except beef and mutton, cost three or four times their value in England, clothing more than twice as much, and other necessaries of life in proportion.

The ornamental in coal carrying buckets or hods has not been supplied to any notable extent. There is nothing inviting in the average coal hod, but there is no reason why it should continue so ugly that haste is made to get it out of sight as soon as the fire has been replenished. The English have, as a rule, a less objectionable fuel receptacle, and there is good reason for a more attractive arrangement to be designed to perform the functions of the old-fashioned scuttle.

A proposal of the New York Dock Board to utilize the water front of Riverside Park for docks, wharves and elevators was defeated in a meeting called last Saturday to consider the plan.

At the universal exhibition, previously mentioned, to be held in Madrid, Spain, from April 1 to October 31, 1895, the exhibits will not be divided into nationalities, all goods of the same class being shown side by side. The charges for space will vary from $14.50 per square meter (10¾ square feet) to $10. Special positions will be on a higher scale.

THE LETTER BOX.

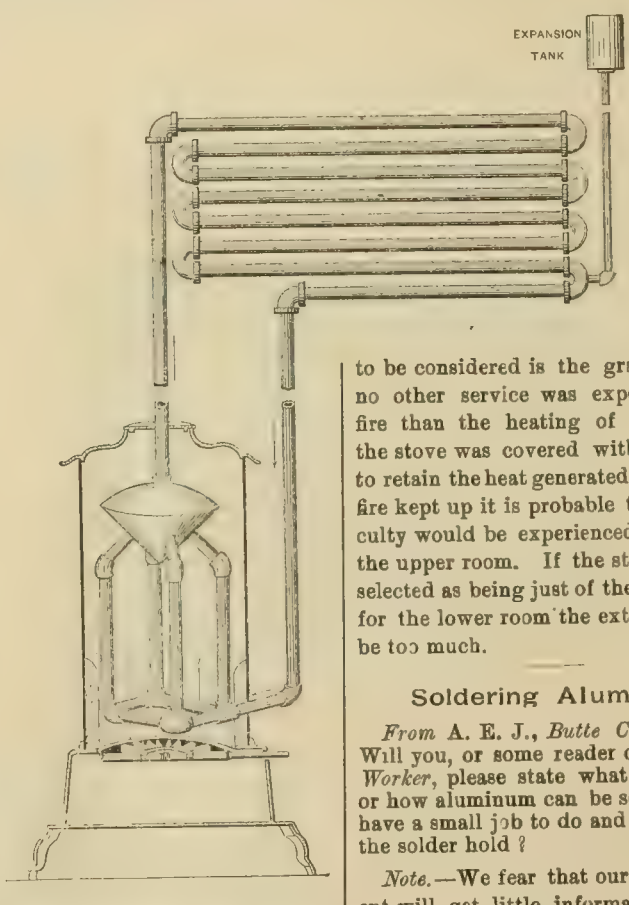
Trouble With a Pump.

From A. C. R., *North Berwick, Maine.*—I would like to ask through *The Metal Worker* what is the matter with an ordinary No. 1 pitcher pump that is connected with 1¼-inch pipe to lift water 22 feet. It will raise half a pail of water, then fail to bring a steady stream, only a little water coming at each stroke until a considerable time has been spent in pumping, when it seems to work well. If it is left for five minutes the same trouble is again experienced, yet I have failed to hear any water running back or to find any leak.

Note.—The action described is the usual result of an air leak that is very small and consequently hard to find. A good plan to follow is to carefully re-leather both the upper and lower valves. See that the upper valve fits the pump barrel tight to take up any wear that may have been made by long service. If this fails to overcome the trouble, the defect that causes it may be found to be a sand hole in the pump casting or a split in the pipe or some fitting.

An Apprentice's Water Heater.

From C. M., *Freston, Md.*—I am an apprentice and wish to surprise my em ployers, but need a little assistance and apply to *The Metal Worker* for informa tion. I have a room on a third floor that I want to heat for a workshop. How many feet of 1¼-inch pipe made into a wall coil would be required to heat by hot water radiation a 20 x 26 x 10 feet room. Also give rule for other sizes of pipe. I want to heat this room from a 13-inch cylinder stove by having four 1¼-inch pipes run down as far as the grate and connect as shown in the illustration and to be connected up above the fire by a hot water dome 10 inches in diameter and 6 inches deep. The stove is shown with the water heater in it, and the radiator and expansion tank.



An Apprentice's Water Heater.

Answer.—To decide correctly the amount of surface necessary to heat a room is not possible without the fullest details as to the character of the building, its exposure, glass surface, &c. Even then the rules require much judgment in their application. Without detailed information the rule of heating from 30 to 50 cubic feet of space with each square foot of heating surface seems to be the only way in this case to approximate the surface. Our correspondent must use his judgment in determining whether the room will be difficult or not to heat. In order to give an answer, 1 square foot of radiating surface will be decided necessary for 40 cubic feet of space, and as the room in question contains 5200 cubic feet it will require 130 square feet of heating surface. The distance the water has to travel will cause it to lose so much heat in transit that it is possible that the water in the coil would not be at a temperature that would enable this amount of surface to prove satisfactory. This contingency must be considered in apportioning the surface and more given if it is deemed necessary. There are 144 square inches in one square foot and the circumference of 1¼-inch pipe is nearly 6 inches. By dividing 144 inches by 6 inches it is found that a piece of 1¼-inch pipe 24 inches or 2 feet long exposes 1 square foot of surface, and by multiplying the 130 feet of surface by 2 the number of lineal feet of pipe necessary to make this coil will be found to be 260. The number of square feet of heating surface that 1 square foot of fire surface in a coil will heat varies from 20 to 30 or more feet with different authorities. Using 25 for an example and allowing for some cooling in the flow and return pipes, there should be 6 square feet of surface in the heating coil. If a coil was used 12 lineal feet of 1¼-inch pipe would be required. A general impression prevails that a coil should be cone shaped and should not come in contact with the coals for durability and highest efficiency, but should be suspended just above them, subject to their radiant heat and the full play of the flame and hot gases. The device of our ambitious young friend is open to some criticism owing to its being partly in the fire and it is just possible that it will lack the necessary heating surface and power. Another important point to be considered is the grate area. If no other service was expected of the fire than the heating of the coil and the stove was covered with a material to retain the heat generated and a steady fire kept up it is probable that no difficulty would be experienced in heating the upper room. If the stove has been selected as being just of the right power for the lower room the extra work will be too much.

Soldering Aluminum.

From A. E. J., *Butte City, Mont.*—Will you, or some reader of *The Metal Worker*, please state what flux to use, or how aluminum can be soldered, as I have a small job to do and cannot make the solder hold?

Note.—We fear that our correspondent will get little information on this topic. A weak point in the working of aluminum at present is the difficulty experienced in soldering. One firm who have done a great deal of work in this line, and manufacture aluminum in various forms, complain of the difficulty of soldering securely. There seems to be little certainty as to whether the solders will hold or not, and in some instances the work has been given up entirely. In Richards' work on aluminum several pages are given to the process of soldering, one of the solders, as recommended by Colonel Frishmuth, for ordinary work being: tin 95 parts and bismuth 5 parts; or tin 97 parts and bismuth 3 parts. And he recommends for fluxes, in either case, either paraffine, stearine, vaseline, copaiva balsam or benzine. A new process, it is

reported, for soldering aluminum by means of chloride of silver, has been invented by O. Nicolai of Weisbaden, and C. Langenbach, Frankfort-on-the-Main, Germany. The chloride of silver, pulverized, molten, or in the form of thin sheets, is placed on the parts to be joined, and the parts are then soldered together by the application of a soldering lamp or blowpipe.

Heating Coil Outside of Fire Pot.

From ROYALLY, *New York.*—In *The Metal Worker* of September 16 I notice an inquiry from "J. R.," Chambersburg, Pa., about a heating coil in a furnace. Some years ago I did the fire-pot coil-winding act and have a record of the date of the performance, as I thought the combination a novelty. The coil and fire pot being large enough, the room not too large, &c., the room may be warmed in this way.

From G. W. M., *Indian Orchard, Mass.*—In your issue for September 16 "J. R.," Chambersburg, Pa., asked about the success of a coil outside a fire pot. I have tried it with the best results, heating two rooms on the north side of the house where, in certain kinds of weather, the hot air could not reach. The cold-air supply does not seem to affect the work of the coil.

Cleaning Foundry Windows.

From IRON FOUNDER, *Chicago.*—Kindly ask through the Letter Box if anybody knows a successful process for cleaning foundry windows.

Note.—This is an interesting question, and as the days grow shorter it will grow in interest. The accumulation on foundry windows which impairs their usefulness is due to the steam from wetting down the sand, the smoke arising from the vents when pouring off, and the dust made in shaking out. The deposit reduces the light, and is not easily removed. A smile has greeted the subject when introduced to some who look upon it as a joke, as foundry windows testify for themselves that they seldom are cleaned. That they might be cleaned with advantage will be conceded, and if our readers have methods of doing it, they would be read with interest by others.

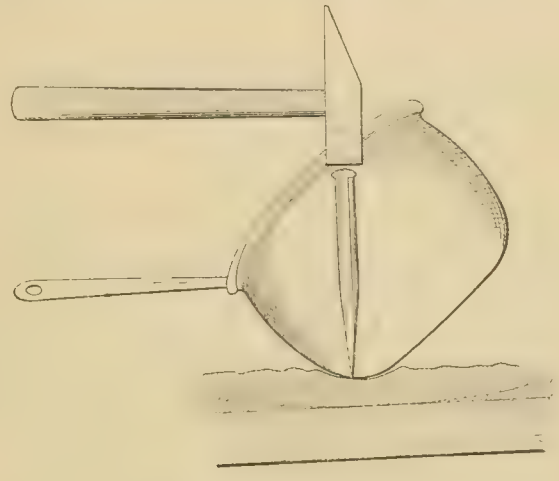
Soldering Flux.

From W. H. P., *Winnipeg.*—Please inform me through *The Metal Worker* the best flux in use for soldering tinware. We are using weak muriatic acid, but it discolors the tin and it takes too much time to brighten it up again.

Answer.—Rosin has always been regarded with favor for clean work, but if something different is desired some of the following may prove more satisfactory. The concentrated soldering flux sold by Paul Thomas, Richard and Delevan streets, Brooklyn, N. Y.; Gedney's soldering fluid, J. F. Farmington, 188 Grand street, New York; Perfection soldering fluid, Baltimore Chemical Company, 78 Gough street, Baltimore, Md., or Yager's soldering salts, Central Stamping Company, Cliff street, New York.

Repairing Tin and Agate Ware.

From E. D. S., *Newman, Col.*—The older readers of *The Metal Worker* may not be as much interested as the cubs in some shop craft I use. I have a way of trimming the bottom of tin coffee pots, kettles, &c., that does away with the old plan of sighting across the article and is more accurate. I first knock the bottom off with the sharp edge of a peining hammer, then with the snips I trim off to where the burr was turned when the article was new. This gives a straight edge to start from, and if necessary to cut off more I mark with dividers set at ¼ inch more or less as required all around the vessel. To put new bottoms on agate ware I cut off the old bottom with a chisel from the inside, as shown by the illustration, then smooth the edges on a stake with a mallet and chip off with the sharp pein of the hammer enough enamel to make room for the burr. The burring machine will chip off enough more so that it can be soldered on the inside with ease, using cut muriatic acid.



Repairing Tin and Agate Ware.

Gas Tar for Roof Paint.

From E. E. P., *New Haven, Conn.*—I noticed in *The Metal Worker* of September 16 a communication from "S. & H.," asking whether or not gas tar was a good preservative of sheet-metal roofs. In answer to the question it is denied that, as a preservative of tin, it could be recommended. I inclose a sample of tin which was taken from the hip of a slate roof on an engine house that was new two years ago last January, which speaks for itself. The tin is eaten away by the gases from the locomotives on the under side, leaving the top side of the tin bright. This was protected, as you will see from the sample, by coal tar. Thinking you might be interested in this experience and sample, as well as your readers, I have sent it in.

Note.—The tin has completely gone from the under side of the sample received, while a thick covering of tar is on the top side; but wherever the tar is scraped off the tin is in good condition, showing, as we stated in the answer quoted, that the use of gas tar is not always attended with bad results, though the general experience of those who have tried it has not been of a character that would encourage its general use.

Squaring a Circle.

From C. S. H., *Marblehead, Mass.*—Will you please give in *The Metal Worker* a rule for squaring a circle?

Answer.—A few years ago this question was answered in *The Metal Worker*, and as the conditions have not changed and are not likely to change, the same answer applies. We presume that our correspondent is aware that an exact method for squaring a circle has never been discovered, although mathematicians have been at work upon the problem for at least 2000 years. As commonly understood, however, squaring a circle means obtaining the approximate area of a circle whose diameter is known. Without going deeply into the mathematics of the problem, we think we can answer our correspondent satisfactorily by giving two simple methods of squaring the circle. The first is to multiply the square of the diameter, or in other words, the product of the diameter multiplied by itself, by 0.7854. This is a very accurate method, but another one that in some cases would be easier is to multiply the square of the diameter by the fraction $\frac{11}{14}$. To make use of a practical example to show the slight difference between these two methods we will assume that we want to obtain the area of a circle 10 inches in diameter. According to the first rule the area would be equal to $10 \times 10 \times 0.7854 = 78.54$ inches. By the other method it would be $10 \times 10 \times \frac{11}{14} = \frac{1100}{14} = 78.57$. The difference between the answers obtained by these two methods is only 0.03 square inch.

The Jamaica (W. I.) sugar crop is reported to be threatened with destruction by a new and baffling disease which has attacked the canes. Specimens of canes so diseased have been sent to Europe for examination of experts.

THE TIN SHOP.

Pattern for Elbow, Elliptical to Round.

From E. S., *New York.*—The following method for obtaining the pattern of a two-piece elbow, one end of which is elliptical and the other round, is presented to the readers of *The Metal Worker* for their consideration. In venient manner, the width L′ *c*′ being known. To obtain the width L′ *c*′ proceed as shown in Fig. 1. From K, on K F, set off the distance J E, as indicated by K *m*. Bisect F *m* in *n*, and take K *n* as the width L′ *c* in Fig. 2. The shape G′ L H′ having been established, divide it into any convenient number of equal parts, and from the

For convenience of designating these sections, which are shown in Figs. 3 and 4, they are lettered to conform with the large letters on section lines in A′ G′ H′ D′, which for convenience we will consider to be the plan. To construct section P draw the line *f*′ *a*′, in length equal to *f a* of plan, and from point *f* of section erect a perpendicular in length

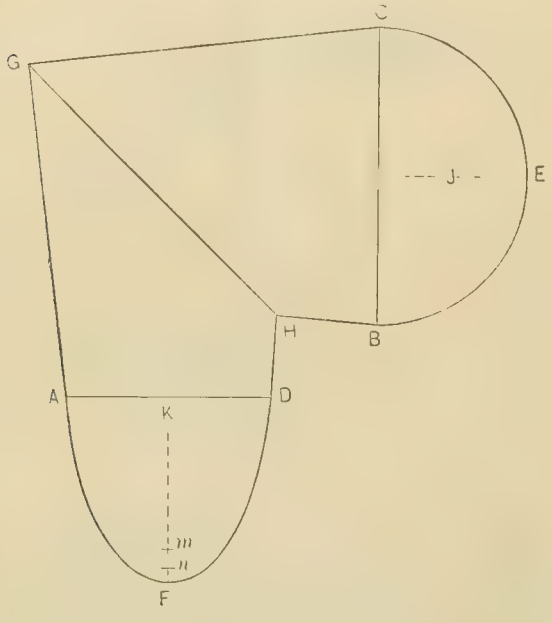


Fig. 1.—Elevation of Elbow and Half Profiles.

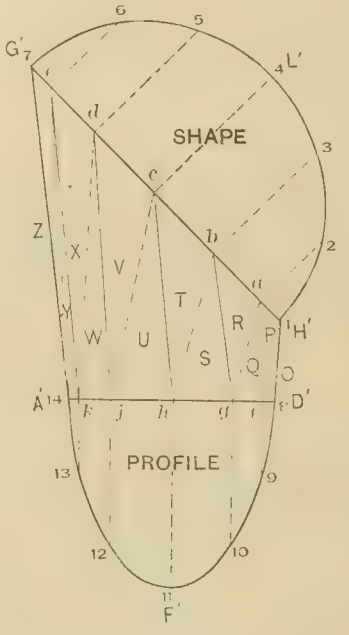


Fig. 2.—Divisions Drawn for Sections.

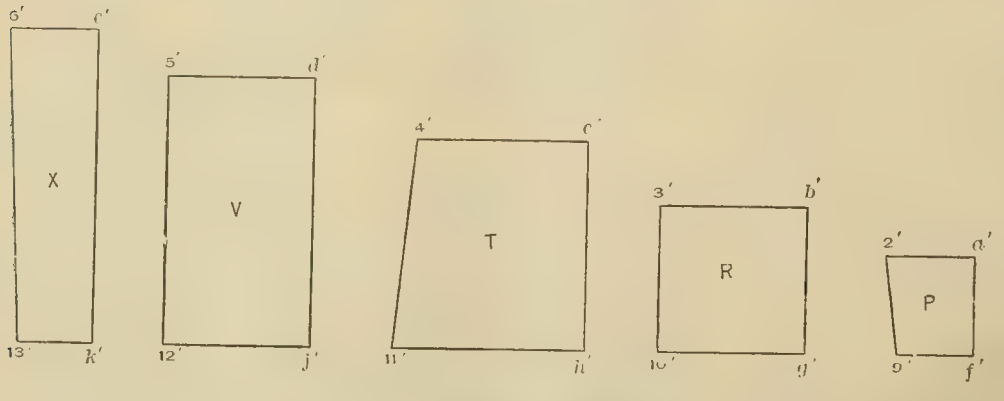


Fig. 3.—Sections Represented by Solid Lines, Fig. 2.

PATTERN FOR ELBOW, ELLIPTICAL TO ROUND.

Fig. 1, let A G C B H D represent the elevation of elbow, A F D the half profile of elliptical end and C E B the half profile of round end. In Fig. 2 A′ G′ H′ D′ F′ is a duplicate of part having similar letters in Fig. 1. The pattern A′ G′ H′ D′ will be obtained by the use of sections.

The first step will be to decide regarding the shape on miter line G′ H′. In the present instance an ellipse has been selected, as indicated by G′ L′ H′. This figure can be drawn in any con- points thus obtained drop perpendiculars cutting G′ H′, as shown. Also divide A′ F′ D′ into the same number of parts, and from the points thus obtained drop perpendiculars cutting A′ D′. Connect the points in A′ D′ with those in G′ H,′ as indicated by the solid and dotted lines. We will suppose that G′ L′ H′ and A′ F′ D′ were bent up at right angles to A′ G′ H′ D′. Our purpose is to construct sections that will give the distance between points in A′ F′ D′ and G′ L′ H′.

equal to *f* 9 of profile. From point *a* of section erect the perpendicular *a*′ 2′, in length equal to *a* 2 of shape H′ L′ G′. Connect 9′ 2′ of section. As previously stated, we will suppose that G′ L′ H′ and A′ F′ D′ were bent up at right angles to A′ G′ H′ D′. If section P was placed upright on plan with *f*′ *a*′ on *f a*, 9′ 2′ of section would give the distance between points 9 and 2. Regarding section R, *g*′ *b*′ of section is derived from *g b* of plan, *g*′ 10′ of section from *g* 10 of profile, &c. The distance 10′ 3′

of section represents the distance between points 10 and 3 in Fig. 3, when the article is formed as previously described. The other sections are obtained in a similar manner.

The sections represented by dotted lines in plan are shown in Fig. 4. To construct section O, proceed as follows: Draw the line f' 1′, in length equal to f 1 of plan. From f' erect the perpendicular f' 9′, in length equal to f 9 of profile. Connect 9′ 1′. With the article formed as previously described, 9′ 1′ of section gives the distance from 9 of profile to point 1 of plan. To construct section Q, draw the line g' a', in length equal to g a of plan, and from point a erect the perpendicular a' 2′, in length equal to a 2 of shape G′ L′ H′. From point g' of section erect the perpendicular g' 10′, in length equal to g 10 of profile A′ F′ D′. Connect 10′ 2′. With the article formed as previously mentioned, 10′ 2′ of section Q gives the distance between points 10 and 2. The other sections can be obtained by following the same method, as indicated by the letters and figures.

In Fig. 5, G1 H1 D1 A1 is the pattern of part of article shown in Fig. 2. G1 H1 of pattern is the stretchout of shape G′ L′ H′, and A1 D1 of pattern is the stretchout of A′ F′ D′. The distances represented by solid lines in pattern are obtained from the sides of sections in Fig. 3, as indicated by corresponding figures, and the distances represented by dotted lines in pattern are obtained in a similar manner from the sections in Fig. 4. Then to obtain the part of pattern shown in Fig. 5 by G1 H1 D1 A1, proceed as follows: At any convenient place draw the straight line H1 D1, in length equal to H′ D′ of plan. From H1 of pattern as center, with radius 1′ 9′ of section O, describe an arc, which intersect by a second arc struck from D1 of pattern as center, with radius D′ 9 of profile, thus establishing the point 9 of pattern. Then with radius H′ 2 of shape, from H1 of pattern as center, describe an arc, which cut with another arc struck from point 9 of pattern as center, and 9′ 2′ of section P as radius, thus establishing point 2 of pattern. With point 2 of pattern as center, and 2′ 10′ of section Q as radius, describe an arc, which intersect with another arc struck from point 9 of pattern as center, and 9 10 of profile as radius, thus establishing point 10 of pattern. With point 10 of pattern as center, and 10′ 3′ of section R as radius, describe a small arc, which intersect with one struck from point 2 of pattern as center, and 2 3 of shape as radius, thus establishing point 3 of pattern. Continue this process, locating in turn the remaining points in pattern, as shown. Lines drawn through the points thus obtained, as indicated by G1 H1 D1 A1, will be one-half of the required pattern. The other half, as shown by G1 H2 D2 A1, can be obtained in a similar manner, or by a repetition of the above process. The pattern for the other part of elbow, as shown in Fig. 1 by G C B H, can be obtained by the same method. The shape G′ L′ H′ is to be drawn to the left of the miter line G H, and the operation continued, using the same process, as shown in Figs. 3, 4 and 5.

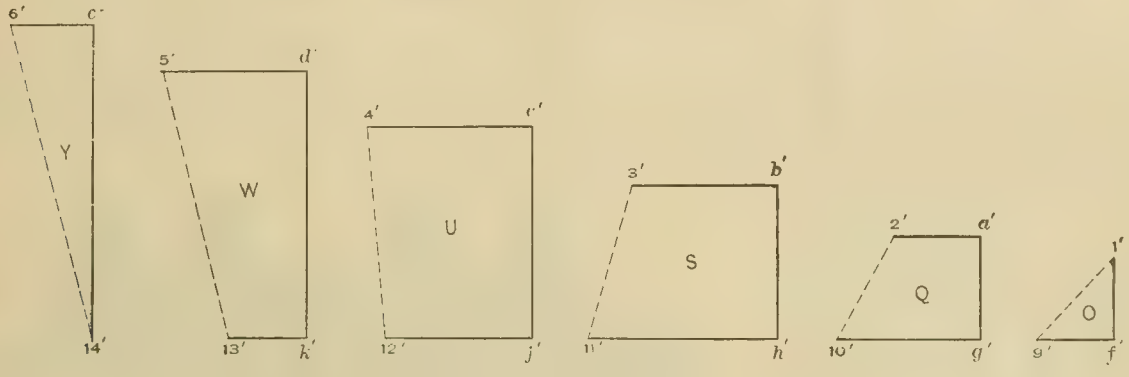


Fig. 4.—Sections Represented by Dotted Lines, Fig. 3.

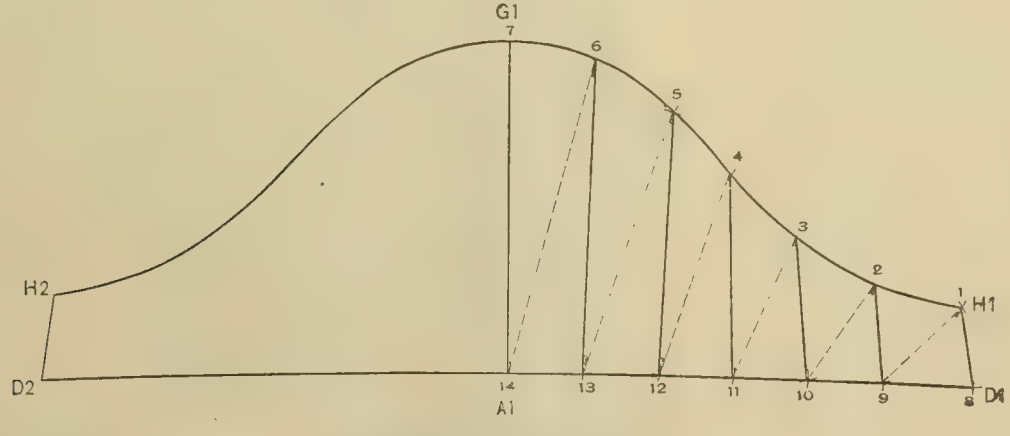


Fig. 5.—The Pattern Shape.

PATTERN FOR ELBOW, ELLIPTICAL TO ROUND.

Tin Mining in Tenasserim.

The tin bearing area in Tenasserim, Lower Burma, which during the last two years has been carefully surveyed by experts under the East Indian Government Geological Department, has been handed over under a concession to a Captain Menzell, who, says the *Indian Engineer*, has succeeded in organizing a powerful company in England to work the mines, with a guaranteed capital of about $10,000,000. If expectations in Tenasserim are realized, Lower Burma may become an important rival to the Straits. One or two previous attempts to exploit Tenasserim tin have failed owing to want of the precise information now supplied by the Geological Department, as well as to the ignorance of promoters of the methods of obtaining and utilizing Chinese labor, to which progress in Straits tin mining is mainly due. Captain Menzell is in these matters a thorough expert. His life has been spent in the Straits and in the neighboring colonies, and he has met with signal success in importing both Chinese and Indian labor to the British and Dutch possessions.

J. Warren Coulston of 505 Chestnut street has published a pamphlet descriptive of and setting forth the advantages of the Edward C. Broadwell process for coating iron and other metals with aluminum and its alloys by dipping and without the use of electricity. After cleaning the article he treats it with a flux containing a haloid salt of tin or of tin and zinc. Then he dips it in aluminum or an alloy. This substitute for tin has been called "aluron."

STEAM AND HOT WATER.

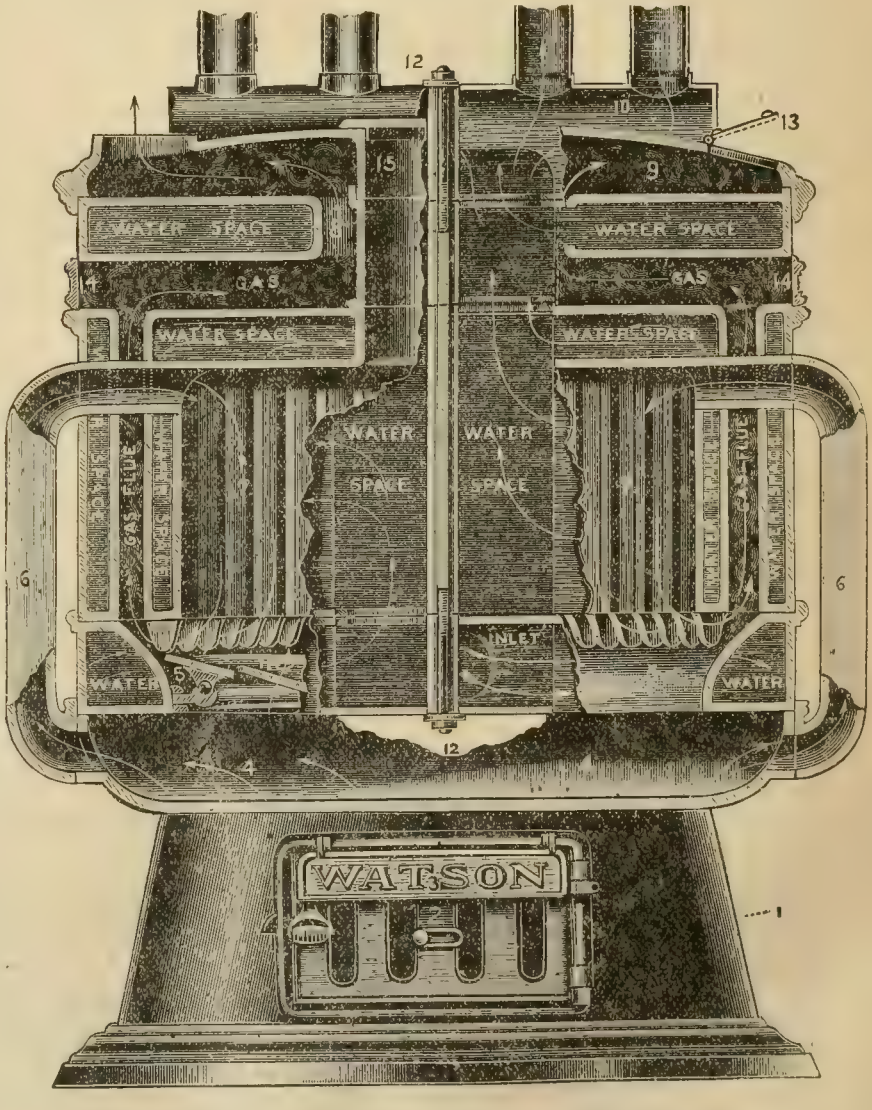
John Simmons Company's Catalogue.

We have just received illustrated catalogue No. 5 from the John Simmons Company, 106–110 Centre street, New York. It is a book of over 500 pages, 9 x 12 in size, bound in brown cloth, with the company's name in gilt letters on the front cover and the back. Record is kept of the disposition of the catalogues, as a paster inside the front cover says: "This book is registered No. 769." The title page gives a general enumeration of the line of goods they handle as wrought, cast iron and steel pipes, boiler tubes, fittings and brass work, tools and supplies for steam, water, gas, oil and electrical engineering. On another page, in an address "To our friends and patrons," they say that to the best of their ability they have endeavored to illustrate as many as possible of the articles used in the above trades. The catalogue divides the line of goods into seven classes, and an index in the back enables any desired article to be readily found. The first class devotes 48 pages to "Pipe and Fittings." Among the new things are the Netherland pipe hanger and a patent pipe coupler, by means of which a piece of pipe can be taken out of a system and replaced without disturbing any other parts. Class second devotes 78 pages to "Iron Body and Brass Valves, Cocks, &c.," for regulating pressure, to prevent vacuum, back pressure and for safety, with a plentiful use of sectional views showing the constructions. Class third devotes 100 pages to "Miscellaneous Brass Goods," including many forms of bibbs and cocks, air valves, steam whistles, water gauges, oil cups, gas fixture fittings and gas stoves. Class fourth occupies 50 pages in illustrating "Steam Heating and Fitting Specialties," including horizontal and vertical tube power boilers, a great variety of steam and hot water heating boilers, radiators, both direct and indirect, pipe coils, registers, steam separators, injectors, governors, indicators and other standard goods. Class fifth devotes 150 pages to "Plumbers' Brass Goods, Cast Iron Soil Pipe and Fittings, Earthen Ware, &c." Four special inset pages show round, oval and square lavatories on a buff enameled paper in six colors and gilt. As is indicated by the space given, an exhaustive line of plumbers' supplies is made a feature of the business of the house. Class sixth gives 50 pages to "Pipe Cutting and Threading Machines and Tools," and the line leaves little to be desired by the steam fitter, plumber or gas fitter. Class seventh takes 60 pages to show "Street Washers, Hydrants, Pumps, Hose Goods, Packings and Supplies."

With the catalogue comes a price-list of 350 pages in a flexible cloth cover, with the name in gilt and bound so the book will lay open at any page without the use of weights. One page is devoted to an announcement that the prices conform as near as possible to the standard lists. Then their terms, with another page giving their pipe cypher code and some instructions for orders by telegraph. At the back is an index, by the aid of which the price of any desired article can be readily found. Both the catalogue and the price-list give evidence that no little labor has been spent in arranging them to be of the greatest benefit to their patrons, and the publications will prove valuable additions to trade literature.

The Watson Perfect Combustion Heater.

In Annex D of the boiler room extension, Machinery Hall, at the World's Fair in Chicago, a hot water boiler is shown in operation, which is attracting much attention from experts. It is exhibited by the Watson Perfect Combustion Company of 53 Lombard street, Toronto, Canada. There are a number of very interesting points in the construction of this boiler, but the special feature is the principle of combustion. While the effective application of the heat to the body of water contained, and the rapid circulation of the water, are subjects which have received careful study and scientific treatment, yet above these has been placed the necessity of securing as perfect combustion of fuel as possible. The heater is so constructed that either anthracite or bituminous coal can be used. It is specially adapted, however, to the use of bituminous or soft coal. For this purpose it is constructed on the down draft principle. Fuel is fed in a magazine at the top. There is no feed door in front for supplying fuel in the usual way and thus admitting a blast of air to check the fire and permit smoke and smudge to escape. The construction will be more easily understood by an examination of the accompanying cut, which gives a sectional view of the heater.



The Watson Perfect Combustion Heater.

The object of the peculiar method of construction shown in this illustration is to heat the fuel before it reaches the fire and also to heat the air admitted above the fuel, in this way thoroughly mixing the gases liberated from the fuel with the heated oxygen and drawing

them downward through the heated body of fuel on the grate surface. In this way, it is pointed out, the heated body of fuel on the grate surface is always supplied with sufficient oxygen through the grate surface to support combustion, all gases liberated from the fuel being burned. The air for draft not being admitted in a compact body, but in small jets and highly heated, there is an intimate mixture of the particles of carbon in the fuel and the oxygen of the air, causing a gaseous flame with no perceptible smoke. The heater, as shown in operation at the exposition, is run on soft coal with apparently as little attention as is ordinarily given to hard coal fires. The manufacturers state that when the magazine is filled with soft coal no further attention is required for at least 24 hours, a uniform temperature being maintained during that period. In the circulation of the water care has been taken to avoid conflicting currents. The hottest section is just above the level of the grate. The water section is so constructed that any number of them can be fitted together to secure greater capacity.

The principle upon which the com bustion chamber of this heater is built is adapted to other purposes, as, for instance, the construction of hot-air furnaces or steam boilers for operating stationary or marine engines, and thus enabling soft coal to be used as fuel without the resultant nuisances of frequent feeding, stirring fires and making clouds of smoke and deposits of soot. Arrangements are being made for the manufacture of this apparatus in the United States, probably at Chicago.

The Monitor Steam Generator Mfg. Company

of Landisville, Pa., and 49 North Seventh street, Philadelphia, have just issued a 64 page catalogue, in handy form, descriptive of the Monitor instantaneous steam generators and Positive hot water circulators for heating dwellings and other buildings, and high pressure boilers for power purposes. The opening pages describe the generator as being composed of an outside water leg or double shell, made of boiler iron or steel, the inside fitted with one or more wrought iron worms or coils, which are connected to the water leg at both ends by nipples expanded into the shell. The shell is surmounted by a dome of cast iron, with neck for pipe, in which is placed a damper, a coal shute and cover, and small damper lid. The dome is secured to the shell by two studs and nuts, so as to be easily removed when required. A magazine is connected to the coal shute and is covered by a cast iron lid, which forces the fire and combustible gases to circulate through every part of the coils and produces, it is claimed, a perfect combustion, the different coils and spaces between them being so arranged that the heat reaches every part of their surface with almost equal intensity, thus reducing the expansion and contraction to a minimum. The lid or cover to the magazine can be raised by a handle at the back of the dome to receive coal and then be left to drop into place. The base is made of cast iron with a grate of the crusher type having three to five bars, which are worked with a lever at the right side. The long ends of the bars are extended through a plate bolted to the side of the base, and any or all of the bars can be taken out without removing the boiler. The ends of the bars are connected with a cross bar and operated with a lever. The base is also provided with a draft door and register. When in operation the generator is regulated by an automatic damper regulator. The hot water circulator resembles the steam generator, but has only a single shell and the coil surface is increased. The coils are connected to a manifold at the top, from which the mains are taken, and to a water leg at the bottom into which the returns discharge. In operation it is claimed that the heat, being most intense around the coil, starts the water into rapid circulation, and that, owing to the great velocity with which water is forced through the parts, incrustation of the shell or coils is impossible.

The high pressure boiler is described as possessing the same principle as the generator, but as being built with a view to having more water and steam space. There is a quantity of valuable information on the subject of heating contained in the catalogue, as well as tables, rules, forms of specification and contracts, price-lists of pipe and fittings, and 15 pages of testimonials. The catalogue is well illustrated and printed, and appears in imitation leather covers.

HEATING NOTES.

Thomas W. Weathered's Sons, at 244 Canal street, New York, report an active business in hot water heating goods, both for residence and horticultural work.

Jacob Reigner, Pottstown, Pa., makes a specialty of the Gorton boiler, made by the Gorton & Lidgerwood Company of New York.

One of the attractions at the Armstrong Mfg. Company, 252 Canal street, New York, is the pipe threading and cutting off machine, which handles pipe from 1 to 4 inches in diameter. The regular dies used in the hand tools for No. 3 are used in the machine for 1 and 2 inch pipe and No. 6 dies for 2½ to 4 inch. The machine has both a centering and gripping chuck and is made for either hand or power use. This machine is in lively demand among the steam and hot water fitting trade at the present time.

Chas. Yingling, a popular representative of the Nason Mfg. Company, 71 Beekman street, New York, stamps himself on the memory of his friends with an aluminum medal carrying a bust of Columbus and the dates 1492 and 1893 on one side. On the other is a bas-relief of a boiler with the wording, "High Duty Heaters. 10 to 1 Efficiency. Equator for Steam, Gulf Stream for Hot Water," and the address of the house.

The Gorton boilers, made by the Gorton & Lidgerwood Company of New York, will be run in Burlington, N. J., by Richard Hepworth, who makes a specialty of plumbing, steam and gas fitting.

A novelty in the way of a regulating device is the Mason vacuum valve, recently manufactured by the Mason Regulator Company of Boston for a large Canadian sugar refinery, which has now several in use. It is to the regulation of a vacuum what a reducing valve is to steam pressure, for by placing one of these valves in the exhaust pipe leading to the vacuum pump, any desired amount of vacuum may be kept in the chamber by simply adjusting the valve. It is especially desirable where different degrees of vacuum are desired in each one of a series of chambers, as in the triple effect process of sugar refining, and other processes where a certain vacuum is desirable.

H. B. Smith Company, 133-137 Centre street, New York, find the trade lively in heating apparatus, equally divided between steam and hot water. Some of their more important contracts at the present time are for installing indirect hot water heating plants.

Dewstoe & Schneider, 290 Seneca street, Cleveland, Ohio, issue catalogues respecting the Richmond heaters for steam and hot water, which they handle and sell. The frontispiece is a view of a pleasant-looking country house, beneath which is a wise sentence from that fountain of wisdom, Benjamin Franklin. It is: "A comfortable home helps to moral character and good citizenship." Of course the inference from this is that the Richmond heaters will contribute much to make the home comfortable. Those who are interested in the apparatus will find full descriptions in the pages which follow, and at the end are numerous testimonials and references from those who have used the heaters in Cleveland and other parts of Ohio.

The trade in radiators of the American Radiator Company, 92 Centre street, New York, is not confined to the United States alone, some considerable shipments having been made to European countries during the past season. At the present time proper attention to their general mail orders necessitates some night work.

The catalogue of the John Simmons Company, 108 and 110 Centre street, New York, reviewed at length in our Plumbing department, is a book that would be valuable to the heating tradesman.

Percival H. Seward, engineer at the New York office of the American Boiler Company, has recently returned from a trip to England. While there he visited some of the more prominent hot water heating houses, and discourses very pleasantly on the condition of affairs as he found them. He is of the opinion that the average hot water job in the United States presents a more attractive appearance than those installed in England.

The Penn Engineering Company is the title of a new concern commencing business at 312 Cherry street, Philadelphia. The company are prepared to undertake steam and hot water heating and ventilating. They also announce that they will prepare plans and specifications for the installation of power, heat, ventilation and light in all classes of buildings and superintend installations. Manuel J. Hanna, lately with the Onderdonk Heating & Ventilating Company, is engineer of the company and George W. Sickels is secretary.

Alex. B. Johnston, New York manager for Raymond & Campbell Mfg. Company, Middletown, Pa., informs us that his sales so far this year are more than double what they were a year ago. He also carries in stock a full line of repairs of the National Stove Company and the New York Stove Works.

The American Radiator Company, 111 and 113 Lake street, Chicago, are distributing as souvenirs of the World's Fair beautifully illustrated pamphlets entitled, "The Story of Columbus." The illustrations are taken from the 12 original life size oil paintings by the eminent Italian artist, Gregori, in the possession of Notre Dame University, at Notre Dame, Ind.

WORLD'S FAIR NOTES.

The Norton Emery Wheel Company

of Worcester, Mass., show at Column E 53, Machinery Hall, what they claim is the largest and most complete assortment of emery wheels ever shown in an exhibit. It is estimated that there are 50,000 wheels in the exhibit, from $\frac{1}{8}$ inch to 36 inches in diameter, and $\frac{1}{32}$ inch to 6 inches thick, of every conceivable shape and for every purpose. They also make a fine display of grinding machinery in operation. The Worcester twist drill grinder is shown in three sizes. Their Walker universal cutter and tool grinder will grind all kinds of cutters and mills, reamers, twist drills, taps, lathe and planer tools, and in fact every tool known in the machinery business easily and practically. External and internal grinding and surface grinding on cup wheel can also be done. A novel feature is that each wheel furnished with this machine, of which there are 18, in all different shapes, is mounted on an iron collet, which is drawn into a taper protecting spindle that insures the wheels' runperfectly true, however often it is changed. There is absolutely no chance for emery to get to the spindle or any of the bearings. The machine is really universal without being complicated and difficult to operate. In connection with the grinder is a friction countershaft which has five changes of speed. A speed of 20,000 turns per minute can be obtained for small interval grinding. It is claimed for the new Norton elastic wheel that it is superior for saws, cuts free, wears well, and will not case harden. These wheels are in regular daily use in the sawmill exhibit. In the arrangement of the display a great deal of ingenuity is shown. Ornamental columns made of emery wheels laid flat on one another form posts for the pavilion. On a show board in the rear are fastened numerous specimens of unmounted wheels. Ornamentation has been secured in notable instances by putting together two or more wheels of different sizes. A cornice of this character runs across the top of the show board. The small wheels are shown in cases. M. B. Hill is in charge of the exhibit.

Crane Company

of Chicago make a very fine display of malleable and cast iron fittings, brass and iron valves and cocks and other articles in the steam and gas fitting line at Column O 28, Machinery Hall. Much ingenuity is shown in the arrangement of this exhibit, which is exceedingly attractive, A number of tall composite columns have been erected, composed in some cases of valves, tapering from large sizes at the base to very small sizes at the top. In other cases fittings have been coupled together, their curves forming graceful outlines, such columns also tapering from large ones at the base to small ones at the top. The space is of liberal dimensions, nevertheless but a small portion of the company's products can be shown, as they manufacture over 7000 articles of this description. The exhibit comprises brass globe and angle valves in a great number of sizes and styles, brass gate valves, brass cross and check valves, brass hose valves, brass butterfly and throttle valves, brass safety valves, brass radiator valves, brass steam cocks, brass gas cocks, brass union elbows, brass expansion joints, brass pump valves, hose nozzles, hose couplings, hose clamps, corporation cocks, brass elbows, tees and crosses, engine trimmings of every character, including whistles, iron cocks for steam, gas and water, iron body globe and angle valves, iron body cross valves, iron body check valves, iron body safety valves, back pressure valves, iron body butterfly and throttle valves, foot valves, iron body expansion joints, iron body gate valves, cast iron fittings, cast iron flange fittings, malleable iron fittings, &c. There has been an enormous growth in the varieties and sizes of goods of this character caused by the complications of the business, which have sprung up within a comparatively few years, and the Crane Company have made special efforts to keep pace with the progress of the trade. They are large manufacturers of wrought pipe and have their own iron and brass foundries, so that they possess peculiar advantages to meet the requirements of the business. The company also make an exhibit of their own automatic air brake in the Transportation Building.

The Abendroth & Root Mfg. Company

of New York make an exhibit at M 28, Machinery Hall, of Root's spiral riveted pipe in 25-foot lengths and varying from 3 to 16 inches in diameter. These pipes are galvanized, coated with coal tar and asphalt, also plain black, as the purchaser may desire or the usage to which they are to be placed requires. The spiral seam is the strongest portion of the pipe, as has been proven in numerous experiments. This pipe is adaptable for water works use, distributing water mains and hydraulic mining. An advantage of this pipe is the ease with which it can be handled and transported, rendering it remarkably convenient for use in localities difficult of access or where skilled labor is scarce. A handsome lithograph of the Root water tube boiler as used in the great boiler house of the exposition is also seen here, encouraging the sightseer to investigate further.

Sedgwick Bros.

of Richmond, Ind., have erected an extremely attractive pavilion in the north end of the Horticultural Building at the World's Fair. It is composed of wrought-iron pipe, with an arched roof, poultry netting being fastened to the sides and top, round which vines are trained. Their exhibit of wire netting and fencing is extensive and well arranged. In one instance a huge column composed of rolls of netting has been erected, the column containing 5760 feet of netting. A very large roll is shown which weighs 660 pounds and is 560 rods long. Scattered about the inclosure, which is fenced with Sedgwick fencing, are lawn settees and chairs made of wrought-iron pipe, with seats and backs of netting. They are galvanized, and are not only comfortable, but are capable of resisting the action of the elements indefinitely.

Charles H. Besly & Co.

of Chicago make an interesting exhibit at Column I 49, Machinery Hall, of a number of specialties which they manufacture. Of these the Gardner grinder is the most prominent. It is a new tool, having but recently been brought out. It is designed primarily for grinding perfectly square surfaces. A steel disk, $\frac{1}{2}$ inch or more in thickness, has both sides grooved in concentric rings. Emery cloth or emery paper is then pasted to the sides, under heavy pressure, which forces the material into the grooves and causes it to adhere closely. The disks are then mounted on suitable frames in pairs, one at each end of a short shaft. A rest for the article to be ground is fixed in front of the side of the disk, and is accurately adjusted, so as to hold the article perfectly square. Two persons can thus work at one grinder. When one face of a disk is worn it is reversed, and after both sides are worn the disk is easily recovered. Rests of different patterns are provided for special work, as, for instance, for grinding pulley faces. Numerous specimens are exhibited of the work done on these machines. Besly's parallel clamps, now familiar to most machinists, are shown in great variety. Other articles exhibited are Gardner's adjustable stock and dies, Perfection oil cups and Helmet oil.

The Buckeye Iron and Brass Works

of Dayton, Ohio, make a very large exhibit of fittings and other brass work at Column K 44, Machinery Hall. In finely arranged cases they show a great variety of handsome specimens of finished brass goods for special purposes. On a large platform are erected high columns of brass valves, tapering from huge sizes at the bottom to very small ones at the top. In addition to this display of finished products, the company exhibit machine tools of their own design which have some interesting features. One is a milling machine for milling squares or hexagons on valves, &c., which uses as many cutters as there are sides to be milled, all of which work simultaneously. Another machine is a forming lathe, with a vertical slide and an automatic feed. The latter consists of a feed rod running along the back of the machine, which drives a worm that moves the slide by means of bevel gears and a vertical shaft. The forming tool is adjusted easily and simply to suit the character of the work to be done. The forming tool slide has in its face a circular recess, having dovetails at the top and bottom which correspond with dovetails at the top and bottom of an adjustable block. The block, being inclined as desired, is held in position by a vertical clamping bolt.

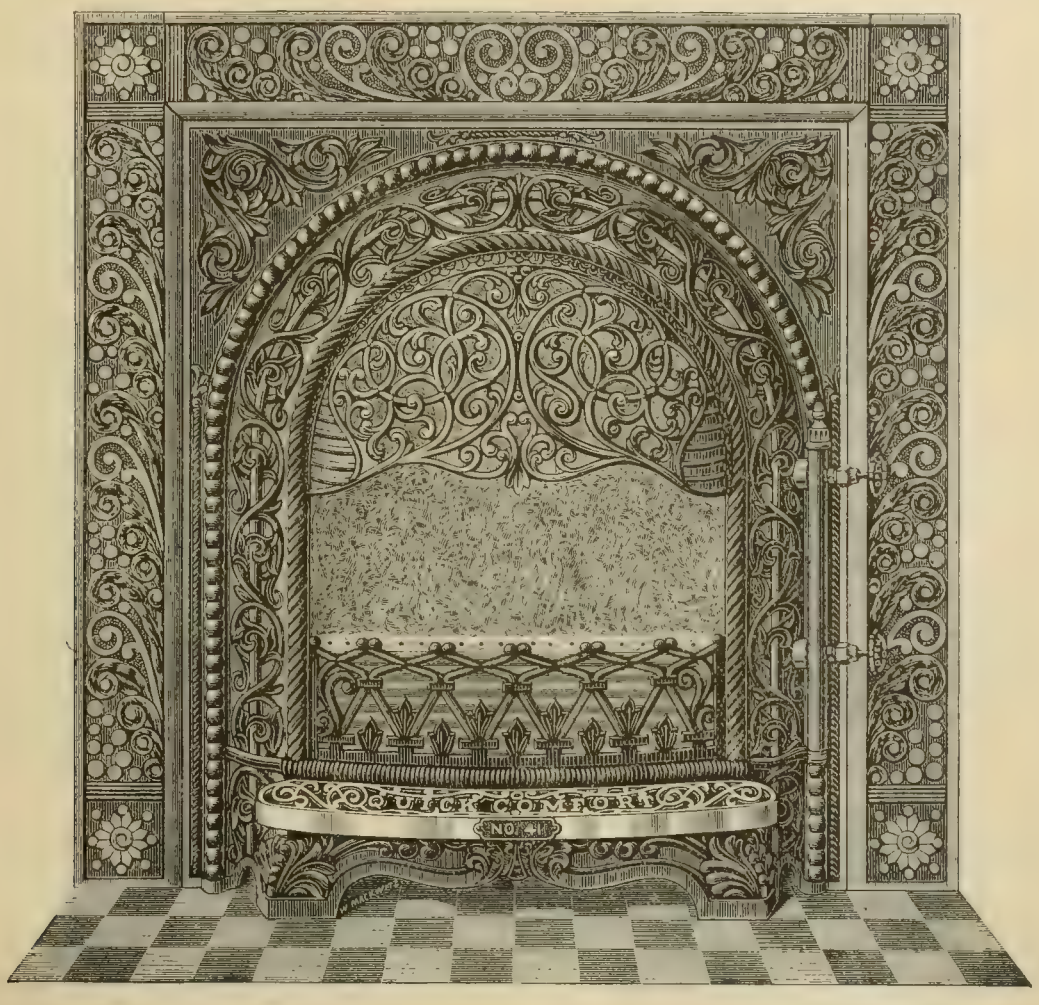
The Flint & Walling Mfg. Company

of Kendallville, Ind., have two exhibits, one at Column J 35, in Machinery Hall, and the other in the wind mill district outside. At the first-named location their well-known Hoosier lift and force pump is shown, adaptable to wind or hand use. Spray pumps and various other descriptions are also shown, while the feature which attracts most attention is undoubtedly an 8-foot mill on which the arms of the wheel are alternately finished in copper and brass while the casings are handsomely nickel plated. This wheel revolves and forms a part of the miniature water works for use in residences which is shown. Over in the wind mill section their Star mill proves worthy of its name. It has a direct stroke and is back geared, is simple in construction and perfectly self-governing, the crank movement doing away with side draft. These wheels are made from 8 feet to 26 inches in diameter.

Among new corporations chartered in Albany, N. Y., on September 28, was the Sheet Metal Works of Brooklyn, N. Y., a company formed with $10,000 capital for the manufacture and sale of metal goods. The directors are J. Fred. Pierson, Henry J. Pierson and William B. Ellison, all of New York.

Quick Comfort Fire Place Gas Grate

The Ringen Stove Company of 414 North Broadway, St. Louis, Mo., have added to their assortment of heating stoves a new line of constructions intended for burning gas as a fuel. These heaters are known under the name Quick Comfort and are so made as to present the appearance of bright, cheerful open fires. They are made in three sizes to fit any dimension of opening in the chimney breast. The front view of one size of the Quick Comfort fire place gas grate is shown in the accompanying illustration. The finish is in black japan with full nickel trimmings, although old copper in combination with ornamental tiles is supplied when so ordered. The flames impinge upon the asbestos covered reflector in such a way as to render the asbestos incandescent immediately upon lighting the burners. The grate is fitted with an adjustable damper which allows the gases to pass to the chimney flue. In this grate, the manufacturers state, coal gas, fuel gas, water gas, oil gas or natural gas may be employed. The company have just issued a little pamphlet illustrating and describing their new lines of gas heaters, which are made in several varieties. They also offer to the trade a six-flue radiator, the flues being made of Russia iron and the trimmings of nickel, with polished copper reflector so placed as to show the burners through the perforated base.



Quick Comfort Fire Place Gas Grate.

Cooking Schools.

The London *Gas World* says: "Within the last ten years the development of gas cookery has been very extraordinary. Exhibitions of gas appliances have been held all over the country by gas stove manufacturers, combined with free cookery lectures; and public opinion has been largely educated by these means. One aspect of the question is worthy of notice. We must all be conscious of the immense strides that have been made during the present generation in familiarizing the art of cookery in our country. After years of astonishing neglect, our education department at last awoke to the fact that cookery ought to form part of every woman's education; and during recent years county councils have also expended large sums on this important department of education. Schools of cookery have arisen in all the leading centers; and our board schools are now equipped with the necessary apparatus for teaching this important branch of domestic economy. It can scarcely have escaped the notice of observant spectators that this vital, but quiet, social revolution could not have attained its present dimensions but for the fortuitous circumstance of a new and much improved method of cooking —the introduction of the gas oven."

The course pursued by the English in giving lectures has not been followed in the United States, but might with as wide a benefit. The lectures there dealt less with the luxurious cooking as taught by the few who have discoursed on the subject here. With the desire to introduce their stoves among those with meager incomes, the information given did not forget the purse in pleasing the palate. Effort was made to teach a method of preparing the food provided to much better advantage than the method prevailing among the listeners, and also to select the food with the same end in view. Invariably the lecturers have been young women who have specially prepared for the work and received good remuneration. The example has not been without its effect even here, as may be appreciated by some attempt being made to teach cooking in some of our schools; but that it could be more widely followed and brought nearer to every home with advantage is not to be questioned.

L. Simonoff, a German inventor, has patented a series of test sheets for studying the amount of illumination of a hall or other large room, at different points. The test sheets are printed in black type on sheets which are successively darker in hue, from pure white to dark gray. It is found that for any particular brightness of illumination there is always one sheet that can be read, while the next one cannot be read. If the observer be a little color blind, the type can be obtained in modified colors so as to suit the case.

TIN PLATES.

The Tin Plate Report.

The following is a comprehensive synopsis of the quarterly report of Col. Ira Ayer, Special Agent to the Secretary of the Treasury, to which we made reference last week. He says:

During the quarter ended June 30, 1893, 35 firms manufactured 39,543,587 pounds of tin and terne plates proper, against an output of 29,566,399 pounds by 33 firms during the previous quarter.

The amount of American sheet iron and steel made into articles and wares tinned or terne plated was 2,322,455 pounds, making aggregate output for quarter 41,866,042 pounds; of the tin and terne plates proper 18,264,225 pounds, or more than 46 per cent., and of the aggregate 20,586,680 pounds, or more than 49 per cent., were made of American black plates.

The total consumption of American plates during the present quarter, including products from American sheet iron and steel terne, was 14,102,299 pounds, showing an increased consumption of American plates during the last, as compared with the previous quarter, of 6,484,381 pounds, or an increase of about 46 per cent.

Of the commercial plates 20,748,427 pounds, more than half of the whole, were coated with tin, and of these 19,425,336 pounds, nearly 94 per cent., consisted of the class of plates weighing lighter than 63 pounds per 100 square feet; 18,795,160 pounds were terne coated, of which 18,115,741 pounds, or more than 96 per cent., belonged to the lighter class. Of the entire manufacture nearly 95 per cent. belonged to the lighter class of plates.

Two firms whose output for the quarter, chiefly from foreign plates, is understood to have been in excess of 2,000,000 pounds, declined to make a sworn statement to the Government and no account is taken of their manufactures in this report. They are the Burn Stamping & Mfg. Company of Chicago Ill., and Saunders, Fielding & Bond, New York City.

The following is a comparative exhibit of commercial plates (tin and terne plates proper) for the fiscal years 1892 and 1893.

Production of Commercial Tin and Terne Plate in the United States.

Period of manufacture.	Amount made from— American black plate. Pounds.	Per cent. American	Foreign black plate. Pounds.	Per cent. foreign.	Total. Pounds.
Quarter ended—					
September 30, 1891	785,547	95.00	41,375	5.00	826,922
December 31, 1891	1,200,661	85.16	209,160	14 84	1,409,821
March 31, 1892	2,132,082	66.44	1,077 143	33.56	3,209,225
June 30, 1892	5,178,263	63.14	3,022,488	36.86	8,200,751
Total	9,296,553	68.12	4,350,166	31.88	13,646,719
Quarter ended—					
September 30, 1892	5,920,082	54.05	5,032,643	45.95	10,952,725
December 31, 1892	8,043,449	40.71	11,713,042	59.29	19,756,491
March 31, 1893	11,371,968	38.46	18,194,431	61.54	29,566,399
June 30, 1893	18,264,225	46.19	21,279,361	53.81	39,543,587
Total	43,599,724	43.68	56,219,477	56.32	99,819,202

The amount of American sheet iron and steel made into articles and wares tinned or terne plated during the two fiscal years was:

American Sheet Iron Wares Tinned or Terne Plated.

Quarter ended.	Pounds.
September 30, 1891	1,129,217
December 31, 1891	1,359,330
March 31, 1892	1,488,261
June 30, 1892	1,644,059
Total fiscal year ended June 30, 1892	5,629,867
Quarter ended.	Pounds.
September 30, 1892	1,276,932
December 31, 1892	2,472,963
March 31, 1893	2,730,331
June 20, 1893	2,322,455
Total fiscal year ended June 30, 1893	8,802,681

This makes the aggregate manufacture of tin and terne plates in the United States during the fiscal year ended June 30, 1892, 19,267,586 pounds, and during the fiscal year ended June 30, 1893, 108,621,885 pounds; the last-named amount being more than 8,000,000 pounds in excess of the estimated output for the year as shown by the previous reports.

The total American plates used in manufacture of fiscal year ending June 30, 1892, was 14,917,420 pounds, against 52,402,405 pounds during the last fiscal year. Of the commercial plates manufactured in the fiscal year ending June 30, 1892, 33 per cent., and in the last fiscal year ending June 30, 1893, 46 per cent., were tinned as distinguished from terne. During the fiscal year 1892, 90 per cent. of the output of commercial plates were of the class weighing lighter than 63 63 pounds per 100 square feet, and of 1893, 94 per cent.

The sworn statements of producers of black plates in the United States show:

American Production of Black Plates.

Period of production. Quarter end'g:	Lighter than 63 pounds per 100 sq. feet. Pounds.	63 pounds per 100 sq. feet and heavier. Pounds.	Total. Pounds.
Sept. 30, 1892	4,821,180	4,202,277	9,023,457
Dec. 31, 1892	8,575,541	5,444,675	14,020,216
March 31, 1893	13,287,507	6,361,848	19,649,355
June 30, 1893	14,208,192	6,780,321	20,988,573
Total	40,892,420	22,789,121	63,681,541

From these figures of the entire production of 63,681,541 pounds, 40,892,420 pounds, 64 per cent., were of the lighter class.

Of the tin and terne plate manufactures of the year 52,402,405 pounds were American, or 82 per cent. of the entire black plate production of the country for the year.

Colonel Ayer's report of February 20, 1892, showed that one-third of the net importations lighter than 63 pounds per 100 square feet during the fiscal year ending June 30, 1892, was 79,307,939 pounds. The output of tin and terne plates proper of the lighter class during the fiscal year ended June 30, 1893, was 93,850,487 pounds, showing thereby an excess, under the former interpretation of the law, over and above what may be termed the one-third requirement, of 14,542,548 pounds. This is exclusive of the manufactures of American sheet iron and steel made into articles and wares tinned or terne plated.

The total production of commercial tin and terne plates from American black plates of the lighter class during the fiscal year was about 94 per cent. of the entire product,

	Pounds.
or	40,983,741
Add products from American sheet iron and steel tinned or terne plated	8,802,681
Total	49,786,422

The product from American plates during the fiscal year ended June 30, 1892, of the kind subject to comparison with net importations was about five-eighths of the amount necessary to enable manufacturers to meet the one-third requirement under the law, comparison being made with the net imports of the fiscal year ended June 30, 1892.

The report then gives some details of the quantity of tin plates and terne plates imported and entered for immediate consumption and of such as were imported on and after July 1, 1891, and were withdrawn from warehouse for consumption during the fiscal year ended June 30, 1893, and concludes:

From these figures it is seen that of the class of plates weighing lighter than 63 pounds per 100 square feet, there were:

Imports of Tin and Terne Plate:

	Pounds.
Total imports year ended June 30, 1893	594,224,047
Total exports year ended June 30, 1893	128,091,811
Net imports	466,132,236
One-third of which is	155,377,412

One-third of the net imports of the fiscal year ending June 30, 1892, was 79,307,939 pounds, or about one-half

net imports last fiscal year. The aggregate of the entries for immediate consumption and of the withdrawal entries for consumption of tin and terne plates was

	Pounds.
	611,949,980
Domestic product.....	108,621,883
Total.....	720,571,863

This would indicate that the entire consumption of the country during the fiscal year ended June 30, 1893 was 720,000,000 pounds, of which more than 15 per cent. was of American manufacture.

During the three fiscal years ended June 30, 1890, there were imported in the United States of tin and terne plates and taggers' tin an average of 678,000,000 pounds annually.

SCRAP.

THE WORKMEN at the Tintern Tin Plate Works, near Chepstow, England, which were idle for nearly six weeks in consequence of the coal strike, were informed recently that the state of the tin plate trade was so bad that it was impossible to restart the works on a paying basis unless the men rendered some assistance to the management by making some concession. This, after consultation with the officials of the Tin Platers' Union, they declined to do. Consequently the works remain idle and great distress is felt in the neighborhood.

THE ANNUAL MEETING of the stockholders of the American Tin Plate Company was held September 27, at the office of the company, Ellwood, Ind., the following stockholders being present; Col. A. L. Conger, Akron, Ohio; E. F. Latham, Pittsburgh, Pa.; E. M. Bloomfield, Peru, Ind.; I. L. Morris, Chicago, Ill.; J. L. Morris, Boston, Mass.; E. M. Stanford, Atlanta, Ind.; J. F. Hazen, Cincinnati, Ohio; J. Lee Yarman, Richmond, Ind.; M. P. Hutton, Richmond, Ind.; W. B. Leeds, Richmond, Ind.; W. Hollingsworth, Richmond, Ind.; D. G. Reid, Richmond, Ind. The report of the past fiscal year was very satisfactory. The company have succeeded in obtaining a good reputation for their American brand of tin plates and have plenty of orders on their books at present. A dividend of $2 per share was declared, and it was decided not to extend the size of the plant at present, in view of the unsettled condition of tariff legislation and other matters. Following is a list of officers elected: President, Col. A. L. Conger; vice-president, John F. Hazen; treasurer, W. B. Leeds; secretary, D. G. Reid. These gentlemen also comprise the directorate.

ALL THE MILLS of Wallace, Banfield & Co., Limited, at Irondale, Ohio, manufacturers of tin and terne plate and iron and steel sheets, have been running full for two weeks past. The firm have had six tinning stacks in operation, and will put on additional ones during the week. They are a little behind in orders for immediate shipment, but have very few orders booked for late delivery.

THE WORKS of the Morewood Tin Plate Mfg. Company, at Elizabethport, N. J., have been closed down indefinitely, and the workmen discharged. The owners have not yet decided whether the cessation of work in this establishment will be permanent or not. Meanwhile the tin plate works of the Morewood firm at Gas City, Ind., are being actively operated. J. H. Rogers, the head of the Morewood interests, arrived from England last week, and has been staying in New York until yesterday, when he left for Gas City.

HEATING AND PLUMBING.

NEW WORK AND CONTRACTS.

BIDS will be received at the office of the Supervising Architect, at Washington, D. C., until November 2, for work on the United States Post Office building, at San Jose, Cal., including the plumbing and gas piping. Drawings and specifications may be obtained at the office of the superintendent, at San Jose, or from the Supervising Architect, at Washington.

FARNHAM & ALBEE of St. Johnsbury, Vt., have been awarded the contract for placing the steam heating plant in the new Drouin Building.

THE CONTRACT for heating apparatus for the new Toronto drill hall has been awarded to Bennett & Rice of Toronto, Canada.

D. AHERN & SON, Fond du Lac, Wis., have secured the contract for the hot water heating system to be placed in the Warden's new home it the State Prison at Waupun. They also have the contract for a similar job for the Dodge County Jail, at Juneau.

THE BOARD OF EDUCATION of Detroit, Mich., will receive bids up to October 10 for the furnishing and placing in position of heating and ventilating apparatus required for the Washington School.

THE JOINT BOARDS of the Public Library and Museum at Milwaukee, Wis., will receive bids until November 15 for a new building, which will include plumbing, drainage, gas fitting and heating apparatus.

AT A SPECIAL MEETING of the School Board of Sheboygan Falls, Wis., $1000 was voted to repair and remodel the heating apparatus of the High School.

T. P. TURNER of St. Louis has been awarded a contract for new plumbing in the Court House and Jail in St. Louis County, at a cost of $628.

THE STOVER HEATER COMPANY, Freeport, Ill., have been awarded the contract to place one of their heaters in the Exchange Hotel at Savanna.

THE SUM of $1850 has been appropriated for furnishing and heating the Alms House extension at New London, Conn.

SMITH & WEBSTER, 193 Lake street, Chicago, are to furnish Metropolitan closets and other plumbing fixtures for the stations of the Lake Street Elevated Railroad. Also 148 Italian marble Mondete lavatories for the Old Colony Building, Dearborn and Van Buren streets. The State House at Topeka, Kan., is also to be supplied with plumbing goods by the above firm.

THE J. L. MOTT IRON WORKS, 311 and 313 Wabash avenue, Chicago, are furnishing their Titan water closets for the passenger stations of the Metropolitan Elevated Railroad. They are also furnishing their Demorest water closet ranges for the public schools of Chicago, Ill.; San Francisco, Cal.; Eau Claire, Madison, Milwaukee, Wis.; Evanston and North Evanston, Ill.

THE TOWN MEETING at Revere, Mass., recently refused to authorize the expenditure of $1500 to complete the plumbing and heating work in the fire station. It is possible that the heat of the argument indulged in will sufficiently warm the building, but whether the fire hose will serve satisfactorily as a plumbing job is open to question.

JOHN REGAN, 153 Franklin street, New York, is doing the plumbing for the new armory of the Seventy-first Regiment, on Lexington avenue, running from Thirty-fourth to Thirty-fifth street.

THE UNITED STATES RUBBER COMPANY, 90 Reade street, New York, are having a No. 5 Mahony hot water boiler installed to heat their building, by E. J. Brady of 58 Warren street, who does not confine his hot water practice to kitchen plumbing alone.

THE CITY OF CHICAGO is to build an 18-room school building at the corner of Point and Cornelia streets, that will have a system of plumbing, be lighted by gas and will require a steam heating and ventilating plant.

J. G. BEATTIE of Minneapolis, who bid $3410, has been awarded the contract for the plumbing in the new library building at the State University. The contract for the heating and ventilating was held for further consideration, the bids received varied from $8,000 to $13,000.

THE PLUMBING AND GAS FITTING will be included in the general contract for building a new normal school at Stevens Point, Wis, the heating and ventilating plant will be awarded under a separate contract. Bids will be received by W. D. Parker, Capital Building, Madison, Wis., up to October 20.

AT A RECENT MEETING of the Commissioners of DeKalb County, Ill., an appropriation of $1200 was made to put in a heating plant and two bathtubs at the alms house.

THE BOYS' REFORM SCHOOL BUILDING on Bladensburg road at Washington, D. C., is to have a new steam heating plant.

H. A. R. DIETRICH, Bethlehem, Pa., is engaged in placing a steam heating plant in the Globe Building, a large office structure in that city.

Advices from Cleveland, Ohio, report that freight rates on the lakes have at last reached a profitable basis, and many boats are coming out of ordinary. For the remainder of the season business is likely to be brisk with the better class of lake shipping. Ore tonnage commands 90 cents and $1 a ton from Lake Superior ports, being about twice the rates of six weeks ago and very nearly up to the best level of last year.

The new Cunarder "Lucania," before leaving Liverpool on her second trip, had the pitch of her propellers altered to prevent the vibration experienced during her initial voyage. The alteration is reported to have been entirely successful in removing the defect.

A sign of reviving business in the coal trade is seen in the announcement from Shenandoah, Pa., that the employees in all collieries operated by the Philadelphia & Reading Company have commenced working on full time, and will be paid 5 per cent. above the $2 50 basis, the highest wages paid for many years.

PLUMBING and GAS FITTING.

Bacteriology and Sanitary Plumbing.

The following letter from Clarence O. Arey, Philadelphia, appeared in the *American Architect* September 30:

Having dropped the practice of architecture for the study of hygiene, and in particular that branch of it called bacteriology, I am led by the decided change in my views, produced by this study, to write you a few lines regarding sanitary plumbing. The whole system of plumbing, required in all our leading cities, is devised with the idea of keeping out that great bugbear "sewer gas." Now the question immediately arises, what is sewer gas? In order to answer this it is necessary to give a short explanation of the lives and functions of those minute organisms called bacteria.

These are complete organisms consisting of a single cell which live upon organic matter and excrete other matter. They are divided into two general classes—those that live upon dead organic matter and those that live upon living organic matter. Now those that live upon dead organic matter have many gas producers among them—that is, they absorb the dead organic matter as their food, and excrete nitrogen, carbon, sulphur, hydrogen, &c., or gaseous compounds of these. I can now think of no gas producing bacteria that produces disease in man. This gas is as harmless as the gases produced in a chemical laboratory. All that is necessary for safety is their dilution with air below a dangerous limit. This explains why men work continually in sewers and remain perfectly healthy.

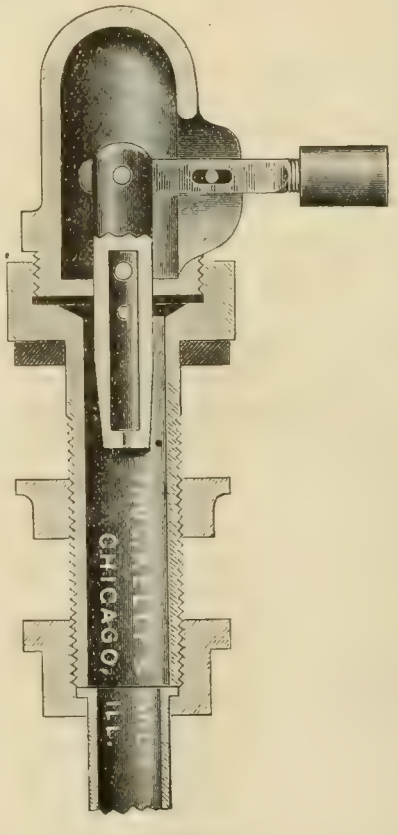
Take an ordinary waste pipe in a dwelling house, the sides up to the parts of the fixtures that are exposed in the room are covered with slimy organic matter, upon which millions upon millions of bacteria are growing. A colony of them which has located themselves below the trap can easily grow up through the slimy matter in the water of the trap to the same matter above the trap; the water in no way impedes their growth, indeed it aids most of them.

Now what we want in a system of plumbing is to keep disease out of the house. The disease producing bacteria will grow in this slime in the same manner as our friends the bacteria who reduce dead organic matter to simple chemical elements—*i. e.*, sewer gas. Now if these disease producers are in the sewers, as in an epidemic, or have been introduced into the waste pipes of a house by the careless disposal of the excreta of a person sick with a contagious disease, what means have we to prevent them from entering our houses? Nothing, except in houses that are provided with fixtures that are easily, amply and continually flushed. Back vents placed along the lines of waste only add extra surface to grow slimy. Main lines of ventilation, of course, dilute these gases, whose only harm is the power of displacing some of the oxygen in an apartment. Our breath is equally bad.

Cleanliness is our only safety. This applies to the waste pipes as well as the fixture. Simplicity, of course, promotes cleanliness. I would drop all back vents; carry all main lines of waste pipe through the roof; prohibit by law the use of any fixture that has an overflow that cannot be easily cleaned; provide flushing tank fixtures and have all surfaces around plumbing accessible for cleaning and made of non-absorbent materials as far as possible.

New Ball Cock.

The accompanying illustration shows a ball cock for which Thomas Kelly & Brothers, Chicago, Ill., were granted a



New Ball Cock.

patent September 19, 1893. The rod connecting to the float passes out of the casing of the cock through the waterway, thus avoiding the necessity of a stuffing box. The spindle or waterway is hollow, with three openings. The water enters through the lower holes and passes out to the tank through the upper one. When the tank has emptied its contents the supply is all cut off except the small opening at the lower end of the spindle, which admits enough water to gradually raise the float and open a full head of water. It thus breaks the syphon and prevents continuous syphoning. The outlet of the valve is submerged before the valve is opened full, the principle being the opposite of a cup leather, the pressure of the water having a tendency to close the leather diaphragm tighter around the spindle. The points claimed by the manufacturer are a syphon breaker, waste preventer and a silent valve. The firm also make a self closing basin cock on the same principle.

TRAPS AND VENTS.

BUILDING INSPECTOR LANE of Butte, Mont., has prepared a sectional view showing the plan on which plumbing must be constructed in accordance with the new plumbing regulations.

E. ASPINALL, 98–100 Beekman street, New York, who hitherto has confined himself almost exclusively to handling porcelain bathtubs, largely the production of English potteries, will now give attention to enameled iron bathtubs. There will be a good assortment of porcelain lined tubs in both rolled and hardwood rims. The Unitas closet, dealt in by the house, is now furnished with a handsome new pattern seat and cover, trimmed with nickeled metal parts of improved design. One of the features is the extension attachment, which compensates for any inequalities in distance between wall and closet and obviates the necessity of a wood back. The parts are held firmly by a thumb nut underneath.

AT A RECENT FIRE at Alpena, Mich., C. T. Park's plumbing establishment sustained considerable damage.

A. E. PEASLEE & Co., formerly of Sioux City, Iowa, are about to open a new plumbing establishment in Austin, Minn., occupying one of the stores of Joseph Keenan on Bridge street. They will make a specialty of all kinds of plumbing goods, together with steam and hot water heating goods.

THE EL PASO PLUMBING & SUPPLY COMPANY have been incorporated at Denver, Col., with a capital of $50,000. They will do business in El Paso, Pueblo, Fremont, Arapahoe and Douglas counties. The principal office will be located at Cripple Creek, Col.

THE BAILEY-FARRELL MFG. COMPANY, Pittsburgh, Pa., issue advance sheets of the catalogue that they are soon to publish. The eight pages that we have received relate to the Vedalia ejector syphon closet. Full page engravings show this closet of oval form and with square back in two combinations; also a sectional view of the closet showing arrangement of passages and vents and its operation during discharge. A similar view illustrates the features of the Triumph tank, made by this firm. In addition to the excellent illustrations, full particulars are given of the different combinations in which the closets are sold.

THE JAMES ALLISON PLUMBING COMPANY of Cincinnati, Ohio, are in the hands of a receiver for the purpose of rearranging their business.

CRAIGHEAD & Co. are a new house that will open a plumbing and gas fitting establishment in the Blease Building, at Broadway and Fifth street, Greenville, Ohio.

A FIRE last Sunday night partially destroyed the Enterprise Sanitary Pottery, at Trenton, N.J., one of the largest

owned by the American Pottery Company. The offices and warerooms were burned, with a large stock of molds. Manager Magowan places the loss as high as $100,000. Some large orders had recently been placed and the establishment was to have started in full operation the next morning after a shutdown of several weeks. The main workrooms and the decorating establishment were saved, but the loss of molds will make a delay of several weeks. The fire is supposed to have been of incendiary origin.

O'Brien & Ryder, 154 Spring street, New York, report an active trade. They have some large warehouse and loft plumbing contracts in course of completion.

E. J. Brady, 58 Warren street, New York, finds it necessary to put on more plumbers to meet the demands of his customers.

The Conference Committees of the Master and Journeymen Plumbers' Associations of New York meet regularly on the second and fourth Tuesday evenings of each month, and to these meetings is largely due the absence of any wide difference existing between the men and their employers. All complaints are heard, investigated and adjusted, so as to continue satisfactory relations.

Last Thursday night John Mitchell, vice-president of the National Association of Master Plumbers, H G. Gabay, president of the Master Plumbers' Association of New York, Thomas H. Radcliffe, president of the Master Plumbers' Association of Brooklyn and other association workers, were at Wilmington, Del., to aid in reorganizing the Master Plumbers' Association in that city.

The regular bimonthly meeting of the Master Plumbers' Association of New York was held last Tuesday evening and was a short session. At a previous meeting resolutions of condolence on the death of Colonel Auchmuty were passed and ordered engrossed, and a copy sent to his family. The resolutions were prepared by members who form one of committees of the New York Trade School.

H. J. Pattison of Montgomery & Pattison, 256 West Eighteenth street, New York, was formerly plumber of the Brooklyn Navy Yard and now holds the office of secretary of the Master Plumbers' Association of New York. At present the firm are busily occupied on contracts and have their office decorated with pictures of some large and handsome buildings in which they have done the plumbing.

J. H. Welteroth, Williamsport, Pa., who is an experienced tinner and a specialist in hot air furnace work is adding plumbing as a branch to his business, having secured a first class plumber for a superintendent of this department. He recently spent a few days in Philapelphia and New York buying Lily tin plate, looking up plumbing goods, visiting the Howard Furnace Company, and taking a view of the new things in steam and hot water heating goods.

Pierce, Butler & Pierce Mfg. Co., Syracuse, N. Y., and 42 Duane street, New York, have issued a catalogue devoted to Lead Pipe, Solder and Sheet Lead, Gas, Water and Steam Supplies, Sanitary Specialties, steam and hot-water Heaters and related goods. The catalogue contains 465 pages, handsomely bound in cloth with an index alphabetically arranged at the back. The company are the patentees and sole manufacturers of the Florida steam and hot-water Heaters, of which illustrations and price-lists are given, showing the complete line, including the latest improvements. The book is copiously illustrated, with list prices accompanying the illustrations, showing large lines of the goods already mentioned. A telegraph code is given for ordering wrought or cast iron Pipe, also for questions, answers, orders and shipments, discounts, &c. The work is very complete and will aid in an intelligent ordering of goods.

Henry J. Maar and George Maar, both experienced workmen, are about to open a plumbing, gas fitting, steam and hot water business establishment in a store that has been remodeled for them, at 16 Washington street, Poughkeepsie, N. Y.

Stewart, Smith & Bergen, Fort Plains, N. Y., have added a plumbing branch to their business.

Bernard's Gas and Pipe Pliers.

The accompanying cuts represent pliers put on the market by the Wm. Schollhorn Company, New Haven, Conn.; Julius Berbecker & Co., 65 Duane street, New York, agents. The pliers shown in Fig. 1 are made in 4½ and 5 inch sizes, for use on burners and small pipe, while the larger cut, Fig. 2, shows the 7-inch size for small and large pipe. All sizes are made of crucible steel, polished and nickel plated. The manufacturers claim that the parallel movement of the jaws with the short fulcrum of the handles on the jaws gives them the advantage of having double the gripping power of the ordinary gas pliers. They state, therefore, that the smaller sizes, which can be carried in the pocket as conveniently as a knife, are as powerful as the ordinary gas plier of double the weight and size. In the large size pliers the parallel jaws open wide enough, and have circular grooves, so that small pipe or rods may be gripped and held lengthwise, as well as in the ordinary manner.

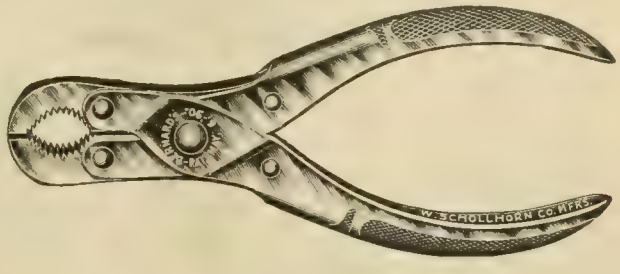


Fig. 1.—Bernard's Gas Pliers.

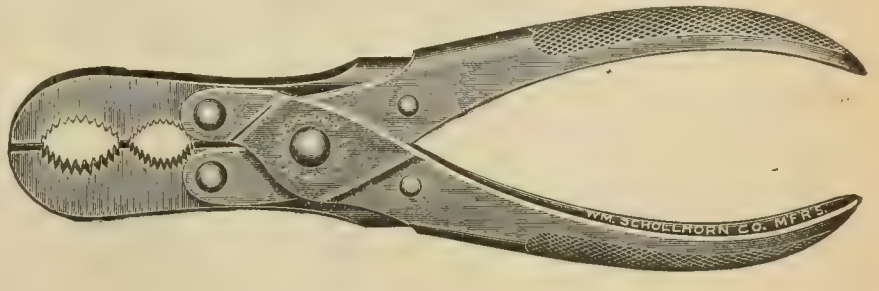


Fig. 2.—Bernard's Pipe Pliers.

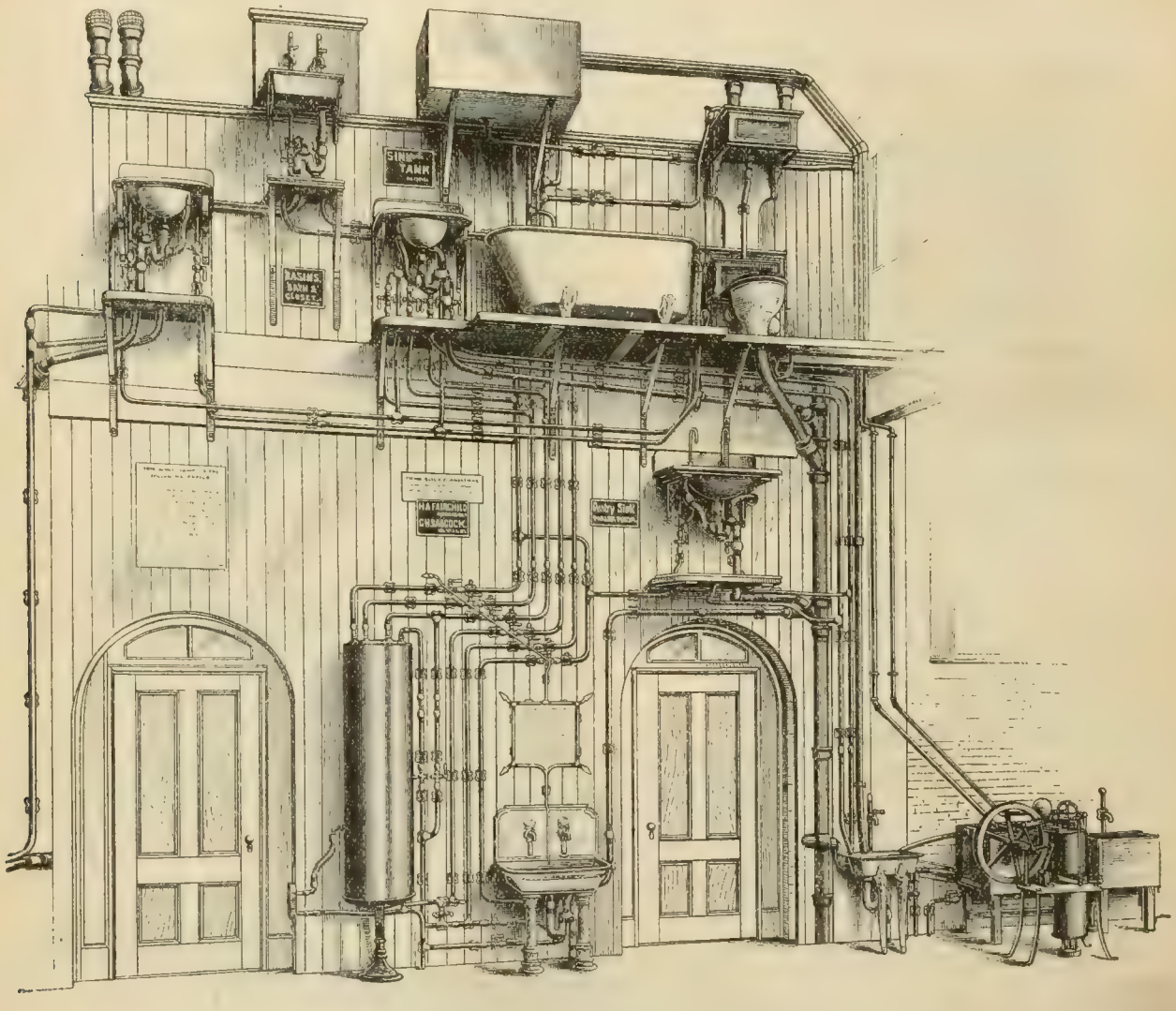
The New York Trade School.

EXHIBIT OF STUDENTS' WORK.

In the account of the closing exercises of the New York Trade School for the season of 1892–1893, which appeared in *The Metal Worker* April 15, brief reference was made to the exceptionally good work of the students of the day and evening classes of the plumbing department. The principal exhibit was what may be described as a section of a house with plumbing complete from kitchen to roof. This work was designed by Mr. Delehanty, the manager of the plumbing department, as the best way to familiarize the young men with the work as done in private houses. A convenient space along the wall where the roof rose to its highest point was selected to represent the section of the imaginary dwelling. Beams placed horizontally divided the several floors, and on the wall at the place indicated the fixtures were set up as shown in the illustration, as follows: On the top or third floor there was a servant's slop sink and the house tank with its supply, overflow and tell-tale pipes in the most orthodox fashion. On the second floor the bathroom fixtures, consisting of bath, basin and water closet, were in position, besides a basin supposed to represent what would be in the front bedroom, while a butler's pantry sink was on the first floor. The sanitary work was most creditably executed, the water closet being porcelain, with trap and bowl in one piece, connected with the floor by means of the regulation brass floor plate, and the other fixtures provided with facilities for hot and cold water supply, and safes and safe wastes in every instance. Independent vertical lines of soil and vent pipes were carried above the line indicating roof and finished with the wire basket usually used in New York.

The basement floor showed the kitchen work, the principal feature of which was a double boiler with its

supply and distributing and circulation pipes fully exposed to view, and so arranged as to provide for tank and street pressure, with the necessary cut-off stop and waste cocks and facilities for the thorough drainage of pipes where necessary. So complete was this exhibit, both as an evidence of the judgment of the designer and the ability of the students, that all that seemed necessary to complete the illustration of a perfect system of house plumbing were the house drain, with its running trap and fresh-air inlet, and the leader with its trapped connection therewith. These were omitted because of there being no cellar in which to lay a house drain, but it is generally conceded that the plumber who can successfully execute all of the lead work required in a dwelling may be safely relied upon to do the iron work in the cellar.



The New York Trade School Exhibit of Students' Work.

Mobile, Ala., was on Monday swept by a destructive storm, which raged over the whole of Southern Alabama. The business part of the city was reported as being 4 feet under water, several lives were lost and great damage to property was done.

The consideration of rapid transit proposals for the city of New York can only be compared in its slowness to the inaction of Senators at Washington on the Repeal bill. A decision in both cases is being loudly called for, while those who have the matter in hand go on their tardy way impassively.

Renting Gas Stoves.

The following, from the London *Gas World*, gives an idea of the financial side of the system of renting gas stoves as followed in England. These figures will be of practical value to managers of works where the system of hiring is in contemplation. They have been kindly supplied by W. R. Chester of Nottingham:

Some statistics as to the purchase, hire and cost of maintenance of gas cooking stoves in Nottingham.

The average net cost of 1511 stoves purchased is £4. 0/3 each.

The basis upon which the rental is fixed is as follows: 10 per cent. is deducted from the list price, and the rental is 10 per cent. on the balance. For example, a stove costs £5, or 100 shillings; 10 per cent. off equals 90 shillings; 10 per cent. on 90 shillings equals 9 shillings per annum, or 2 shillings 3 pence per quarter. This is about 13½ per cent. on the net cost.

The average period for which a stove remains fixed is five years. The average cost of fixing, which is all done free of cost to the consumer, providing he rents a stove for a whole year, and not more than 30 feet of pipe are required for fixing, is 6 shillings 6 pence per stove. The average cost of removing, cleaning and repairing is 6 shillings 6 pence per stove.

The actual rent received for 1511 stoves on hire is £684, or 9 shillings per annum each. The average charge on each stove in use is as follows:

	s.	d.
Cost of fixing, one-fifth of 6 shillings 4 pence	1	3.0
Removing, cleaning and repairing.	1	10.7
Refixing repaired stoves	0	4.4
Inspection and attendance on complaints	1	5.3
Proportion of showroom expenses.	1	4.6
Total annual charge per stove in use	6	4

The excess of rental over expenses is 2 shillings 8 pence per stove per annum.

In ten years only five stoves have had to be renewed. The net rental at present received—2 shillings 8 pence per annum—will, at 5 per cent. compound interest, provide a renewal fund to replace all the stoves once in 18½ years. The life of a stove, based on 10 years' experience, will not be less than 18 or 20 years, and therefore the present rental charged will be sufficient to provide against any actual loss on the business, and the profit on the gas consumed is consequently clear gain.

The average increase in the consumption of gas, where 385 stoves have been fixed, is 15,438 cubic feet per stove for the first clear year. The gas used for cooking purposes gives an increase to the former consumption of about 4 per cent.

Mr. Ransome, Warrington, said that stoves were not let out in Manchester free of cost, but small boiling rings were given away free and were also fitted free in that city.

THE RETAIL STORE.

A New Lamp Stove.

The Dietz Steel Fountain No. 1 is a new lamp stove, patented May 25, 1893, and now being put on the market by the R. E. Dietz Company, 60 Laight street, New York. The tank is of tinned steel stamped in two parts, joined together and soldered securely in the center. It rests in a cast iron fretwork base to which it is fastened. To the tank is secured a screw top for supplying oil and a 4-inch wick tube or burner. This latter is so constructed as to be easily cleaned and to regulate the air currents that pass to the flame.

A New Lamp Stove.—Fig. 1.—One-Burner Stove.

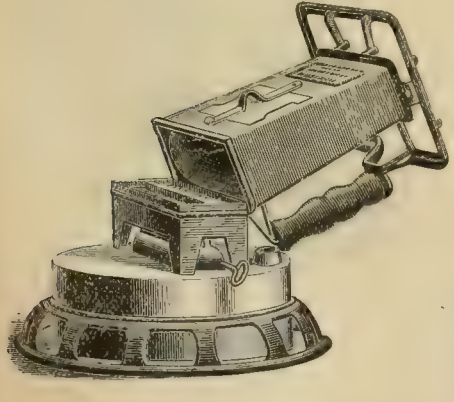


Fig. 2.—One-Burner Stove Open.

It is said that these stoves have been kept burning for hours without unduly heating the tank, and also that the tank does not sweat and become greasy. Firmly hinged to the burner is the chimney, which contains mica windows for illumination, and at the top is a cast iron frame for supporting whatever is to be heated. The chimney and burner are made of steel plate heavily coated with tin and stamped in one piece. They are light in weight, though superior workmanship and construction present much to attract the buyer. The illustrations show in Fig. 1 a one-burner stove ready for use, in Fig. 2 open for cleaning, lighting or trimming the wick, while the two-burner stove is shown open for the same purpose in Fig. 3. When closed for use a substantial catch prevents the possibility of their being opened until the catch is released.

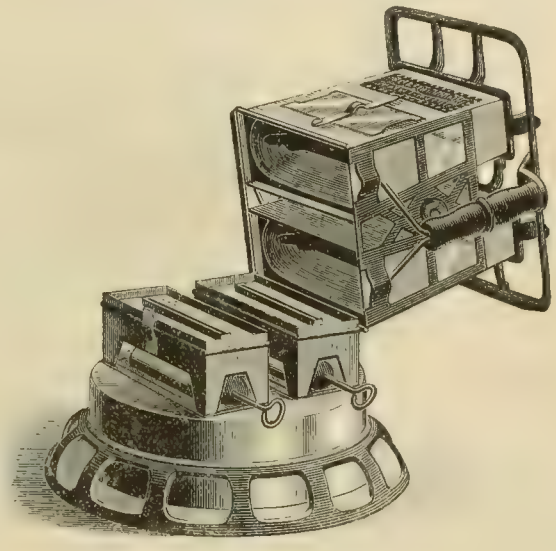
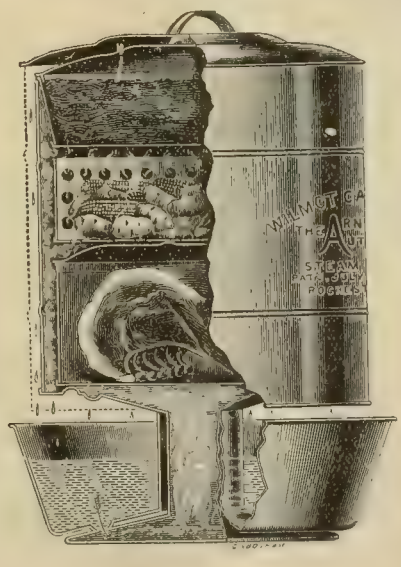


Fig. 3.—Two-Burner Stove Open.

Arnold Automatic Steam Cooker.

The accompanying illustration shows a broken view of the Arnold automatic steam cooker, made by Wilmot Castle & Co. of Rochester, N. Y. Cooking with this device is done entirely by steam, which is generated very rapidly in the small tin vessel under the pan, the pan being simply a reservoir to keep the steam generator supplied with water as it boils away. The steam passes up the tube into the cooking drum. In this drum tight kettles are placed and completely surrounded by live steam so that all foods are cooked without exposure to air, water or steam, preserving, it is claimed, all the flavors and juices, and obtaining the best possible results. With the perforated steamer several kinds of vegetables, it is said, can be cooked at once without the flavor of one affecting the others. The steam, as shown in the illustration, is caught by a receiver, is condensed and drips back again to supply of the reservoir, to be used over again. A special point is made that with the cooker no attention or care is required, as the food cannot be overcooked.



Arnold Automatic Steam Cooker.

Bronson Supply Company, 72 Beekman street, New York, have just arranged to market the entire product of the Ideal Mfg. Company, Philadelphia, Pa. The goods of this company are largely of brass and brass nickeled, among which are some 30 patterns of umbrella stands of about 24 x 8 inches in dimensions, 40 styles and kinds of cuspidors and spittoons, coal hods, &c. The Bronson Supply Company are about issuing a circular letter to the trade announcing the acquisition of this new line of goods.

Ball-Bearing Wringer.

The accompanying illustrations represent a ball-bearing wringer put on the market by the Peerless Mfg. Company, Cleveland, Ohio. The ball bearings are shown in Fig. 2, and their arrangement is described as follows: Four ball-bearing cones are placed in the wood frame, the cones having a perpendicular movement but are horizontally held firm, on the inside by a projection in the frame and on the outside by adjustable cones screwed on to the shaft, which also take up all wear that

might occur to the cones or bearing cases. The cones, it is stated, fit snugly inside the bearing cases, and the cases themselves are close down to the main shaft; also that a drop of oil applied to each bearing either before or just after using the machine is all that is required to keep the bearings in proper condition. The cones and bearing cases are referred to as being of steel, hardened and tempered, and the balls as bicycle balls manufactured by the Simonds Rolling Machine Company. The manufacturers claim that the wringer will do the work with little labor and with little wear and tear, and that it runs so easily a child can operate it. The wringer has a steel spring, malleable iron clamps and other features which, it is remarked, are new and valuable.

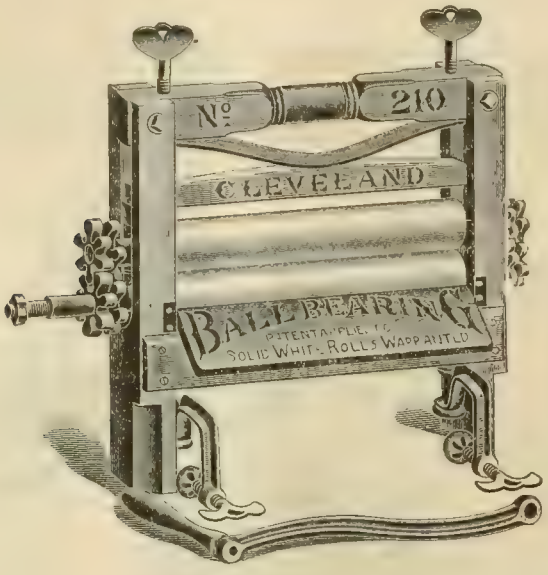


Fig. 1.—Ball-Bearing Wringer.

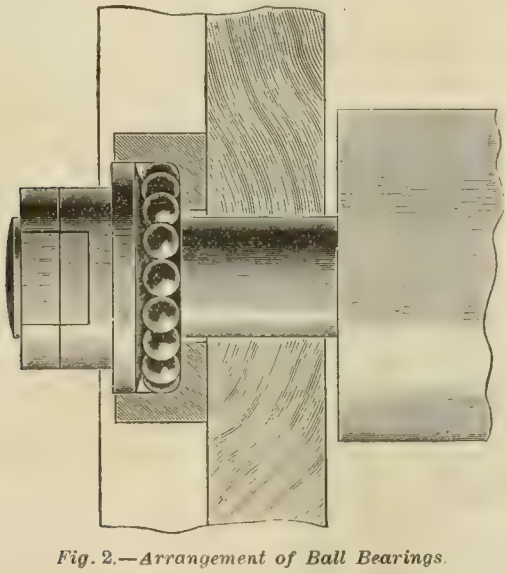


Fig. 2.—Arrangement of Ball Bearings.

A MINIATURE Never-Break steel spider is being sent out with the compliments of the Bronson Supply Company, Cleveland and New York, to the trade. This useful little addition to the desk furniture of an office will serve to remind their friends of the ever increasing demand for these goods. They have sent these little articles out very generally, but if any dealers in the trade have been omitted, they will be very glad to forward them the spider, if desired.

Selling to Consumers.

A letter from a well-known Hardware dealer in one of the larger Indiana towns gives the writer's reasons for not buying goods of manufacturers who sell to consumers. As the trade have the question prominently before them at this time, the following will be of peculiar interest:

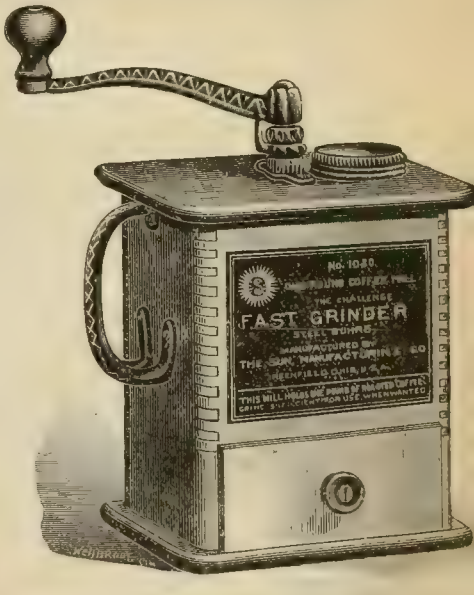
When I came to this city nine years ago I assumed charge of the Stove department of this business. I was very favorably inclined toward a certain line of Stoves, having used one of this make in Minnesota. These Stoves were not handled by any retail dealer in this city. Some two or three weeks after I came here a gentleman came into the store and requested me to send for repairs for a Stove of the make which I was thinking of putting in, and remarked that he got that Stove at wholesale price, as it was not sold at retail in our town, and that the manufacturers said, as they had no agent here, that they would sell him anything in their line at wholesale prices. A few days later another party came in for repairs and said that the gentleman for whom I had ordered the other ones had sent him in, saying at the same time that he also got his Stove at wholesale. I made no remarks to these parties, but I made a mental resolution to the effect that it would be very poor policy for me to handle a line of goods at retail upon which people knew the wholesale prices, and that fall, instead of buying this line, I bought over $6000 worth of Stoves from another house, and mind you that the goods which I purchased were not any more desirable than the line which I was formerly in favor of handling.

Retailers with remarkable unanimity are disposed to condemn the practice of manufacturers selling direct to consumers, and to a good extent are in favor of organization to overcome the difficulty. Our correspondent, referring to this part of the subject, remarks:

I think that it is a wrong business principle for a manufacturer or jobber to sell goods direct to consumers because they do not happen to have a retail dealer in that particular town handling their line. I think that an association formed of the best retail trade, which will pledge itself, so far as possible, to discriminate in favor of those manufacturers and jobbers who confine themselves to the legitimate channels of trade, will accomplish a great good.

No. 1085 Receptacle Mill.

The accompanying cut represents No. 1085 coffee mill, being introduced by the Sun Mfg. Company, Greenfield, Ohio. The mill has a hardwood box with rounded corners, finished with three coats of varnish. It is provided with an air tight canister with screw can top, holding 1 pound of coffee, which can be ground out in quantities as required. The box is mounted with lacquered copper bronze trimmings. The rapid grinding buhrs are made of steel alloy, a metal, it is stated, which will last a lifetime and which will crush gravel without leaving a scratch.

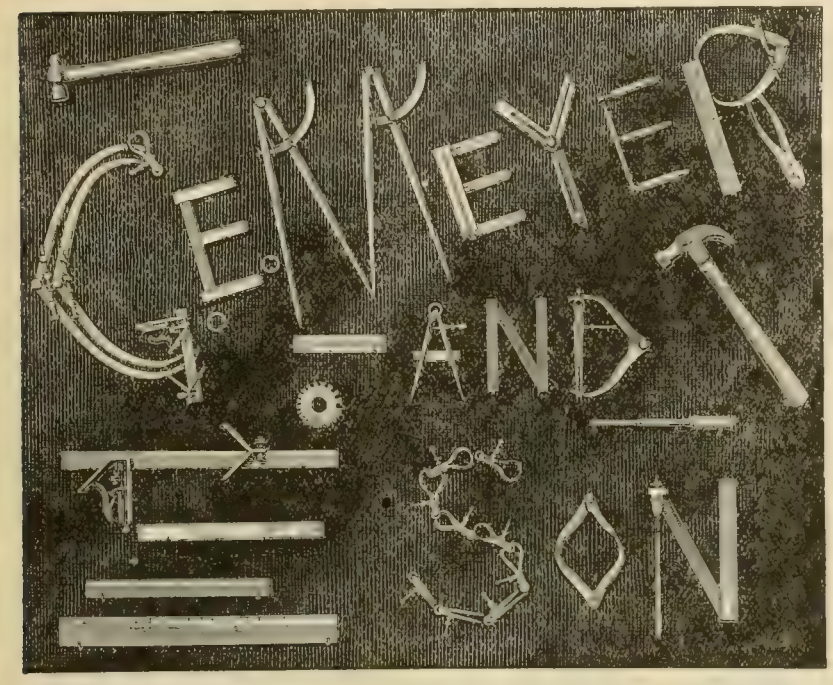


No. 1085 Receptacle Mill.

PEERLESS FREEZER COMPANY, Cincinnati, Ohio, have appointed J. C. McCarty & Co., 97 Chambers street, New York, general sales agents, who will be prepared to name the best factory prices at all times. J. C. McCarty & Co. have a full line of samples of these goods and purpose carrying a stock for the convenience of the trade.

G. E. Meyer & Son's Window Display.

The accompanying window display is reproduced from a photograph, for which we are indebted to G. E. Meyer & Son, South Bend, Ind. The card was arranged on boards covered with cloth, and served the double purpose of calling the attention of customers and passers-by to the fact that the firm handle a fine line of Machinists' and Mechanics' Tools, while it associates the keeping of these goods in the observer's mind with the name of this particular firm. A noticeable feature in the arrangement is the ingenuity and good judgment shown in the selection and placing of the tools, thus displaying the name to the best advantage; for which work W. C. Henry, one of the firm's salesmen, deserves great credit.



G. E. Meyer & Son's Window Display.

Jones' Nail Keg Holder.

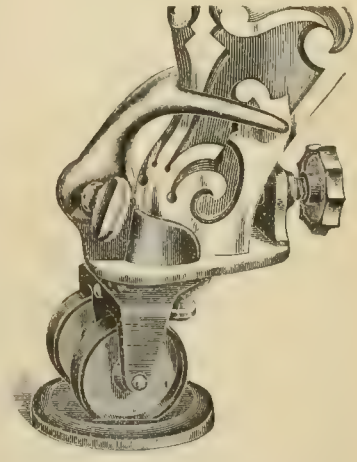
The Orophelian Mfg. Co, Petaluma, Cal., are introducing the nail-keg holder shown in Figs. 1 and 2. The holder is referred to as being made of first-class material, and as strong and durable. In putting a keg into the holder the holder is tipped down in front and the keg put in place, after which the head is knocked in, making a nail bin out of the keg. When nails are required the holder is tipped forward with the scoop under the front of the keg and the nails drawn out with the nail claw. It is claimed that by the use of the holder no nails are left on the floor, hands are not injured in filling a bin, and that time and money are saved, as well as annoyance.

Fig. 1.—Jones' Nail-Keg Holder.

Fig. 2.—Keg in Holder.

Morrow's Adjustable Stove Casters.

Z. D. Morrow & Co., 55 West Washington street, Chicago, are manufacturing adjustable stove casters, as shown in the accompanying illustration. These casters are made of the best gray iron, have no parts to break or get out of order, and are finished in copper and nickel plate. The caster has a base plate, a set screw, with bar touching at either side, forming a clamp, and an adjustable brace which fastens to a lug on the base plate with a bolt, and burr that tightens when the screw comes against the plate from the rear. A circular plate for the floor, with holes to receive the caster wheels, holds the stove steady and secure. The device is simple, neat, durable and economical, and the manufacturers are having a heavy demand for the goods.



Morrow's Adjustable Stove Casters.

Electric ambulances are to be introduced by the city authorities of St. Louis, the various street railways of the city having consented to allow them the free use of their tracks.

STOVE TRADE NOTES.

Mrs. M. E. Strobel.

Last June the announcement was made to the trade through *The Metal Worker* that the stove house of H. Rendtorff & Co., of 16 Lake street, Chicago, had secured the services of a lady as commercial traveler. Manager T. F. Hull of that house was requested to furnish us with a photograph of her for reproduction in our columns, but not until very recently was he able to secure it on account of the modesty of the fair commercial traveler, who shrank from cultivating newspaper publicity. It is with much pleasure that we present to our readers with this sketch a portrait of the first lady engaged in the business of traveling to sell stoves—Mrs. M. E. Strobel, wife of A. F. Strobel of Keokuk, Iowa. Mrs. Strobel is not new to the stove business. In 1858 she and her husband bought a stove foundry in Keokuck, ran it successfully for several years and sold it to Comstock Brothers. They then built the Central Stove Works. At times they found it necessary to acquire and conduct hardware and stove stores in several towns. With he exception of but four years in this long period Mrs. Strobel was actively connected with the stove business. For 15 years she was buyer for A. F. Strobel, while he conducted a large hardware and stove store in Keokuk, making frequent trips to jobbing and manufacturing towns and cities for the purchase of stock. In knowledge of the stove business and the special features of a stove she claims that no salesman surpasses her, which, with the known gallantry of the gentlemen in the trade, they will probably not dispute. Her experience in traveling has also given her special fitness for this new vocation. She has not an easy section to travel over. Her territory comprises Kansas and Nebraska, which are not as thickly populated as the older States. Yet she has visited as high as five towns in one day, wasting no time, taking passage on freight trains when better facilities were not to be had, or hiring teams and driving across prairies. Her husband is at present engaged as a traveling salesman by F. & L. Kahn & Bro. of Hamilton, Ohio, and by a curious freak of fortune also canvasses the trade in Nebraska, coming often in sharp competition with his own wife. Another member of Mrs. Strobel's family, B. A. Williams, travels in Iowa for H. Rendtorff & Co.

Mrs. Strobel is known throughout her territory as "the stove woman." She is of French Huguenot extraction, and possesses all the vivacity of that race. She is of medium hight, has an abundance of brown hair covering a shapely head, and dark gray eyes with a merry twinkle, while her features are almost classically regular. She is a fluent talker and has a persuasive manner which will doubtless count heavily in favor of the house employing her as soon as the times are more propitious and merchants feel safe in laying in stocks of stoves. She is now making a trip through her territory, calling on the trade.

MRS. M. E. STROBEL.

Laura Nevins Range & Heating Company

of St. Paul, Minn., have a practical exhibit, in Section D, of the Boiler Extension, Machinery Hall, World's Fair, consisting of one of their ranges in regular operation. This construction has a down draft, as has been previously explained to our readers, and is suited to any kind of fuel. As a heater it has several points of interest. Cold air received from the floor is passed through a 7-inch passage around two spacious ovens and comes out through a hot air discharge pipe. At the test made last week by one of the judges of awards, cold water boiled four minutes after starting a fire and a full meat breakfast was ready in 24 minutes. The stove is made in two sizes, is handsome in appearance and substantial in construction. In addition to the above exhibit the company also have a range in the Pennsylvania cooking school, near the Forestry Building, and a booth in Section O of the Manufactures Building.

From the Michigan Stove Company a neat memorandum book has been received the past week, which is a sample of those now being distributed by their agents throughout the country. It is of vest pocket size and contains a blank space for an identification record.

Future of the Hot Air Furnace.

By A. W. Glessner,

President of the Excelsior Steel Furnace Company.

FORCING SALES.

Complaint is frequently made by the adversaries of hot air heating of the methods employed by furnace makers and dealers is forcing sales It is claimed that excessively long time is offered by furnacemen as an inducement to adopt this form of heating. It is said that in many parts of the country furnaces are put in during the spring and summer months, and one-half of the purchase price is made payable on the 1st of the following January. This is certainly long time and in many lines of trade would be considered poor business policy on the part of both buyer and seller, but in the furnace business there are reasons to justify the time given. In the first place, by giving time on part of the contract price an opportunity is given to the buyer to test the furnace before completing the payment, which in itself inspires confidence on the part of the buyer in the heater, as in any event the great risk is that of the seller. Again, furnaces are going more and more into the homes of the middle classes, who have not at all times the funds wherewith to pay the cost of the apparatus complete, but who, if given a few months' time, could raise the required sum. It is astonishing the amount of money paid out monthly in cities for furniture, sewing machines and household goods on the installment plan, which otherwise would not be bought, and it is the rule that these payments are promptly met. It is undoubtedly a fact that the sales of furnaces have been largely increased by the giving of time by the furnace contractor and he has been enabled to do this by the aid of the furnace maker who has dated ahead purchases made during the early months of the year.

ADVANTAGES TO THE DEALER.

An advantage to the dealer is in getting a fair share of his furnace work done during the dull months and in advance of the fall rush, and he can thus give to the work closer attention than if done later in the season. One dealer who has followed the plan of giving time on furnaces stated to me recently that in some years he had had fully 90 per cent. of the deferred payments in his hands by December 15, or as soon as the buyers were satisfied with the furnaces.

In my opinion time should not be given by maker or dealer except in cases indicated above where trade can be ob-

tained in no other way, and it would be better to offer to buyers the temptation and inducement of a cash discount on work done early in the season, and this would be taken advantage of by a few buyers certainly, and it would be worth the discount to the dealer to get the accounts closed. Work done during the summer months costs the dealer less and he can afford to share this saving with the early buyer.

TREATMENT OF CUSTOMERS.

Furnace makers in the past have treated their customers liberally and have often sent their best salesmen long distances to aid agents in effecting sales, and in many cases the attending sales have come far short of the expenses incurred, but the manufacturer has in mind the welfare of his goods and looks to the future as well as to the present for his profits. Each furnace that does good work is advertising both maker and seller, and future sales are a certainty. The growing demand for furnaces is due very largely to the increasing desire throughout the country for "creature comforts," under which head a good furnace surely comes.

Forcing sales by cutting prices and then slighting the work is poor policy, but any legitimate methods of swelling the total sales of furnaces throughout the country should be heartily approved of.

Another thing which the furnace dealer should not overlook is that if he loses a job to a competitor who does good work, the cause of good heating is thereby advanced in that town, and each good job makes it easier to effect other sales by the dealer, whereas poor work by one dealer in a town makes it uphill work for the dealers who are handling good articles and doing good work.

(*To be continued.*)

A Golden Wedding.

Mr. and Mrs. William P. Abendroth of Portchester, N. Y., celebrated last week, at their home at Echo Hill, the fiftieth anniversary of their wedding. A large number of friends were present to congratulate them upon the completion of 50 years of married life, and many who were unable to be present sent letters of congratulation. The parlors of the house were beautifully decorated with ferns, autumn leaves, golden rod and potted plants, Mr. and Mrs. Abendroth receiving their guests standing beneath a canopy of vines with a background of palms. The couple were also the recipients of many handsome presents from friends in different parts of the country. Mr. and Mrs. Abendroth were married on October 2, 1843, and have five children, nine grandchildren and three great grandchildren, all of whom were present at the celebration. Among the guests may be mentioned Mr. and Mrs. John B. Fraser and daughters, Jersey City, N. J.; Mr. and Mrs. Mulford Valentine, Woodbridge, N. J.; Mr. and Mrs. George H. Lary, Mr. and Mrs. Jordan L Mott, Mr. and Mrs. John H. Keyser, Mr. and Mrs. Salmon W. Hoyt and daughter, and David Close of New York; Mr. and Mrs. Frank A. Abendroth, Chicago, Ill.; Mr. and Mrs. John F. Mills, Mr. and Mrs. F. J. Marshall, S. K. Satterlee, William Ryan, and Mr. and Mrs. A. D. Phelps, also of New York City; Mr. and Mrs. M. P. Blauvelt of Jersey City; Mr. and Mrs. J. Dykman of White Plains; Horace B. Newton and Gen. John C. Rathbone of Albany; Robert Bruce of Greenwich, Conn; General Samuel H. Johnson, Archdeacon Kirby and Mr. and Mrs. R. F. Downing of Rye; Mr. and Mrs. Martin Keogh of New Rochelle, and Mr. and Mrs. Samuel Meeken of Brooklyn.

Estate of P. D. Beckwith.

"Round Oak Stoves, Dowagiac, Mich.," is the inscription in old gold letters upon a crimson background, constituting the side title of a little pamphlet of 30 pages issued by the Estate of P. D. Beckwith of the place named. The printing is on a good quality of paper, the edges of the pages are finished in light yellow, while the binding is in stiff boards. The frontispiece is an excellent likeness of the late Mr. Beckwith, following which is an announcement to the trade. Attention is called to the fact that for more than 20 years Round Oak stoves have been a specialty of the manufacturers, and no pains nor expense have been spared to attain a high standard of excellence. From a few workmen and a small amount of material in 1871, this business has steadily grown in proportions until at the present day an extensive plant is required, giving employment to 300 men and melting over 30 tons of pig iron daily the year round. The makers state that the leading feature of their goods is their adaptation to all kinds of fuel. By a change of inside fixtures each stove will burn soft or hard coal, coke or wood, thus fitting it for all seasons and all localities. The Round Oak stove is fully described in the catalogue before us, its special features being emphasized in a way to interest the dealer. Numerous varieties are illustrated and a price-list is given of extra parts. At the close reference is made to the circular letter issued to customers under date of September 10, 1891, a perusal of which is likely to interest agents of Round Oak stoves wherever located.

ODD PLATES.

TERSTEGGE, GOHMANN & Co. resumed operations in all departments of their extensive works at New Albany, Ind., on Monday, September 25. A large force of workmen are employed and the company consider the outlook encouraging.

A PRESS DISPATCH from Kokomo, Ind., bearing date of September 29, states that the William G. Fischer Safe & Range Company of that place have made an assignment, with liabilities of $40,000 and assets about the same.

BELLAIRE STOVE COMPANY of Bellaire, Ohio, have recently established a branch salesroom at Martin's Ferry, for the purpose of facilitating the distribution of their product.

THE CHICAGO & ERIE STOVE COMPANY of Erie, Pa., are directing the attention of the trade to their lines of hard coal base burners provided with ovens. These goods were new last season and have been thoroughly tested in practice, so that the manufacturers are confident of their satisfactory operation. In some localities the base burners are in great demand and the company look forward to a good season's business.

ROBERT SCHUELER & Co., 615 Ogden avenue, Chicago, have brought out a line of gas heating stoves under the name American. Their catalogue, which has just been issued, comprises 12 pages of illustrations and descriptions. The stoves shown are handsome in appearance and are stated to secure the best results at a minimum cost for fuel. The line comprises square and cylindrical stoves, in eight styles and sizes. They are made with copper reflectors and asbestos flame plates burning a blue flame, or with highly polished copper reflectors and illuminating flame. Gas stove supplies are also furnished to the trade.

ONE OF THE ENTERPRISING STOVE CONCERNS in the West is Kiechle, Brentano & Oberdorfer, proprietors of the Southern Stove Works, at Evansville, Ind. Their goods are in active demand from all sections, and some large shipments have recently been made. Probably that which may be considered the most noteworthy was forwarded not long ago from Howell by special freight to Texas. The train consisted of 18 cars, filled to their utmost capacity with ranges, cook stoves and heaters. On telegraphic orders five carloads were forwarded a few days previous to this one, which was made about the middle of September, and was followed by ten additional carloads shortly after the special train started. The combined weight of the contents of the 18 cars was 462,300 pounds, and the freight bill was $3107.25. The issue of the Evansville *Tribune* of September 13 contains an interesting history of the Southern Stove Works and refers at some length to this shipment of stoves. In the course of the article the statement is made, for the purpose of showing the extent of the business of the concern, that one of the traveling salesman, Charles R. McAdam, sold 85 carloads of stoves on one trip through Texas, and that six other traveling salesmen cover the Southern, Northern, Southwestern and Western States. The business of the Southern Stove Works was established in 1867 by Hebling & Co., which concern was succeeded by Browneller, Grayville & Co., and then by Browneller, Kiechle & Grayville. The foundry proper now occupied by the Southern Stove Works is said to be the oldest plant in the State and was rebuilt and enlarged in 1886. The article in the *Tribune* also gives a brief biography of the members of the firm, and refers to the force of hands employed.

ONE OF THE EXHIBITS at the Western New York Fair, recently held in Rochester, N. Y., was that of Levi Hey & Co., who displayed in Stove Hall a number of specimens of Splendid goods made by the Fuller & Warren Company of Troy, N. Y. The exhibit was made up of ranges and heaters, and was the subject of no little interest on the part of attending visitors.

ACCORDING to a recent issue of a local paper the Central Stove Works of Lebanon, Pa., are doing a good business and are actively engaged in all departments. They have a gratifying number of orders on hand and consider the outlook for the near future at least very promising. Among their recent shipments were two carloads of ranges and heaters to Philadelphia.

THE WOOLDRIDGE STOVE COMPANY of Memphis, Tenn., resumed operations a few days ago owing to increasing orders for their product, and they consider the outlook for autumn and winter encouraging for a fair volume of trade.

THE SUPERIOR FURNACE COMPANY of Little Falls, N. Y., send us a copy of an illustrated pamphlet of Superior furnaces and heaters for the season of 1893-94. Within its covers, which are lithographed in colors, attention is invited to combination hot water and

steam heaters adapted to warm dwellings, churches, hotels, public and private institutions, banks, stores, &c., and manufactured under United States patents. Various methods of heating are described, while timely suggestions are likely to interest those in need of heating apparatus. The Superior furnaces are very fully described, and illustrated by means of sectional views, while tables are presented giving dimensions and capacity of the various sizes. A chapter on the importance of ventilation is given, as well as directions for setting up Superior furnaces in portable form and also in brick work. A number of pages are devoted to testimonial letters showing what people who have used the Superior warm air furnaces have to say concerning their merits. The third page of the cover carries a general view of a row of ten houses on Ellis avenue, Chicago, heated with ten No. 52 Superior steel furnaces.

THE TWO CITY PLANTS of the Reading Stove Works, Reading, Pa., which were running only on partial time, were put into operation last week on full time, with more than 300 men at work. The foundry at Millmont, Pa., has not yet resumed operations

THE SOMERSWORTH MACHINE COMPANY of Dover, N. H., are distributing an advertising novelty in the shape of a 15-inch wooden rule finished with a metal edge. The name and address of the company appear in large black letters upon the side carrying the marks dividing the rule into inches, while on the other side is a list of some of the stoves, ranges and heaters manufactured by the company. The statement is also made that the company turn out box and cylinder stoves, lawn vases, bouquet holders, sinks, hollow ware, spiders, ash and boiler mouths, funnel thimbles, &c. The rule is a useful article to have about the desk or shop, and dealers receiving samples are likely to have them within convenient reach. By this device the company will also keep their name and address constantly before the attention of the trade.

R. E. DIETZ COMPANY, 60 Laight street, New York, find their oil heaters in popular demand at this season of the year. They are made in three styles—fire place heater, No. 4 radiator and parlor heater, all of which give a brilliant illumination as well as strong heat.

THE DETROIT STOVE WORKS, Detroit, Mich., send us illustrated circulars of the Imperial Jewel square base burning parlor stove, which they are offering the trade in three sizes. This is a handsome heater, with ample mica illumination and full nickel trimmings. The more important features include duplex grate combined with shaking ring, solid rotating fire pot, gas cover under swing top, working automatically, large ash pan, hot air ventilating flue and tea kettle attachment. The manufacturers refer to this heater as the highest example of modern stove construction and as being distinctive and original in design.

THE J. L. MOTT IRON WORKS of New York and Chicago have issued some interesting publications in the shape of two pamphlets, one illustrating laundry ranges and iron heaters, while the other calls attention to Mott's combined furnaces and caldrons for coal or wood. The former work shows an interesting assortment of stoves intended for heating sad irons of various descriptions, some having a capacity for heating as many as 30 irons. The Scorcher heater for heating open or circulating boilers is also illustrated and described, as is likewise Mott's Sunray water heater, made in four sizes. Prices of coils of wrought iron piping with ground-in brass couplings fitted to laundry stoves constitute a feature of the pamphlet. The assortment of furnaces and caldrons illustrated and described in the second pamphlet is a varied one, and in connection with the tables of measurements and capacities is likely to prove interesting to dealers handling this class of goods. Two pages are devoted to illustrations and descriptive text relative to flue linings and the manner in which they are built in.

THE DANGLER STOVE & MFG. COMPANY, Cleveland, Ohio, announce that they have solved the difficult problem of vaporizing gasoline fluid in a generating burner without the inconvenient and unsightly elevated tank. This is claimed to be accomplished by a new device in their New Delight burner. The design is referred to as being unique, handsome and convenient, and as "one of the most wonderful inventions in the line of vapor stoves of the age."

DE HAVEN & CO., Limited, Pittsburgh, Pa., are directing the attention of the trade to their new parlor stove, which they have termed the Perfect Cinderella Franklin. This stove is described as a new and beautiful open front parlor stove of superior merit, containing a number of new and novel features, among which are the patent automatic blower and draw center basket grate. The stove is fully embellished with nickel and tile, and the design is of the latest and most approved style. It is made in three sizes, numbers 12, 14 and 16, and the firm confidently expect a large trade in this stove, for which they have already received numerous orders.

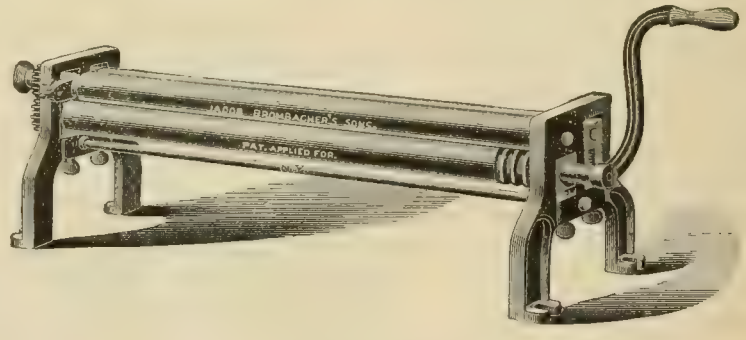
ON THURSDAY MORNING sheriff John J. Gorman held a sale at 92 Beekman street, New York, to dispose of the stock and goods of the Richardson & Morgan Company. This method of rearranging their business was resorted to as the most satisfactory to some of those interested. The entire stock of stoves, ranges, furnaces, steam and hot-water goods and repairs were bought in for the house, and business was resumed immediately after the sale. A renewed energy will be devoted to bringing some of the new things they have to the notice of the trade.

C. H. BENNETT of Cincinnati, Ohio, has issued a pamphlet illustrating and describing his patent smokeless furnace, to which we called attention a short time since.

THE WESTERN STOVE MFG. COMPANY of St. Louis, Mo., have added to their assortment a new line of wrought steel ranges, which are known under the name Lady Jane. The goods are constructed with a view to economy, durability and general utility, and have large oven, asbestos lined flues, swing feed door, scuttle ash pan and drop oven door. A high warming closet is a special feature of the Lady Jane, the front swinging back and allowing full surface for warming dishes. The water coils used have been thoroughly tested and are claimed to be satisfactory in every particular. Several varieties of the Lady Jane have been brought out and are illustrated by means of a circular which the company have just issued. The makers are also directing attention to an odd shaped construction known as the Rattler. It is made in two sizes and is adapted for heating halls, stores, churches, warehouses and the like.

New Slip Roll Former.

The accompanying cut represents a new slip roll former which Jacob Brombacher's Sons, 30 Cliff street, New York, have brought out, and patent for which has been applied for. The



New Slip Roll Former.

distinctive features of this former are that the boxes rest on the ends of adjusting screws instead of hanging on to the thumb screws, which, it is pointed out, avoids the breaking of the thumb screws, and also makes boxes more easily adjusted. In this former the object of the slip roll former is obtained by pushing up the thumb piece at the left of the roller, which permits the sliding of the roller to the left sufficiently to lift it out of the journal and slide off the work. At the same time the gears are so arranged that in performing this operation they cannot become detached from one another. By this construction it is claimed that all the benefit of a slip roll former is obtained, with, at the same time, all the rigidity of an ordinary former, as this form of operation permits of a solid frame at both ends.

The machine is simple in construction, and the adjusting screws are protected from injury by being placed between legs. Both frames, it will be observed, are cast with open lugs which permit of the rapid insertion of the bolts necessary to hold the former to the bench. The rollers on this machine are made of cold rolled steel and the gears are cut out of the solid metal.

All parts of the machine are made on the duplicate part process and interchangeable parts can be obtained at any time. Jacob Brombacher's Sons are making this machine at present in the following sizes: 1¾ inches and 2 inches diameter, 30¾ inches long; and 1½ inches diameter, 16 and 20 inches long.

TRADE REPORT.

The Iron Market.

The feeling of discouragement is speading in the Iron trade. An increasing number of manufacturers and merchants are shaping their business on the conviction that the balance of the year will not bring out enough business to give mills and furnaces adequate employment and thus lay the foundation for a recovery in prices.

The great majority of the rolling mills throughout the country who are attempting to run are working spasmodically. This means relatively high cost of production, which they aim to correct by securing more work. So many are trying that plan now that prices are in the demoralized condition characteristic of nearly all the markets. Too many makers have been too sanguine and are now paying the penalty for what seemed to be some weeks since a justifiable view of the situation.

A good many men in the Iron trade have been inclined to charge the delay in the repeal of the Silver bill with the greater part of the responsibility for the depression. Their views seem to be undergoing a change. We often hear the opinion expressed now that little improvement will follow even a straight out repeal. Even if that opinion is incorrect it will take an accumulation of evidence before it is abandoned. That, again, means delay in the return to confidence and to buying in the Iron trade.

During the week there have been no reports of offerings of material by those who had made advances on it, so that that disturbing element which has been most conspicuous in the Pig Iron trade is now absent. Instead, there are indications, notably in Chicago and Cincinnati, that consumers have so far cleaned up their stocks that they are forced to become more liberal purchasers.

Pig Iron.—The market in New York is very dull and continues irregular, occasional low offerings being made, notably by Virginia furnaces. There has been some talk this week of the formation of a syndicate to take over 15,000 tons of bankers' Iron. We quote Northern brands $14 @ $15 for No. 1; $13 @ $14.25 for No. 2, at tidewater. Southern Iron, same delivery, $13.25 @ $14.25 for No. 1; $12.25 @ $13.25 for No. 2; $11.50 @ $12.25 for No. 3; $11.75 @ $12.25 for No. 2 Soft, and $12.25 @ $12.50 for No. 1 Soft.

In the Philadelphia district the movement in Pig Iron is very slow, low prices being no inducement to those who are not in need of material. The output is supposed to be in fairly close proportion to consumption, but the accumulations of earlier months are an insurmountable barrier to an improving market, so that until these are absorbed prices are likely to remain weak and unsettled. The demand is confined to small lots at about the following range of prices, but on large lots or forced sales concessions can be had according to the circumstances in each particular case. $12.25 @ $12.75, delivered, for Plain No. 2; $13.75 @ $14 for No. 2x; $14.25 @ $14.50 for No. 1x.

From the Chicago market the inquiry is reported as fair, and while sales are generally of small quantities there is an occasional transaction of good size. One order was placed for 1500 tons of Southern Coke for scattered deliveries and there are rumors of a much larger deal. Instructions are being received to resume shipments on old contracts. The revival in demand now experienced appers to be due generally to the complete cleaning up of stocks of Pig Iron at foundries and not so much to any special improvement in the business of the foundries themselves. The stocks at furnaces are being drawn on so steadily that a decided decrease is expected to be shown at the close of this month. Inquiries for Charcoal Iron are in the market, but not for large quantities. Prices show no change. Quotations are now as follows for cash:

Lake Superior Charcoal	$16.00 @ $16.50
Local Coke Foundry, No. 1	13.50 @ 14.00
Local Coke Foundry, No. 2	12.75 @ 13.00
Local Coke Foundry, No. 3	12.50 @ 12.75
Local Scotch	14.0 @ 14.50
Ohio Strong Softeners No. 1	15.50 @ 16.00
Southern Silvery, No. 1	@ 14.50
Southern Silvery, No. 2	@ 14.00
Southern Coke, No. 2	12.35 @ 12.60
Southern Coke, No. 3	11 60 @ 11.85
Southern, No. 1, Soft	12.35 @ 12.60
Southern, No. 2, Soft	11.85 @ 12.10
Tennessee Charcoal, No. 1	16.00 @ 16.50
Alabama Car Wheel	18.50 @ 18.75
Hocking Valley, No. 1	15 25 @ 16.00
Jackson County Silvery	16.00 @ 17.00

Pittsburgh advices mention a very light demand for Pig Iron, which, it is thought, will be likely to remain light until there is a heavier demand for finished material. Buyers admit that now is a good time to buy Iron for future wants, but yet they do not place their orders. Quotations are given as follows:

No. 1 Foundry	12.75 @	13.00,	cash.
No. 2 Foundry	11.75 @	12.00	"
Charcoal Foundry No. 1	14.00 @	15 00	"
Charcoal Foundry No. 2	13.00 @	14.00	"

There appears to be a more confident undertone to the Southern Pig Iron markets; not that there are any large transactions at better prices, but there is less calamity Iron being forced to sale and the Southern furnaces have a voice in making prices, not leaving it entirely to buyers. There have been no large transactions during the week, but a moderate run of consumptive orders, ranging from single carloads up to 700-ton lots; 400 tons No. 2 Foundry and No. 1 Soft sold at $8.25, f.o.b. Birmingham, but it is understood that some No. 2 Foundry is yet obtainable at $8. In fact, there is nothing to warrant any change in quotations. There is more inquiry from stove works, and it is confidently predicted that liberal sales will be made to them in the early future, if the repeal of the Silver Purchase law goes through the Senate, for until this matter is out of the way there is no disposition to enter into any important business engagement. Quotations are as follows:

Foundry.

Southern Coke, No. 1	$12.75 @ $13.00
Southern Coke No. 2	10.75 @ 11.00
Southern Coke No. 3	10.25 @ 10.50
Ohio Soft Stone Coal, No. 1	15.50 @ 16.00
Ohio Soft Stone Coal, No. 2	14.50 @ 14.75
Lake Superior Coke No. 1	15.00 @ 15.25
Lake Superior Coke No. 2	14.00 @ 14.25
Hanging Rock Charcoal, No. 1	18.50 @ 19.00
Hanging Rock Charcoal, No. 2	17.50 @ 18.00
Tennessee Charcoal, No. 1	14.00 @ 14.25
Tennessee Charcoal, No. 2	13.00 @ 13.25

Car Wheel and Malleable Irons.

Standard Southern Car Wheel	17.75 @ 18.00
Lake Superior Car Wheel and Malleable	17.00 @ 17.25

Metal Market.

Pig Tin.—The price for Straits Tin for prompt delivery has been moved up to 21¢ ℔ lb. In remote instances a shade more was paid. Deliveries at sellers' option this month and the balance of the year advanced correspondingly. Purchases by jobbers and consumers have, according to most accounts, been very moderate, but official statistics make it read that the consumption last month was equal to that of July and August, and that spot stocks, exclusive of the Pacific Coast, have been reduced to 5155 tons, or, say, less than four months' estimated consumption. At the close the market was rather soft, with sellers at 21¢, cash, for prompt delivery, for lots of 10 tons and over. Data posted on the Metal Exchange affords the following comparison:

Shipments:	Sept. Tons.	Aug. Tons.	Juy. Tons.
Straits to Great Britain.	2,200	2,300	1,150
Straits to Continent Europe	1,100	1,900	1,200
Straits to United States.	150	None	None
Total from Straits	3,450	4,200	2,350
Australia to Great Britain	430	500	300
Australia to United States	None	None	None
Total from Australia	430	500	300
London to United States	60	None	None
Holland to United States	None	None	None
Total from Europe	60	None	None

Consumption:			
London deliveries	1,770	2,070	2,050
Holland deliveries	200	830	370
United States, excl. Pacific Coast	1,600	1,600	1,600
Total	3,570	4,500	4,020
Stocks:			
In London	2,500	1,891	2,022
In Holland	1,250	390	1,140
In United States, excl. Pacific Coast	5,155	6,710	8,310
Total close of month	8,905	8,991	11,472
Stocks afloat:			
For London	3,935	3,394	2,237
For Holland	1,080	1,280	1,220
For United States, excl. Pacific Coast	170	None	None
Total close of month.	5,185	4,574	3,457

	Oct. 1.	Sept.1.	Aug.1.
Total visible supply '93	14,090	13,565	14,929
Total visible supply '92	14,741	14,720	14,181

Copper.—The only change in the market for this metal is a somewhat higher level of speculative bids for Lake Superior Ingot. Whether it is significant or not remains to be seen. It is the fact, however, that those bids were not high enough to lead to business. Outside of what may be termed the speculative circle there has been no change whatever. Home consumers have purchased in a strictly perfunctory manner; export movement has been chiefly in delivery on old contracts and the offering has shown no sign of change on the part of sellers. In any event, 9¼¢ stands as strictly inside price, while 9⅞¢ @ 10¢ is generally quoted. The retail consumptive demand has been fair during the week, although hardly up to the expectations formed a few weeks ago. For small lots jobbers again quote 11¢ on Lake Ingot.

Sheet Copper.—Moderate sized orders for Cornice Copper, although hardly up to the volume of last week, keep business moving in this line. Otherwise there are no new features to note. Prices remain unchanged, as per list.

Pig Lead.—About 1000 tons of Common Domestic have changed hands during the past week, chiefly for October and November delivery. The terms were 3.70¢ @ 3.75¢ and about equal quantities went at respective prices. At present 3.70¢ is bid, and there are few, if any, sellers of round lots at less than 3 75¢ for any delivery during the balance of the year. While average prices are thus lower at the present time than they were a week ago, the market has gained somewhat in tone since the consummation of the contracts above referred to. Jobbers report the demand from consumers to be no heavier than that of last week, which was very meagre, and signs of softening in prices are not wanting.

Lead Pipe and Sheets.—No improvement in the market for this material has yet developed. Orders and inquiries in the retail trade are reported as unusually light, and there is an inclination to mark down prices in some quarters.

Spelter.—Single carloads of ordinary Western have been sold to a moderate extent at 3.80¢ for November and December delivery. Bids of 3.75¢ have been solicited for round lots, in the face of reported light supplies in first hands and comparatively small production at the present time. Eastern consumers are very indifferent buyers, however, and influenced little, if at all, by the reports from the primary sources of supply.

Tin Plates.—The market for Tin Plates is devoid of any distinctly new features. The demand for Coke Tins from Southern consumers, which caused quite a lively flutter for two or three weeks, has again fallen off, and the decline has not been counterbalanced by any special increase in requirements for other descriptions of Plates. While a fairly brisk jobbing trade has been experienced, and from some quarters a decided increase in inquiries is noted, the general run of business still keeps below the average for the season. Terne Plates are quiet, the major portion of consumers' requirements in this line having been filled. Such business as is going is almost wholly confined to spot orders for moderate amounts, and "futures" continue to be neglected. Shipments from abroad continue to be narrow, and are not likely to increase to any great extent while uncertainty exists as to the trend of tariff legislation. Naturally, there is some unevenness in prices, but no change of importance has taken place during the past week. Certain useful sizes of Coke stocks, which were depleted by the recent demands from Baltimore oyster packers and other canners, still continue scarce and command a slightly higher price. Stocks of all kinds of imported Plates in the hands of dealers are low, and consumers have taken little beyond the material required for their immediate needs, so that the Tin Plate market is in good shape for a brisk business when a revival does develop. A special cable dispatch to *The Iron Age*, dated October 4, gives the following report of the British Tin-Plate trade: For Tin Plate inquiries have been more numerous, but actual business was small, owing to the lowness of bids, except for Oil sizes. Large buyers of the latter have shown some disposition to stock up at present rates. There is also rather more business in the Ternes, but at low prices. Liverpool quotations are as follows:

IC Charcoal, Alloway grade	12/9 @ 13/3
IC Bessemer Steel, Coke finish	11/6 @ 11/9
IC Siemens " " "	11/9 @ 12/
IC Coke, B V. grade, 14 x 20	11/6 @ 11/9
Charcoal Terne, Dean grade	@ 11/6

W. H. JEFFERS, formerly of the firm of Jeffers & Kumberger, has opened a new office at 434 Canal street, New York, for the sale of the Backus Gas Engine. Mr. Jeffers had 20 years experience with the Otto Gas Engine, and is well equipped with machine shop and appliances to do gas engine work.

LACK of immediate orders has caused the American Sheet Mill at Phillipsburgh. N. J., to shut down.

Chicago Report.

Scrap.—Business shows signs of improvement, and dealers are offering more money to country collectors, as shown by the following list of buying prices, Chicago delivery:

	Per net ton.	Per lb
No. 1 Wrought Scrap	$8.00	....
Machinery Cast	7.00	....
Malleable Cast	6.00	....
Stove Plate (free of burnt)	5.00	....
Burnt Iron and Grate Bars	3.50	....
Sheet Iron and Hoops	2.00	....
Plow Steel and Breaking Stock	5.50	....
No. 2, such as Shovels, Hoes, &c	4.00	....
Old Boilers—whole (Iron)	4 00	....
" (Iron)—cut in single Sheets and Rings	6.00	....
Old Gas-Pipe and Boiler Tubes	5 00	....
Cast Borings	3 25	....
Turnings	4 00	....
Horseshoes	9.00	....
Copper Bottoms	....	5 ¢
Copper Clips and Heavy	....	7 ¢
Heavy Brass	....	5½¢
Light Brass	....	3½¢
Pipe Lead	....	2½¢
Tea Lead	....	2 ¢
Zinc	....	2 ¢
Rubber	....	2¼¢

Anthracite.—A heavy trade is in progress. Winter supplies are now being ordered very generally. Carload lots of 12 net tons or over are quoted as follows:

	Grate.	Egg, Sto. and Ch.
Chicago, Ill	$5.85	$6.10
Milwaukee, Wis	5.85	6.10
Kansas City, Mo	9.05	9.30
Council Bluffs, Iowa	9.05	9.30
Lincoln, Neb	9.20	9.45
Sioux City, Iowa	9.05	9.30
Aberdeen, S. Dak	9.10	9.35
Dubuque, Iowa	7.15	7.40
Madison, Wis	7.35	7.60
St. Paul, Minn	8.35	8.60
Burlington, Iowa	7.35	7.60
Des Moines, Iowa	8.80	9.05
Davenport, Iowa	7.15	7.40
St. Joseph, Mo	9.05	9.30
Leavenworth, Kan	9.05	9.30
Omaha, Neb	9.05	9.30

Colorado Anthracite.

COLORADO FUEL & IRON COMPANY.

Denver	$8.00
Pueblo	8.00
Colorado Springs	8.00
Leadville	8.00
Cheyenne, Wyo	10.00
All points between Denver and Missouri River	9.35

IN A LETTER lately received from William J. H. Gluck, Baltimore, Md., he says that amid the general closing of factories and business disasters he is happy to say that he has been running his factory full the whole year, just the same as during the former months, and expects to keep this up for the balance of the year. "At times it took all the courage I could command to keep things going; but I think the worst calamity that can befall us is to deprive the laborer of his living by closing factories and shutting out his opportunity to earn wages. At all hazards the manufacturers should be encouraged and helped to keep their factories running. My spring business was very good, summer business moderate and fall business, so far, fair."

WE ARE INDEBTED to Lord & Thomas, 45 Randolph street, Chicago, Ill., for a serviceable little rule, 6 inches in length, arranged for measuring advertising space. These rules are being distributed to general advertisers, and will, no doubt, be found useful.

CONDITION OF THE

Hardware Trade.

A SOMEWHAT BETTER DEMAND is reported by jobbing houses since the opening of October, which is in part accounted for by the fact that orders are usually placed with more freedom the first week or two of the month, and especially in such times as the present, when money is not overabundant. The volume of business, on the whole, continues without material change and the trade are still purchasing with great care and caution. There is a good deal of inequality in the demand, some lines being much more active than others. Builders' Hardware, for example, is moving sluggishly, while seasonable goods, on the other hand, are in very fair demand, comparatively little complaint being made.

Orders from manufacturers for raw material, tools and miscellaneous supplies are referred to as exceptionally light, a fact which reflects the conservative disposition which characterizes this department of trade. It is a matter of common remark that the retailers as a class are purchasing more freely than the jobbers and the small jobbers more freely than the largest. Some of the leading jobbing houses are in fact limiting their purchases to absolute requirements and prefer to let their stocks be somewhat broken to keeping them fully assorted, as is their usual practice. There is a disposition also to avoid pressing sales and much more attention than usual is being given to the matter of credits. Prices are without material modification, and while on the general line of Hardware they are well maintained, the tone of the market is not strong, and the low prices which are ruling for such staple articles as Nails and Wire tend to weaken the confidence of the trade in the stability of quotations on other lines. As a result there is an entire absence of speculative buying, and orders are limited to early and in most cases immediate requirements. It is gratifying to note that there is much less complaint in regard to collections.

Notes on Prices.

Wire Nails.—During the past week the condition of things referred to in our last report continued without important change. The volume of business has been fair considering existing conditions and most of the mills have a moderate supply of orders. Prices are without improvement on a basis of $1.30 to $1.35 for large lots at mill, the former figure being usual y obtainable. It is understood that in some cases it has been shaded.

Advices from Chicago. — The approach of winter and the prospects of the close of navigation have caused an increased inquiry for Wire Nails from various parts of the Northwest and the trade of the past week has been a little better than previously. Factories able to make shipments by lake have been especially favored by this inquiry and their reports are rather more cheerful than those of their competitors. Prices may be quoted on a basis of $1.40 to $1.45, Chicago, for factory lots. Jobbers are experiencing a good demand from their customers and continue to quote regular prices at $1.55 for small lots from stock.

Cut Nails.—The Cut Nail market is not in any better condition than the Wire Nail market. The demand is small and prices somewhat irregular and weak. The market is represented by the quotation of 95 cents to $1 for carload lots at mill, but it is not unlikely that with attractive averages and desirable orders slight concessions could be obtained. Most of the mills are limiting their production and some are shut down altogether. The feeling is expressed that there is but little ground for anticipating an early improvement in either demand or prices. Small lots from store in New York are held regularly at $1.25 to $1.30.

Advices from Chicago.—A better business is reported in Cut Steel Nails, but not enough to push the factories to any serious extent. Prices are unchanged at $1.20 to $1.25, Chicago, for factory lots, notwithstanding the advance in freight rates from Eastern points, which went into effect on Monday. Jobbers report a good business in city orders, but very little demand from the country. They quote $1.30 for small lots from stock.

Barb Wire.—There is but little doing in Barb Wire. Prices are somewhat ragged and weak. The market is represented by the quotation of $2.30 to $2.35 for carload lots of Four-Point Galvanized at mill. Small lots from store are quoted at about the usual advance.

Advices from Chicago. — The Barb Wire situation has attained a point beyond which there seems to be no improvement. Farmers are evidently not doing as much as had been expected in construction of fencing, and manufacturers' orders are consequently rather light. Carload lots of Glidden Wire are now selling at $2.50 for Galvanized, while Waukegan is quoted at $2.65, with 10¢ added for less than carloads. Ordinary Galvanized Barb Wire is selling at $2.45 for carloads and $2.55 for small lots.

Brace Screw Driver. — Goodell's Brace Screw Driver, offered by C. E. Jennings & Co., 79-81 Reade street, New York, is sold at $15 per dozen, net.

Crown Sad Irons.—The Crown Sad Irons, improved, manufactured by the Colebrookdale Iron Company, Pottstown, Pa., whose New York office is in charge of Duncan K. Major, 103 Reade street. They are sold at a discount of 60 and 10 per cent. from the following list:

No. 230, Plain polished, per dozen sets.	$24.00
No. 235, Nickel plated, " "	30.00
Extra handles, per dozen....	4.00
Extra stands, "	1.00

Glass.—There is no noticeable change in the condition of the Glass market since our last report. The limited demand for Window Glass continues, but the National Window Glass Company do not consider that the demand justifies the starting up of factories. Some of the New Jersey factories are reported as starting up, also one factory in Pennsylvania and one in Indiana. The demand for imported Glass is comparatively small, and American Plate Glass works are finishing up sufficient of the rough Glass on hand to fill orders. Quotations remain unchanged and are fairly well maintained as follows: American Window Glass, less quantities than carloads, 80 and 10 per cent. discount, f.o.b. at shipping point. French Window Glass, 75 and 10 and 5 per cent. discount. American Plate ranges in price from 50 and 10 and 7½ per cent. discount to 60 and 5 per cent. discount. Imported Plate Glass, 60 per cent. discount to 60 and 10 and 5 per cent. discount.

Old Metals.— The market for Old Metals rules dull, with buyers and sellers diverging largely in their ideas of values. Prices are irregular, and quotations are consequently subject to the urgency of requirements or sales. The following are the outside prices paid for Old Material delivered in New York:

Heavy Copper	℔ 6⅝¢
Light and Tinned Copper	℔ 6¼¢
Heavy Brass	℔ 5¼¢
Light Brass	℔ 4½¢
Lead	℔ 2¾¢
Tea Lead	℔ 2½¢
Zinc	℔ 2½¢
No. 1 Pewter	℔ 14¢
No. 2 Pewter	℔ 6¢
Wrought Scrap Iron...℔ gross ton	$12.00 @ $13.00
Heavy Cast Scrap.....℔ gross ton	11.00 @ 12.00
Stove Plate Scrap.....℔ gross ton	7.00 @ 8.00
Burnt Iron (delivered at mill) ℔ gross ton	5.00 @ 6.00

Old Rubber.—Market dull and featureless. Quotations for New York delivery rule about as follows:

Car Springs, ton lots, ℔ lb. .... @	$0.03¼
Rubber Shoes, carloads, delivered at factory, ℔ lb.. .... @	.03
Rubber shoes, less than carloads, ℔ lb.....0.02¼ @	.03⅛
Large Hose, ℔ ton..... .... @	9.00
White Wringer Rolls, ℔ lb. .... @	.04¼
White Syringes, ℔ lb..... .... @	.05

Old Rags, Paper, &c.—There is only a very limited market for Old Rags, Paper, &c., paper mills being reputed as well stocked up. New York prices for these materials are about as follows:

No. 1 White Rags.....℔ lb	3¼ @ 3½
No. 2 White Rags.....℔ lb	2⅝ @ 2¾¢
Mixed Rags.....℔ lb	¾¢
Blues and 3ds.....℔ lb 1	@ 1¼¢
Hard Sized White Shavings℔ lb	2¼¢
No. 1 White Book Shavings ℔ lb 1¾	@ 2 ¢
No. 2 White Book Shavings℔ lb 1	@ 1½¢
Light Book Shavings.....℔ lb	¾¢
No. 1 Mixed Shavings. ...℔ lb	¾¢
No. 2 Mixed Shavings.....℔ lb	½¢
No. 1 Printed Books .....℔ lb	1 ¢

Ordinary Mixed Books	₰ lb	½ @	¾¢
Newspapers	₰ lb		3-5¢
No. 1 Manila Paper	₰ lb	⅞ @	1 ¢
No. 2 Manila Paper	₰ lb	⅝ @	¾¢
Bogus Paper	₰ lb		1½¢
Common Paper	₰ lb	⅜ @	½¢
Straw Chips	₰ lb	½ @	⅝¢
Binders' Clippings	₰ lb	½ @	⅝¢
Jute Butts	₰ lb	1⅛ @	1¼¢
No. 1 Jute Bagging	₰ lb		1 ¢
Mixed Bagging	₰ lb	¾ @	1 ¢
No. 2 Bagging	₰ lb	½ @	¾¢
Hemp Twine	₰ lb		2¼¢
Manila Rope	₰ lb		2½¢
Jute Rope	₰ lb	1½ @	1¾¢
Mixed Rope	₰ lb	¾ @	⅞¢

Trade Notes.

KUMBERGER & CLEMENT are the firm who succeed Jeffers & Kumberger, 158 West Broadway, New York, and are the agents for the White & Middleton Gas Engine made in Baltimore.

THE LUDLOW-SAYLOR WIRE COMPANY, St. Louis, Mo., have just completed a number of contracts for outside and inside decoration. Prominent among them may be noted a large wire fence of pleasing design for the Anheuser-Busch Brewing Company, St. Louis; artistic stable fittings for two large livery stables in St. Louis; elevator inclosure for the Polytechnic Building, St. Louis; this latter work being of pressed work with hammered iron leaf work, and a large number of heavy window guards for the Insane Asylum at Fulton, Mo.

BRUCE & COOK, 186 to 190 Water street, New York, are now receiving per steamer from Europe a large invoice of Russia Iron and Tin Plate, which they are prepared to offer at favorable prices. They also carry in stock a full line of Galvanized and Harvey's cleaned cold rolled Sheet Iron, Sheet Zinc, Elbows and a full line of tinners' supplies. They likewise make of their own manufacture a special brand of Solder, which they offer at advantageous figures. Plumbers and tinners who have used it are well satisfied as to results.

THE NEW YORK PEANUT ROASTER WORKS, at 226 Hudson street, New York, make a specialty of Tanney's Patent Peanut Roaster, which is made in several sizes and widely sold.

THE MYERS PUTZ POMADE COMPANY, 144 High street, Boston, Mass., have been appointed sole agents in the country for Putz Extract, a preparation for polishing bright metal goods, which is manufactured by Fritz Schulz, Jr., Leipzig, Germany.

THE SHEET-IRON SHOP of Geo. A. Suter & Co., 139 South Fifth avenue, New York, is busily engaged on the work for some large heating and ventilating plants.

Twenty-eight men were drowned on September 29 in the Mansfield Iron Mine in Michigan, through the waters of the Michigamme River breaking through their bed, weakened by the mining excavations below. The Mansfield Mine is situated about 6 miles from Crystal Falls, the capital of Iron County. It has been worked for four years, and has shipped about 660,000 tons of Bessemer ore. The mine is one of the few which have been worked continuously during the recent depression.

In a paper in the current issue of the *North American* Mayor Gilroy of New York estimates that the value of the city's property has grown from $277,000,000 to $559,000,000 since 1871.

Burning Gas Coke.

From the address of President M. P. Mallet before the Société Technique du Gaz, recently held in Paris, we print the following extract bearing on the use of gas coke in domestic fires:

As to coke, it is the most remunerative of the by-products; in some cases the money got for it is fully half that received for the gas. Thirty years ago we could not possibly have got rid of the quantities we now regularly dispose of. Very little was used in houses; it was not generally understood how to burn it there; and even industry hesitated about it, save as an inferior fuel. Since then it has come greatly into domestic use; proper apparatus has come into general use; the Paris Gas Company have done a great deal in this direction; slow combustion stoves have come greatly into use, one firm in Paris having made 175,000 within the last five years. The Marseilles Gas Company, who have metallurgical works of their own, use 10 000 tons a year in these, or about 40 per cent. of the total coke used. In the department of the Loire some blast furnaces use gas coke to the extent of 30 per cent. of the whole. The four railway companies which come into Paris use from 75,000 to 80,000 tons a year for their locomotives, in the suburbs. Gas coke is also used by large metallurgical works in their gas producers; it is also much used for forge fires, and also for raising steam.

Coke dust is ceasing to be a vexation to us; we are learning now how to burn it and how to gasify it. The Godillot system and the Robin system enable us to do this. M. Robin has installed in Paris alone 500 of his coke dust stoves for heating public or private buildings, and 1400 elsewhere. And even in steam raising, coke dust is regularly being used, up to 70 per cent. of the fuel, by means of wide hearth bars, very close together. The Société is to visit the Say refinery, where there are 68 boilers, with a heating surface of 171,560 square feet, in which this is being done. Coke dust has therefore a market before it.

The use of coke has, to some extent, wakened up the use of anthracite. The stove which will burn coke will generally burn anthracite, which is now found used in such stoves. But fortunately for us anthracite is very dear; it costs in Paris $10 a ton.

Although hot water pipe stoves take a good deal of coke dust, still all arrangements which to do away with heating of individual rooms are opposed to the sale of coke, since the stoves can burn any cheap fuel. But such methods are only coming in slowly, and in houses of great size, or in large buildings.

The greatest adversaries of the use of coke are ourselves, through the zeal with which we push the use of gas for heating. Already half the coke we sell in Paris goes to manufacturers. It is desirable rather to push its use in domestic heating, else we shall some day fail to get our prices for it. In country towns the use of coke is very little known. There is no reason why this should be so. In Brussels the consumption of gas coke per inhabitant was three times as great in 1891 as in 1886. Where coke is not known it might be sold at as reasonable a rate as possible, at any rate for a time, until the use of it had been understood. It is even better that the inhabitants should have their coke somewhat cheaply than that the same money should be thrown away in benefiting commission agents and railway companies. The coke must, of course, be broken for domestic use. It is bewildering to find some works actually sending it out for house use unbroken. And it must, of course, be kept dry; it must not get wet. We must make people acquainted with the existing apparatus for burning coke. Our Belgian brethren are on the alert, and have instituted a competition for the best apparatus for burning coke. Some good results will, we hope, follow. But even now the apparatus is good, and it is for us to bring it under people's notice by all the means which are necessary to insure publicity. And we ought to lend them coke stoves in the same way as we have so successfully lent gas stoves.

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Metal and Miscellaneous Prices.

CHICAGO, OCTOBER 5, 1893.

Tin—
Straits pigs .....22½¢

Imported Tin Plates—
Charcoal Plates.—Bright.

Guaranteed Plates command special prices, according to quality.

		Per box.
Calland and Melyn Grade	IC, 10 x 14	@ $6.75
	IC, 12 x 12	@ 6.75
	IC, 14 x 20	@ 6.75
	IC, 20 x 28	@ 13.50
	IX, 10 x 14	@ 8.75
	IX, 12 x 12	@ 8.75
	IX, 14 x 20	@ 8.75
	IX, 20 x 28	@ 17.50
	DC, 12½ x 17	@ 6.50
	DX, 12½ x 17	@ 8.50
Allaway Grade,	IC, 10 x 14	@ 6.50
"	IC, 12 x 12	@ 6.50
"	IC, 14 x 20	@ 6.50
"	IC, 20 x 28	@ 13.00
"	IX, 14 x 20	@ 8.00
"	IX, 20 x 28	@ 16.00

Coke Plates—Bright.

	Per box.
Steel Coke—IC, 10x14, 14x20	$5.75 @$5.85
IC, 14x20, 90 lb	5.50 @ 5.60
IC, 14x20, 100 lb	@ 5.85
10 x 20	8.75 @ 9.00
20 x 28	11.50 @12.70
X, 10x14, 14 x 20	@ 7.35
B.V. Grade. IC, 10x14, 14x20	5.85@ 6.00

Charcoal Plates.—Terne.

Guaranteed Plates command special prices, according to quality.

Mansel and Dean Grades.—
IC. 14 x 20 ..@ $5.62½
20 x 28.....@ 11.25
IX. 20 x 28.....@ 14.25

Worcester Brand and equal.—
IC, 14 x 20.. 6.12½@ .....
IC, 20 x 28..12.25 @ .....
IX, 14 x 20.. 7.62½@ .....
20 x 28..15.25 @ .....

American Tin Plates.
Charcoal Plates.—Bright.

Irondale, A. A.—IC, 14 x 20 ..... $7.00
" " IX, 14 x 20 ..... 9.00
" " IXX, 14 x 20 ..... 11.00
" " IC, 20 x 28 ..... 14.00
" " IX, 20 x 28 ..... 18.00
" " IXX, 20 x 28 ..... 22 00

Florence.—
IC, 10 x 14, 12 x 12, 14 x 20..$6.75
IX, 10 x 14, 12 x 12, 14 x 20.. 8.50

Palma.—
IC, 10 x 14, 12 x 12, 14 x 20..$7.25
IX, 10 x 14, 12 x 12, 14 x 20.. 9.25

Each extra cross $2.00 and 20 x 28 double these prices.

Brilliant, Tissue Packed, IC, 14 x 20..$9.25
Royal, extra, IC, 14 x 20 ..... 7.25
Merion, IC, 14 x 20 ..... 7.00
Almond, IC, 14 x 20 ..... 6.50
Mint, IC, 14 x 20 ..... 6.25

Coke Plates.—Bright.

Elwood.—IC, 14 x 20 ..... $6.00
" IC, 20 x 28 ..... 12.50

Roofing Plates.

Arch, IC, 20 x 28 ..... @$11.75
Crescent, IC, 20 x 28 ..... @ 12.25
Crescent, IX, 20 x 28 ..... @ 15.25
Empire, IC, 20 x 28 ..... @12 50
Empire, IX, 20 x 28 ..... @15.50
Hickory, IC, 20 x 28 ..... @ 12.75
" IX, 20 x 28 ..... @ 15.75
Alaska (heavily coated), IC, 20x28 @$14.50
Alaska IX, 20 x 28 ..... @ 17.75
Special, IC, 20 x 28 ..... @ 15.50
" IX, 20 x 28 ..... @ 18.50
Merchant's Roofing (extra coated), IC, 20 x 28 ..... @$17.75
Merchant's Roofing (extra coated), IX, 20 x 28 ..... @$21.50
Merchant's Old Method, (extra heavily coated), IC, 20 x 28 ..... @$19.75
Merchant's Old Method (extra heavily coated), IX, 20 x 28 ..... $23.60
Irondale A:
IC, 14 x 20 ..... $6.25
IX 14 x 20. ..... 7.75
IC, 20 x 28. ..... 12.50
IX, 20 x 28. ..... 15.50
Westmoreland:
IC, 14 x 20 ..... $6.25
IC, 20 x 28. ..... 12.50
Elwood:
IC, 20 x 28 ..... $12.00
Juno:
IC, 14 x 20. ..... $5.75
IC, 20 x 28. ..... 11.50
Illinois, Old Method:
IC, 20 x 28. ..... $17.00
E. L.:
IC, 20 x 28. ..... $12.50
Jessie:
IC, 20 x 28. ..... $12.00
Scott's Extra Coated, Stamped and Resquared, IC, 14 x 20 ..... $9.50
Scott's Extra Coated, Stamped and Resquared, IX, 14 x 20 ..... 11.00
Scott's Extra Coated, Stamped and Resquared, IC, 20 x 28 ..... 19.00
Scott's Extra Coated, Stamped and Resquared, IX, 20 x 28. ..... 22.00
Neville, Stamped, IC, 14 x 20 ..... 6.25
" " IX, 14 x 20. ..... 7.50
" " IC, 20 x 28 ..... 12.50
" " IX, 20 x 28. ..... 15.00
Taylor's Old Style, IC, 14 x 20 (Stamped and Resquared) $9.50
Taylor's Old Style, IC, 20 x 28 (Stamped and Resquared) 19.00
Taylor's Roofing, IC, 14 x 20 (Stamped and Resquared) 8.25
Taylor's Roofing, IC, 20 x 28 (Stamped and Resquared) 16.50
Columbia, IC, 14 x 20 (Stamped) 7.25
" IC, 20 x 28 (Stamped) 14.50
Maple, IC, 14 x 20 (Stamped) 6.75
" IC, 20 x 28 (Stamped) 13.50
Willow, IC, 14 x 20 ..... 6.50
" IC, 20 x 28. ..... 13.00
Knoxall, IC, 14 x 20 ..... 6.25
" IC, 20 x 28. ..... 12.50
Globe, IC, 14 x 20. ..... 6.00
" IC, 20 x 28 ..... 12.00
Miami, IC, 14 x 20. ..... 6.00
" IC, 20 x 28. ..... 12.00
" IX, 20 x 28 ..... 15.00
" (Redipped), IC, 20 x 28 ..... 17.00

Tin Boiler Plates.

	Per box of 100 sheets.	Per box of 112 sheets.
X, 14 x 28	$13.00	$13.00
XX, 14 x 28	14.50	14.50
X, 14 x 31	14.50	15.80
XX, 14 x 31	16.50	17.50

	Per box of 56 sheets.	
X, 14 x 56	29.50	16.50
XX, 14 x 56	32.50	18.20
X, 14 x 60	31.50	17.65
XX, 14 x 60	35.50	20.90

Sheet Iron—
Black.

	Common American	Refined.
Nos. 10 to 16	2 6 10¢	3 2 10¢
17 to 20	2 7 10¢	3 3 10¢
21 to 24	2 8 10¢	3 4 10¢
25 and 26	2 9 10¢	3 5 10¢
27	3¢	3 6 10¢

Russia, Planished, &c.

Genuine Russia, all numbers....13¢ net.
Patent Planished....A, 10½¢; B, 9½¢
dis. 5%
Craig's Polished.....8¼¢

Galvanized.

Juniata or first quality.....dis. 70&5%

Copper—
Ingot.

Lake.....11¾¢ @ 12¼¢
Casting Brands.....11¢ @ 11½¢

Sheet and Bolt.

Discount, 25%.

Copper Bottoms.

Discount, 25%.

Seamless Brass and Copper Tubes.

Base price, 17½¢, Chicago, with extras according to size.

Copper, Bronze and Gilding Tube, 3¢ lb additional.

Brazed Brass Tubing.
(To No. 20 inclusive.)

Add freight from New York to Chicago to these prices, or 50¢ lb 100 lb.

Above 6-16 inch to 3 inch inclu	35¢	40 @ 45%
Plain, above 3 inch	45¢	
Plain, 5-16 inch	45¢	
Plain, ¼ inch	60¢	
Plain, 3-16 inch	$1.00	
Plain, ⅛ inch	$1.50	
Fancy Tubing, Brass, to No. 20 incl	43¢ lb	
Bronze Tubing, 3¢ lb more than Brass		

Roll and Sheet Brass.

Discount, 35 @ 40%.

Slab Spelter—
Western Spelter.....5

Sheet Zinc—
600 lb casks.....5
300 lb casks.....5¼
Loose sheets.....5½¢

Lead—
Soft Pig Lead.....4¼¢
Bar.....4.60¢@5¢
Pipe.....5½¢, dis. 10¢
Block Tin Pipe.....35¢
Sheet.....6¢, dis. 10%

Solder—
½&½.....13¢@13¼¢
Extra Wiping.....11½¢

The prices of the many other qualities of Solder in the market indicated by private brands vary according to composition.

Antimony—
Cookson.....12 @12½¢
Hallett's.....11¼¢@11¾¢

Wrought-Iron Pipe—
List on following page.

1¼ and under, Plain.....57½&10%
1¼ and under, Galv.....52½&10%
1½ and over, Plain.....67½&10%
1½ and over, Galv.....60&10%
Boiler Tubes, list Oct. 24, 1892...65@67½%
Casing, list Nov. 16, 1892.....52½%
Inserted Joints Casing, list Nov. 16, 1892.....47½%
Steel Boiler Tubes.....27½%
Cold Drawn Seamless Steel Tubing...50%

Cast-Iron Soil Pipe—
Cast-Iron Soil-Pipe, Tarred; sizes 2 to 6 inches, inclusive.....dis 70&2½%
Other sizes.....dis 60%

Leader Pipes—
Abendroth's Galv. Spiral Riveted.....60%
Austin's Corrugated.....60%
Gordon & Gilbert's Corrugated.....60%
Ritchie's (Galv. Iron only) Cor'd.....60%
Ritchie's Spiral Lock Seam, Galv'd....5t%
Austin's Spiral Ribbed Pipe.....60%
Plain Adjustable Elbows.....60%
James A. Miller Bros. (Galv'd Iron only) Corrugated.....60%

Furnace Fittings—
Discount from Excelsior Steel Furnace Co's list.....50%

Steel Roofing—
Perfection.....$3.75 square
Climax.....$3.50 square
The Lloyd Spanish Tiling....$4.50 square

Metallic Shingles—
Cushman's.....$1.25 square
Merchant & Co.'s Spanish Tiles:
Copper, 14 oz.....$36.00 square
Tin.....$9.75@$14.25 square
Steel, painted.....$9.00 square

Drain Pipe—
Discount from list.....50%

Paints Oils, &c.—
Deodorized Benzine.....7½@8
Iron Paint, Bright Red .....lb, 2
" " Brown.....lb, 1½
" " Purple.....lb, 2½
" Ground in oil, B. Red lb, 6½
" Ground in oil, Red..lb, 6½
" Ground in oil, Brown lb, 5½
" Ground in oil, Purple lb, 6
Linseed Oil, Boiled, in bbls.....53¢
Linseed Oil, Raw, in bbls.....50¢
Mineral Paints.....2@4¢
Orange Mineral.....10¾¢
Pure White Lead in Oil.....6¾@7¼¢
Dry White Lead in bbls.....6¼@6¾¢
Red Lead, American.....7@7½¢
Red Venetian, English, dry...$1.65@$1.70
Red Venetian in oil; asst'd cans, 8½¢; kegs.....7½¢
Sipe's Japan Oil, in bbls, gal.....34¢
Spirits Turpentine, in bbls., gal...32½¢
Asphaltum, Trinidad Refined, ton..$45
Tarred Felt, 1 Ply, 100 lb.....$1.65
Tarred Felt, 2 Ply, roll 108 sq. feet.....$1.50
Tarred Felt, 3 Ply, roll of 108 sq. feet.....$2.00
Roofing Pitch, bbl. of 300 lb.....$3.20

NEW YORK, OCTOBER 6, 1893.

The following quotations are for small lots.

Aluminum—
No. 2 Grade Metal, in ton lots..lb, $0.75
No 1 (guaranteed to be 98 % pure and over), in ton lots .....lb .90
Lots less than 1 ton, 10¢ lb additional.

Antimony—
Cookson .....lb, 11¢
Hallett's.....lb, 10½¢

Brass—
Planished.....net
Roll and Sheet.....35@40%

Brass and Copper Tubes
Brazed Brass Tubing—
List May 20, 1889.

	Per lb.	
Plain, to No. 20 inclusive, above 5-16 inch to 3 inch inclusive	$0.35	35@40%
Plain, to No. 20, above 3 inch	45	
Plain, 5-16 inch to No. 20	45	
Plain, ¼ inch	60	
Plain, 3-16 inch	1.00	
Plain, ⅛ inch	1.50	
Fancy Tubing to No. 20, inclu	43	

Copper and Bronze Tubing—
3¢ lb more than brass.

Bronze, Tobin—
Drawn Rods for Bolts, Forgings, &c
Over ¼ to 3½ inches inclusive....17¢ lb
Over 3¾ to 5 inches inclusive.....18¢ lb

Piston Rods, Finished True, Smooth and Straight.
Over ¼ to 3½ inches inclusive....18¢ lb
Over 3¾ to 5 inches inclusive.....19¢ lb

Clips—
Buffalo Damper: Nos. 1, $1.25; 2, $2.50 per doz.....40&10%

Conductors—
Corrugated. *Round or Square—*
Galvanized.....60%
Galvanized, Locked Joints.....60%
Tin.....60%

Spiral Riveted—
Galvanized 50%
See also *Elbows and Shoes; Eave-Trough Miters; Strainers, Conductor.*

Conductor Strainers—See *Strainers, Conductor.*

Copper—
Bottoms, Pits and Flats....25@25&5%
Ingot.
Lake.....11¢
Ansonia Grade Arizona.....10½¢
Ansonia Grade Casting.....10¢
Planished......net
Sheet and Bolt......25&25&5%

Tubes — See *Seamless Brass Tubes.*

Coppers, Soldering—
See *Irons, Soldering*, in Current Hardware Prices.

Damper Clips Buffalo—
See Clips, Buffalo Damper.

Eave Troughs—
Lap or Slip Joint, Galvanized.....60&10%
Lap or Slip Joint Terne.....60%

Eave-Trough Mitres—
Lap or Slip Joint.....list, net

Elbows—
Plain Adjustable—
Tin.....70%
Galvanized.....70%

Crimped Tubing—
Re-Tinned or Galvanized.....35%

Stove-Pipe—
Buffalo Four-Piece.

4½	5	5½	6	7 inch,
$0.78	.87	.90	.99	1.20 per doz..20 %

Elbows and Shoes—
Flat Crimp.
Tin.....35%
Galvanized.....35%

Corrugated.
Flat Crimp.
Galvanized.....60%

Round or Square.
Tin.....60%
Galvanized.....60%

Iron, Sheet—
Black.

	Common American.	R. G. Cleaned American.
Nos. 10 to 16	lb, 2¼	3 10¢
Nos. 17 to 20	lb, 2.85	3.10¢
Nos. 21 to 24	lb, 2.90	3.20¢
Nos. 25 and 26	lb, 3.05	3.30¢
No. 27	lb, 3.15	3.40¢
No. 28	lb, 3¼	3½¢
American B. B.	lb, 4¢@4½¢	

Russia, Planished, &c.
Genuine Russia, according to assortment.....lb, 11¾@12¼¢
Patent Planished....lb, A, 10¢; B, 9¢, 5%
Craig Polished Sheet.....lb, 8¼¢

Galvanized.

	R. R.	
Nos. 10 to 16		71½&2½@ 71&5%
Nos. 17 to 22		
Nos. 23 to 24		
Nos. 25 to 26		
No. 27		
No. 28		
Nos. 29 and 30		

Filter Joints—
Lee's.....33⅓

Lead—
American Pig.....4¼¢@4¾¢
Bar.....4¾¢
Pipe.....6¢, 20%
Tin Lined Pipe.....15¢, 20%
Block Tin Pipe.....37½¢, 20%
Sheet.....6 50¢, 20%
Old Lead in exchange, 3¼¢ lb.

Metal, Expanded—
Manufacturers' list No. 5.
Lathing 10%
Fencing, Painted Sheets.....20%
Netting, Painted Sheets.....20%
Door Mats, Galvanized.....25%
Window Guards, Paneled.....15%
Tree Guards, Paneled.....15%

Mitres Eave-Trough—See *Eave-Trough Mitres.*

Paints Oils &c.—
Lead, Amn. White, in oil..... 6¾ @ 7¼
Lead, Red, bbls. and ½ bbls... 6½ @ 7
Lead, Red, kegs .....6½ @ 7
Ocher, American ..... 1 @ 1½
Red, Venetian, American..... 1½ @ 2½

Linseed Oil:
Raw, ₩ gal..... @ .40
Boiled..... @ .43

Spirits Turpentine
In bbls..... @ .32

Putty:
In barrels and ½ bbls..... .01¾ @ .01¾
In tubs..... .01⅞ @ .01⅞
In tin cans..... .01½ @ .02⅛
In bladders..... .01⅞ @ .02¼

Roofing Material, &c.:
Asphaltum, Trinidad Refined, ₩ ton..... $30.00@$35.00
Asphaltum, Rock, ₩ ton..... $14.00
Coal Tar Felt, 1 Ply, ₩ ℔..... 2¢
Coal Tar Felt, 2 Ply, ₩ roll 108 sq. ft. $1.42½
Coal Tar Felt, 3 Ply, ₩ roll 108 sq. ft. $1.85
Roofing Pitch, ₩ bbl..... $2.25

Pipe, Drain 50%

Pipe and Fittings, Cast Iron Soil—

Cast-Iron Soil Pipe, Tarred, sizes 2 to 6 Inches, inclusive..... 60@60&10%
Other sizes..... 55@55&10%
Cast-Iron Fittings, Tarred, sizes 2 to 6 inches..... 60@60&10%
Other sizes..... 55@55&10%

Pipe, Spiral—

Galvanized..... 60%
Tin..... 60%

Rock and Slag Wool—

	₩ ℔	₩ cub. foot.
Slag Wool, ordinary	1¼	15¢
Slag Wool, extra	4¼	38½¢
Rock Wool, ordinary	2¼	27¢
Rock Wool, extra	7¼	43½¢

Rosin—

Common and Good—Strained,
Rosin, C. & D..... ₩ bbl. $1.02@$1.05
Rosin, E. & F..... ₩ bbl. $1.15@$1.30
Rosin, G. & H..... ₩ bbl. $1.45@$1.70
Rosin, I. & K..... ₩ bbl. $1.90@$2.35
Rosin, M. & N..... ₩ bbl $2.50@$3.50

Seamless Brass Tubes..net

Shoes and Elbows—See *Elbows and Shoes.*

Slate Roofing—

According to size, f.o.b. cars, Quarry Station.

Pennsylvania:
Best Bangor, ₩ sqr..... $3.25@$4.50
Pen Argyle, ₩ sqr..... 3.50@ 4.25
Peach Bottom, ₩ sqr..... 5.00@ 6.25
No. 1 Chapman, ₩ sqr..... 4.00@ 4.65
Lehigh Slates, ₩ sqr..... 3.00@ 4.50
Vermont:
Sea Green, ₩ sqr..... 2.70@ 3.20
Purple, ₩ sqr..... 3.50@ 4.50
Unfading Green, ₩ sqr..... 3.50@ 4.00
Red, ₩ sqr..... 9.75@12.00

Solder and Soldering Fluids—

Solder—

½ & ½ (Guaranteed)..... 13½@14½¢
No. 1..... 11¾@12 ¢
Prices of Solder indicated by private brands vary according to composition.

Soldering Fluids—

Concentrated Soldering Flux.
f.o.b. New York.
In barrels, ₩ ℔..... 4¢
Smaller quantities, ₩ ℔..... 5¢

Gedney's Soldering Fluid.
In carboys or barrels, ₩ ℔..... 2¢
$1.50 for carboy or barrel; money refunded when returned.

Perfection Soldering Flux.
No charge for package.
8bls., about 500 ℔, ₩ ℔..... 3½¢ } 5% dis.
½ bbls., about 300 ℔, ₩ ℔..... 4¢
Kegs, about 110 ℔, ₩ ℔..... 4¢
75¢ extra for keg.
Kegs, about 55 ℔, ₩ ℔..... 4¢

Yager's Soldering Salts.
½-℔ bottles, each..... 30¢
Large quantities, per ℔..... 40¢

Spelter—

Western Spelter..... 4½¢@4¾¢
Bertha..... 8¾¢@9¢

Spiral Pipe—See *Pipe, Spiral.*

Stove-Pipe Elbows—*See Elbows, Stove Pipe.*

Stove Polish—See *Polish, Stove.*

Stove Trucks—See *Trucks, Stove.*

Strainers Conductor—

Galvanized..... 60%

Tin, Pigs and Bars—

Banca, pigs, ₩ ℔..... 22½¢
Straits, pigs, ₩ ℔..... 22¢
Straits in bars, ₩ ℔..... 23¢

Tin Plates—

American Terne Plates—

Alaska (re-squared) IC, 14 x 20..... $7.00
Alderly, extra quality, IC, 14 x 20..6.37½
Allegheny, IC, 14 x 20..... 6.12
" IX, 14 x 20..... 6 38
Apollo Roofing, IC, 14 x 20..... 6.25
" " IX, 14 x 20..... 7.25
Bonus, Extra Coated, IC, 14 x 20... 6.75
" " " IX, 14 x 20.... 8.25
Buckeye, IC, 14 x 20..... 7.00
" IX, 14 x 20..... 8.25
Chicago, IC, 20 x 28..... 11.50
Central, IC, 14 x 20..... 5.37½
Climax, IC, 14 x 20..... 5.70
Columbia, IC, 14 x 20..... 7.00
Crescent, IC, 14 x 20..... 6.00
Dunlap's Double Dipped, IC, 14 x 20 8.25
" " IX, 14 x 20 9.50
" Domestic, IC, 20 x 28..... 12.00
" " IX, 20 x 28..... 15.00
Empire, IC, 14 x 20..... 6.12½
Extra Central, IC, 14 x 20..... 5.62½
First New York, IC, 14 x 20..... 5.75
First New Jersey, IC, 14 x 20..... 5.75
Flag, IC, 14 x 20..... 5.50
Fort Pitt, IC, 20 x 28..... 11.00
Globe, IC, 14 x 20..... 5.75
Hamilton's Best Redipped, IC, 14x20 9.25
" " " IX, 14x20 10.75
Hickory (Resquared), IC, 14 x 20..6.37½
Juno, IC, 14 x 20..... 5.75
Kensington, IC, 14 x 20..... 6.75
" IX, 14 x 20..... 8.00
Knoxall, IC, 14 x 20..... 6.00
Laufman's Apollo (Resquared), IC, 14 x 20..... 8.12
Laufman's Apollo (Resquared), IX, 14 x 20..... 9.37
Leominster, Extra Coated, IC, 14x20 7.75
Lion (Stamped), IC, 14 x 20..... 6.25
Lula, Best Charcoal, IC, 20 x 28 ...12.50
" " " IX, 20 x 28....16.00
Manhattan, IC, 14 x 20..... 7.00
Maple, IC, 14 x 20..... 6.50
Merchant's Old Method (Resquared), IC, 14 x 20..... 9.50
Merchant's Roofing (Resquared), IC, 14 x 20..... 8.50
McKinley, IC, 20 x 28..... 12.00
" IX, 20 x 28..... 15.00
Neville, IC, 14 x 20..... 6.00
" IX, 14 x 20..... 7.25
N. F. Old Style, IC, 14 x 20..... 7.50
" " IX, 14 x 20..... 9.00
Old Colony, IC, 14 x 20..... 8.00
Optimus, Best Redipped, IC, 14 x 20 8.25
" " IX, 14 x 20 9.50
Osceola, Hand Coated, IC, 14 x 20.. 8.25
" " IX, 14 x 20.. 9.75
Palacio, IC, 14 x 20..... 5.55
Pennsylvania Old Method (Treble Coated), IC, 14 x 20..... 8.50
Phoenix, IC, 14 x 20..... 5.80
Scott's Extra Coated (Resquared), IC, 14 x 20..... 9.25
Scott's Extra Coated (Resquared), IX, 14 x 20..... 10.75
Taylor Old Style (Resquared), IC, 14 x 20..... 9.25
Taylor Roofing, IC, 14 x 20..... 8.00
Thomson's Puritan, IC, 14 x 20..... 5.75
Tip Top, IC (Resquared), 14 x 20.... 6.62
" IX " 14 x 20.... 7.88
U. S. Monongahela, IC, 14 x 20..... 6.5.
U. S. Redipped, IC, 14 x 20..... 9.75
Venux, IC, 14 x 20..... 5.60
Waldo Redipped, IC, 14 x 20..... 7.25
Westmoreland, IC, 14 x 20..... 6.25
Wilkinsburg Redipped, IC, 20 x 28.16.00
" " " IX, 20 x 28.19.00
Willow, IC, 14 x 20..... 6.25

American Bright Plates—

Almond, IC, 14 x 20..... $6.25
Brilliant (Tissue Packed), IC, 14x20. 9.00
Climax, IC, 14 x 20..... 6.50
" IX, 14 x 20..... 8.00
Florence, IC, 14x20..... 6.75
Hazel, IC, 14x20..... 5.85
Linden, IC, 14x20..... 6.50
Merchant's Dipped, IC, 14x20..... 11.00
Merion, IC, 14x20..... 6.75
Mint, IC, 14x20..... 6.00
Palma Xtra, IC, 14x20..... 7.25
Phoenix, IC, 14x20..... 6.25
" IX, 14x20..... 7.75
Royal, Extra, IC, 14x20..... 7.00
U. S., IC, 14x20..... 7.25

Imported Terne Plates—

Charcoal.
Dean Grade.—IC, 14 x 20..... @$5.50
20 x 28..... @11.00
IX, 14 x 20..... @ 6.75
20 x 28..... @13.50
Abercarne Grade.—IC, 14 x 20..... @ 5.40
20 x 28..... @10.80
IX, 14 x 20..... @ 6.62½
20 x 28..... @13.25

Imported Bright Plates—

Charcoal.
Duty: 2.2¢ ₩ ℔.
Melyn and Calland Grade. IC, 10 x 14..... @$6.50
" " IC, 12 x 12..... @ 6.75
" " IC, 14 x 20..... @ 6.50
" " IC, 20 x 28..... @18.00
" " IX, 10 x 14..... @ 8.50
" " IX, 12 x 12..... @ 8.75
" " IX, 14 x 20..... @ 8.50
" " IX, 20 x 28..... @17.00
" " DC, 12½ x 17..... @ 6.00
" " DX, 12½ x 17..... @ 8.00
Allaway Grade. IC, 10 x 14..... @ 6.00
" " IC, 12 x 12..... @ 6.25
" " IC, 14 x 20..... @ 6.00
" " IC, 20 x 28..... @12.00
" " IX, 10 x 14..... @ 7.50
" " IX, 12 x 12..... @ 7.75
" " IX, 14 x 20..... @ 7.50
" " IX, 20 x 28..... @15.00
" " DC, 12½ x 17..... @ 5.50
" " DX, 12½ x 17..... @ 7.00

Coke.
Steel Coke.—IC, 10x14, 14x20.$5.40@$5.50
10x20..... @ 8.50
20x28.11.50@12.00
IX, 10x14, 14x20..... @ 6.75
B. V. Grade.—IC, 10x14, 14x20.... @ 5.50

Imported Boiler Plates.—

IXX, 14x26..(112 sheets)..... @$13.38
IXX, 14x28..(112 sheets)..... @ 14.50
IXX, 14x31..(112 sheets)..... @ 16.00

Tinning—

Brass and Copper.....net

Tubing—

Tin..... 55%
Galvanized..... 55%

Brass and Copper.—

Standard List..... 35@40%

Troughs, Eave—See *Eave Troughs*

Trucks Stove—

Improved Lock Frame, per doz.... $15.00
Steel Lock Frame, per doz..... 18.00
Daisy Improved Pattern, ₩ doz.... 13.00

Zinc—

600 ℔ casks..... ₩ ℔ 5¾¢@6¢
Per ℔..... 6½¢

A Modern Factory Building.—The building in course of erection for the Diamond Machine Company of Providence is in many respects the finest edifice of the kind in that city. The land upon which it stands has a frontage of 450 feet on Atwells avenue, a depth of 350 feet on Kingsley avenue, bounded on the north and east by the Woonasquatucket River, leaving ample and sufficient accommodation to erect further buildings of this class when they are required. The building is 205 feet long, 60 feet wide, is set 12 feet back from the street line, built of brick and granite, foundation stone of the very heaviest material, foundation walls 4 feet thick, granite underpinning 23 inches deep, 8 inches wide, 1½ wash, brick wall on the first floor 24 inches, on the second 20 inches, on the third 16 inches. Height of stories 14 feet from top of floor to top of next floor. The floor beams 10 x 16 of Georgia hard pine, all floors covered with 4 inches spruce plank, with the top floor 1-inch maple, tongued and grooved. There is no basement under the building. The latter is filled up with coarse gravel, made thoroughly compact by wetting down with water, then concreted on top, upon which rests 4 inch spruce planks with 1 inch top maple. The windows are 11 feet high, 5 feet wide, arched and arranged with transoms at the top to secure good ventilation. The floor beams 10 x 16, stand 9 feet apart, are supported by posts on the lower and upper floor, 10 inches diameter, the latter turned round, bored through the center to prevent checking, with two coats of linseed oil upon them. These posts are supported on granite underpinnings 4 feet square, which rest upon foundation walls extending 11 feet below the floor. There will be three sets of double doors for machinery and two end doors for the operatives, one on each floor at the rear of the building. The machinery doors are 11 feet high, 7½ feet wide, 3 inches thick and paneled. There are no chimneys in the building, which is to be supplied with modern sprinklers. Two sets of stair cases with maple treads, 2 inches. Norway pine partition stock, 2 inches. The building will have a gravel roof 5 ply, first 3 ply, of the best Beaver brand and a wash on top of that, covered with Oyster Bay white gravel.

There are two lines of shafting on each floor, elevators for hoisting purposes. The factory is to be lighted by electricity. The power is supplied from a separate building of brick and granite, erected upon their land (40 x 50) where engine boiler and blacksmith shop are contained. A 75 horse-power engine with 100 horse-power boiler is to be used. It is designed by the builders to secure a strong rigid building with strength sufficient to meet every requirement in the business, perfectly lighted and ventilated, protected from fire by all modern improvements.

According to Commodore Ramsey, Chief of the United States Bureau of Navigation, the recent Columbian naval review, entailing the prolonged presence of many American war vessels in home waters, was responsible for an unusually large number of desertions from the navy. During the year ended September 30, 1259 men and boys deserted, of whom 1079 went ashore in the United States.

News and Notes.

The Hydrographic Office of the Navy has received information respecting 20 derelict vessels, wrecked during the hurricane of August, which have been seen along the Atlantic Coast from Maine to North Carolina, presenting a serious obstruction to navigation. Steps for removing the vessels are in contemplation.

The recent epidemic of train robberies has induced the managements of some Western railroads to arm their employees with rifles; and express companies will in future use additional precautions to protect the valuable property forwarded by them.

A Philadelphia safe deposit company are about to build a chain of warehouses on the Delaware River front of the city at a cost of $1,000,000, which, it is said, will give Philadelphia the best storage facilities for merchandise of any city on the Atlantic Coast.

A new weekly steamship service is about to be established between Philadelphia and Liverpool, by the Johnson Steamship Company of England in competition with the American line of steamers, which has maintained a service between the two ports for the past 20 years.

Since the opening of navigation the Erie Canal has brought from Buffalo 34,400,000 bushels of grain, compared with 21,000,000 in 1892 and 24,000,000 in the previous year. The growing importance of the canal is evident from the fact that this year it is carrying about 40 per cent. of the grain traffic, where last year it carried but 25 per cent.

LABOR EXCHANGE.

Notices under this heading of reasonable length are inserted free of charge. Only those relating to employment are admitted. Write distinctly on one side of paper only, and do not use postal cards.

HELP WANTED.

Six experienced MOUNTERS wanted in a stove foundry. Ohio Stove Company, Portsmouth, Ohio. Oct. 7

SALESMEN in every large town to sell a staple line of hardware on commission. "Edwards," care E. S. Adams, office of *The Metal Worker*, 312 Cuyahoga, Cleveland, Ohio. Oct. 7

TRAVELING SALESMEN to sell specialty in sheet metal as side line; good commission. "R. W. B.," office of *The Metal Worker*, 220 South Fourth street, Philadelphia. Oct. 7

A first-class FOREMAN and CUTTER for a galvanized cornice and skylight works; state wages expected and experience. "Foreman," Box 107, office of *The Metal Worker*, 96-102 Reade street, New York City. Oct. 7

A STOVE SALESMAN, thoroughly acquainted with the trade of New York City and Brooklyn, to represent a large manufacturing house. Apply, stating former employers and references. "A. B.," office of *The Metal Worker*, 96-102 Reade street, New York City. Oct. 7

FIVE SHEET METAL AND SKYLIGHT MAKERS. Apply to James F. Dean, 38-40 North street, Salem, Mass. Oct. 7

At once, first-class TINSMITH; good job. P. Monagham, South Amboy, N. J. Sept. 30

At once, a STEAM and HOT-WATER FITTER; one who is competent to take charge of jobs with a helper; state age, experience and wages. P. O. Box 80, Warren, Mass. Sept. 30

A first-class TINSMITH on tinware; one that can furnish some capital to manufacture and take part interest; write for particulars. H. W. Gazlay, 138 Groton avenue, Cortland, N. Y. Sept. 30

A reliable, temperate TINSMITH, who understands roofing, general jobbing, inside and outside work, iron-pipe work, and has some knowledge of plumbing; write, stating wages expected and experience; a steady job for suitable man. J. W. Beard, Plainville, Conn. Sept. 30

SITUATIONS WANTED.

By a TINNER with 12 years' experience at roofing, guttering and general jobbing; young man; sober. Box 207, Harrodsburg, Ky. Oct. 7

An experienced man desires position as SUPERINTENDENT of stove foundry; first-class reference given. "Stove Foundry," Box 107, office of *The Metal Worker*, 96-102 Reade street, New York City. Oct. 7

A practical STEAM and HOT WATER FITTER, capable of estimating and constructing work, desires to represent in Philadelphia and vicinity some party or manufacturer of heating specialties, or would take the agency for, and push the sale of, some special goods of merit in the heating or plumbing line, on commission or salary; reference and security if necessary. "W. C.," office of *The Metal Worker*, 220 South Fourth street, Philadelphia, Pa. Oct. 7

By a WOOD and METAL PATTERN MAKER who is also a molder by trade, and a first-class wood turner; can do a fair job at tinning; worked for Seymour & McIntosh until they shut down; best of references. Madison Vorce, 15 Wood street, Auburn, N. Y. Oct. 7

By a METAL PATTERN MAKER who can file, fit and ornament stoves, originate patterns or repair same. "J. P.," 11 Delevan street, Auburn, N. Y. Oct. 7

By a TINNER, with 11 years' experience at all kinds of inside and outside work, tinware and piping; steady job desired with some good hardware house; small city preferred. "Tinner," 113 E. Second street, Pine Bluff, Ark. Oct. 7

By a STOVE PATTERN MAKER who has had 15 years' experience; can give good reference. C. W. Williams, 225 Warren street, Pittston, Pa. Oct. 7

A first-class plumber, gas, steam and hot-water fitter wants a position of trust as FOREMAN of shop; is thoroughly reliable, estimating from plans and specifications; close figurer; is a practical mechanic, and capable of handling small or large jobs; 22 years' experience; understands testing soil pipe and first-class work; has passed examination of plumbers in New York City and Brooklyn, N. Y.; first-class references given if required. "On the Square," office of *The Metal Worker*, 96-102 Reade street, New York City. Oct. 7

Man of practical and commercial experience in hardware, cutlery, notions and electrical work desires engagement in a responsible position; highest references. Box 2268, General Post Office, New York City. Oct. 7

Steady position with some good firm by a young man 25 years of age, as TIN and SHEET IRON WORKER; can also do warm air furnace work and slate roofing; 11 years' experience; steady, sober and industrious; can furnish best of references. "Tin and Sheet Iron Worker," L. Box 536, Cincinnati, Ohio. Oct. 7

In a good shop, by a boy 16 years of age, to learn the plumbing trade. "A. J. C.," P. O. Box 363, Haverstraw, N. Y. Oct. 7

Steady job wanted by a first-class PLUMBER; willing to go to any part of the United States' seven years' experience. J. Godsill, 1221 Third avenue, New York. Oct. 7

PLUMBER and GAS FITTER wishes employment in or near New York City; ten years' experience; sober, reliable and can furnish reference if required. "W. W. H.," 1910 Congress street, Louisville, Ky. Oct. 7

By an experienced STOVE PATTERN MAKER and CARVER of 12 years' practice at stove foundry; am a thorough mechanical and ornamental draftsman and designer on stove work in the latest styles. "Experience," office of *The Metal Worker*, 96-102 Reade street, New York City. Oct. 7

By competent cornice maker, as CUTTER or FOREMAN; looks for steady employment; best of references. "L. M." 101, office of *The Metal Worker*, 59 Dearborn street, Chicago, Ill. Oct. 7

By a practical SHEET IRON WORKER, who can work from plans and lay out and cut out all kinds of work; capable to have charge of shop. "Capable," office of *The Metal Worker* 96-102 Reade street, New York City. Oct. 7

A young married man, 26 years of age, in the hardware, stove and tinware business, wholesale and retail, wishes to better his position; is also conversant with the details of bookkeeping; best of references. Joseph Birbeck, Post Office box 157, Freeland, Pa. Sept. 30

As BOOKKEEPER; has had experience in wholesale and retail plumbers' and mill supplies; can give reference. F. H. Carter, 275 South Factory street, Springfield, Ohio. Sept. 30

Cornice cutter of 12 years' experience desires a position as CUTTER or FOREMAN by October 15; thoroughly understands the business in all its branches; the West preferred; can furnish the best of references. "A. B. C.," office of *The Metal Worker*, 59 Dearborn street, Chicago, Ill. Sept. 30

An experienced hardware SALESMAN wishes a position with some good firm, either in store or on the road; capable of taking full charge of a store; can give best of references. Box 53, Middletown, Ohio. Sept. 30

By a thoroughly first-class PLUMBER, a steady position in or near New York; 15 years' experience; can take charge and do a little tin work if necessary; state wages. "A. W.," care Mitchell Bros., 438 Grove street, Jersey City, N. J. Sept. 30

As TINNER on furnace and job work. "Tinner," P. O. Box 169, Cochranton, Pa. Sept. 30

By a young TINSMITH, 24 years old; competent to do any work in this branch. L. Kreurmann, 199 Forsyth street, New York City. Sept. 30

By a japanner, as FOREMAN with a first-class house in the West; understands all the branches of the business and can instruct boys and girls. "Japanner," office of *The Metal Worker*, 96-102 Reade street, New York City. Sept. 30

By a young man, as TINSMITH; 18 years' old; three months in this country. Mr. Schapiro, 217 Madison street, New York City. Sept. 30

Experienced STEAM FITTER, well acquainted with the latest system of burning oil under boilers and heaters. C. F. Pluemacher, 455 Ninth avenue, New York City. Sept. 30

WOOD PATTERN MAKER and CARVER in stove works; competent to make drawings, both ornamental and mechanical. J. Thomas, 10 Broadway, two flights, front, Troy, N. Y. Sept. 30

By a PLUMBER who thoroughly understands plumbing and gas fitting, also has some knowledge of steam fitting; steady position desired for the fall and winter in some Southern town or city; has worked in city and country; temperate. F. J. Wolfel, care B. D Lum & Son, Stamford, Conn. Sept. 30

As SUPERINTENDENT or FOREMAN, by man skilled as such; 12 years' experience in designing drill jig and fixtures for small parts in any line; also have had the management of pattern shop in wood and metal, machinery, architectural, boiler, electrical, sewing machines and follow board and snap flask work in all branches; am capable of filling a position in any mechanical line; 35 years old, 11 years foreman near New York City; have splendid references. R. Mudd, 1759 South Eighteenth street, St. Louis, Mo. Sept. 30

By a first-class stove mounter and pattern fitter, position as FOREMAN of mounting or pattern-fitting rooms; ten years' experience in the above position; very best of references. "Western," office of *The Metal Worker*. 96-102 Reade street, New York City. Sept. 30

Good all-round TINNER; steady job the year round; strictly sober and reliable. "G. E.," Box 55, Bethel, Conn. Sept 30

Having closed up my stove, furnace and tinware manufacturing business, would like a position as HOME or TRAVELING SALESMAN for either the above or kindred lines; can furnish abundant evidence of integrity and ability, and willing to contract with a reputable firm on commission basis if expenses are paid. "J. B. L.," office of *The Metal Worker*, 96-102 Reade street, New York City. Sept. 30

By a TINNER of six years' experience at furnace work, roofing, spouting and jobbing; am strictly temperate and reliable; steady job wanted in town or country; state wages. "A. B.," Box 83, Woodstock, Ontario. Sept. 30

TINSMITH, in and outside worker, wants a steady job; city or country. Littman, 1575 Avenue A, New York City. Sept. 30

TINSMITH, general jobber, desires a good job; city or country. I. Loene, care Mr. Sideman, 505 East Eighty-seventh street, New York City. Sept. 30

By a practical cornice and skylight maker, first-class cutter and draftsman; 12 years' experience; competent to have charge of shop and men; thoroughly understands the business inside and outside; desires position as FOREMAN or CUTTER. "Practical," Box 930, office of *The Metal Worker*, 96-102 Reade street, New York City. Sept. 30

By a TINSMITH and ROOFER. Herman Landesbery, 292 Delancy street, New York City. Sept. 30

By an A1 pattern fitter and stove mounter, as FOREMAN or to work at the bench; position desired by January 1, 1894. Frederick Kent, 1188 Congress street, Detroit, Mich. Sept. 30

By a first-class TINSMITH; ten years' experience; city or country; single. J. Kleinberger, care of Harry Black, 162 West Twenty-fifth street, New York City. Sept. 30

By a PLUMBER who is also a good gas and hot-water fitter; sober, steady and reliable; city or country. "Plumber," 18 Centre street, Yonkers, N. Y. Sept. 30

By a single man 24 years old, with seven years' experience at tin and iron work, in and outside; state wages for a steady job. W. G. Cook, 731 West Cedar street, Akron, Ohio. Sept. 30

As FOREMAN in an iron foundry, by a practical molder; understands the handling of men and all the duties connected with iron and foundry business; can furnish good reference. "W. T. C.," 113 Hewes street, Brooklyn, E. D., N. Y. Sept. 23

STEAM and GAS FITTER wishes employment in country; 26 years. Geo. P. Farrell, 322 West Seventeenth street, New York. Sept. 23

By a PRACTICAL MECHANIC, CUTTER and FOREMAN; 27 years' experience at the tin, copper, sheet iron, galvanized iron, cornice and slating work; thorough draftsman; can estimate on work; speak English and German; state wages. J. Hase, St. Louis, Mo. Sept. 23

In good general hardware store as SALESMAN and BOOKKEEPER; or to exchange a fine improved 400 acre farm, lightly encumbered, for $6000 stock general hardware; farm in East Nebraska. C. W. Crum, Norfolk, Neb. Sept. 23

As PLUMBER, by Edmund Walsh, 304 East Fifty-ninth street, New York. Sept. 23

By a first-class MACHINIST and LATHE HAND; city or country. P. Klein, care of Roth, 228 East Second street, New York. Sept. 23

By a first class MACHINIST and LATHE HAND, city or country. L. Fried, 341 East Houston street, New York. Sept. 23

Young man, age 23, with good reference, worked at the tin, sheet-iron, stove and furnace business for four years, would like to get a steady job in the Eastern or Middle States; salary very reasonable to begin with if there is any chance for improvement. F. G. Shadigg, Prescott, Wis. Sept. 23

Special Notices.

FOR SALE.

In a healthy, elevated town of 400 inhabitants, the contents of a well stocked stove and tin shop, together with the tools and material of a plumbing and heating business. I have been in business over 20 years and have a large trade. It is a good chance for a pushing man with some capital. For sale cheap, as I am getting old (74) and am in poor health. For more particulars address "SELLER," office of *The Metal Worker*, 96-102 Reade St., New York.

WANTED.

Second-hand National Cash Register.
LOCK BOX 63,
Clinton, Ill.

SITUATION WANTED

by a practical Tinner of twenty (20 years' experience in all kinds of inside and outside work, furnace, cornice, roofing, dairy and all kinds of piece work. I want to start a first-class shop. Will furnish tools and stock if I can get with some good, reliable firm. I am sober and reliable; can furnish good references. Wisconsin, Illinois or Minnesota preferred. To any firm wanting such a man, address,
"W. E. P.," Lock Box, 3, Granton, Wis.

FOR SALE.

A well-equipped stove foundry, located in the iron region of the South; has been in operation ten years; the buildings and machinery are new, having been erected on a new site recently, the patterns are of good salable stoves; it is located on three trunk lines and a navigable river and in one of the largest cities of the South; the present owners will agree to take half of the output; terms, one-third cash and balance can be paid in product of the foundry in two or three years. Owners have other interests which engage their attention. For further information address
"STOVEMAN."
care of JAMES J. SMITH & CO., 119 Dearborn St., Chicago, Ill.

FOR SALE.

Having purchased the patterns, tools and the business of the Hotel Car Range Co., we have a complete set of tinners' and sheet iron tools and such as required for a range shop. Both hand and power bending machines, power drills, &c. Will sell cheap, apply
BRAMHALL, DEANE & CO.,
79, 81 & 83 Market St., Chicago, Ill.

FOR SALE.

An old-established stove and tin business with stock and tools. Only small capital required. Poor health reason for selling.
A. F. MOSELEY, Federalsburg, Md.

A RARE INVESTMENT.

Old-established stamped and japanned ware factory for sale at a great sacrifice. For particulars address.
"STAMPING,"
office of *The Metal Worker*, 96-102 Reade St., New York.

FOR SALE.

Tin and hardware store in a growing town. For reasons address
J. G. NESENSON,
Lock Box 175, Grand Valley, Warren Co., Pa.

FOR SALE.

As I wish to retire from business, I offer my stock of Hardware and Stoves of about $10,000 for sale. A splendid paying business; will stand the very closest investigation, and a chance of a lifetime. Situated in a lively town in Wisconsin. Don't answer this unless you mean business. Address "BUSINESS," office of *The Metal Worker*, 59 Dearborn street, Chicago.

FOR SALE.

STOCK OF HARDWARE AND TINNERS' TOOLS.

New and in good shape, will invoice about $3500; in a good town of Eastern Iowa; good farm land surrounding and A No. 1 trade; do not wish to trade; must sell, as other business interests demand my attention. For particulars address "IOWA," office of *The Metal Worker*, 59 Dearborn St., Chicago, Ill.

BENZINE OR WATER
Paste Stove Polish at 4 to 6 Cts. per Pound
Guaranteed the best. None better.
Send for circulars.
YATES & CO., Rockford, Ill.

Special Notices.

YOUNG MAN DO YOU WISH TO LEARN A GOOD TRADE?

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A Three Months' Day Course of Instruction in
PLUMBING and GAS FITTING
Will commence on Jan. 2, 1894.
TERMS, $40.

A Six Months' Evening Course of Instruction in
PLUMBING
Will commence on Oct. 16, 1893,
TERMS, $14.

☞ The Plumbing department is under the supervision of a Trade School Committee appointed by the New York Master Plumbers' Association.

Day Instruction is also given in Bricklaying and Plastering, House and Fresco Painting, Carpentry, Sign Painting and Printing.

Evening Classes in Bricklaying, Carpentry, House Painting, Plastering, Fresco Painting, Stone Cutting and Blacksmiths' work.

The New York Trade School has attained a high reputation and is largely attended each year, the young men coming from all parts of the United States and Canada. Excellent lodging accommodations are provided near the school for pupils desiring them.

Catalogue, illustrated with 30 photo engravings, mailed free on application. Address
NEW YORK TRADE SCHOOL,
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NEW YORK.

Partner Wanted.

A member of a large wholesale house with superior connections and well-established trade among stove dealers and kindred branches desires a partner, silent or active. Particulars furnished to parties who send full name and address. Apply
"STOVES,"
P. O. Box 1086, Philadelphia

A Set of Tinners' Tools

For Sale cheap. For any information write or inquire of C. H. ANDREWS,
Box 398, Athol Center, Mass.

Special Notices.

!!! FOR SALE !!!

BAKER BLOWERS, Nos. 1, 4½, 5, 6 and 7.
ROOT BLOWERS, Nos. 1, 2, 3, 4, 5, 6 and 7.
Sturtevant Blowers. Nos. 4, 5, 6, &c.
1 Corliss Band Wheel, 12 ft. x 24 in., in halves.
A variety of Machinery, such as Boilers, Engines, Pumps, Crushers, &c., very cheap.
Do you want to buy or sell Machinery? If so, write
C. R. BIGELOW, Machinery Expert,
45 Dey St., New York City

FOR SALE.

A valuable Stove Plant, comprising stoves, ranges and heating stoves, wood and iron patterns, flasks and fallow boards, carrying with it a large repair trade, sufficient to pay for plant in short time. Address
"INVESTMENT,"
office of *The Metal Worker*, 96-102 Reade St. New York.

FOR SALE.

To Close an Estate.

An old (11 years) established plumbing business, with stock and tools, in a live Western City having water, sewer and gas systems. A rare chance for a practical man. Address
"F. R.,"
office of *The Metal Worker*, 59 Dearborn St., Chicago.

FURNACE ESTIMATE BOOK.

SEND FIFTY CENTS TO
DANIEL P. HOLMES,
NORWICH, N. Y.,
And you will receive, postage paid, a book in which you can make estimates and diagrams for
FIFTY WARM AIR FURNACES,
And do it correctly and complete without referring to numerous register and pipe lists.
Cloth Cover, 50 cts. Full Leather, $1 00.

THE IDEAL Tea and Coffee Strainer

Affords absolute protection to the cloth.
Manufactured by
THE IDEAL STRAINER CO.
206 State St., Boston, Mass.

MORSE, WILLIAMS & CO.

Morse Elevator Works.

MANUFACTURERS AND BUILDERS OF
ELECTRIC, HYDRAULIC, BELT and HAND POWER PASSENGER and FREIGHT

ELEVATORS.

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THE METAL WORKER.

NEW YORK AND CHICAGO.

Saturday, October 14, 1893.

DAVID WILLIAMS, - PUBLISHER

BUSINESS OFFICES:

NEW YORK.....96-102 Reade Street.
PHILADELPHIA.....220 South Fourth Street.
BOSTON.....146 Franklin Street.
PITTSBURGH..... Room 509 Hamilton Building.
CHICAGO.....59 Dearborn Street, cor. Randolph.
CINCINNATI.....Rooms 22-24 Pickering Building.
ST. LOUIS.....Bank of Commerce Building.
CLEVELAND.....312 The Cuyahoga.

BRITISH AGENCY: The Ironmonger, 42 Cannon street, London, England.

New York Trade School.

Preparations are being made at the New York Trade School, First avenue between Sixty-seventh and Sixty-eighth streets, for the opening of the session of 1893-94, on Monday next, the 16th inst. The registration of candidates commenced on October 2, since which date nearly 200 applications have been received for a course in the various evening classes. Probably this number will be considerably augmented on the night of opening. As usual, candidates for instruction in the plumbing classes far exceed those in any other trade, comprising about one-third of the total number of applications. The popularity of the school shows no signs of abating, and the attendance this season will, it is estimated, fully equal if it does not exceed that of last year. The day classes do not begin their curriculum until January 2. Evening classes, commencing on Monday, include those for instruction in plumbing, bricklaying, stonecutting, carpentry, painting and blacksmithing. During the summer the school has received visits from a number of Americans and foreigners interested in trade education who displayed great interest in the arrangements of the institution and the system of training followed. Among the foreign visitors were Professor Dr. Gustaf Retzius of the University of Stockholm, Sweden; M. Kuru, Japanese Government Architect and Commissioner for Japan at the World's Fair; William Gillies of Mico Institution, Kingston, Jamaica, W. I.; W. Pick, Parisian delegate to the Columbian Exposition, and Theodore Richards and Rev. C. M. Hyde, trustees of the Kamehameha Manual Training School, Honolulu.

Something Wanted in Stoves.

Since processes of enameling cast iron have become so common, and have been brought to such a state of perfection, why is not possible to apply some kind of enamel to the tops of cooking stoves and ranges, so as to emancipate housewives from the so frequently recurring and extremely disagreeable task of blacking stoves? Such an improvement would be immensely popular if it could be supplied at moderate cost and be made so durable as to wear during the life of a stove or range. Of course, the enameling of all parts would be desirable, if it could be done without a too great increase of cost. The tops of stoves are particularly mentioned, because the top being exposed to the highest degree of heat does not long retain a coat of blacking, and, in order to be kept looking nice, requires almost daily attention. It is safe to say that scarcely any kind of domestic work is more repugnant than stove blacking. Yet good housekeepers have such a horror of the reddened, blotched and unsightly appearance of a neglected cooking stove or range that they impose upon themselves the frequent task of blacking and polishing, in spite of its disagreeable nature. Probably black would be the color preferred for such a finish as is herein suggested, but, except that it would seem rather odd at first, the gray color of the enamel familiar now in enameled ware does not appear objectionable. Probably some difficulty would have to be encountered at first in obtaining enamel sufficiently resistant to heat; but in view of what has already been done a solution of the problem does not seem hopeless.

The Traveling Salesman.

The best commercial friend that the retailer has to-day is the traveling representative of the manufacturer or jobber. The time when the buyer went to the seller has long since passed, and the present system of traveling salesmen is of decided benefit to the dealer. It is much easier to obtain low quotations when one stands behind one's own counter and is asked to purchase by the commercial traveler than is the case if he visits the wholesale establishment and makes known by his presence his need of goods. Then the terms are more satisfactory, for the dealer can exert a personal influence upon the salesman which would have little effect if he were not standing in the midst of his own business and extending his patronage rather than asking for credit. There is a recognized personal appreciation of the value of the trade, which exerts a marked influence on the decision of the salesman as to both prices and terms. The salesman not only desires to sell the goods in the interests of his employers, but he also is ambitious to increase his sales in order to satisfy his own ambition and reputation as a successful salesman. No matter how humble the dealer he will invariably receive at the hands of the traveling salesman an amount of consideration which he could never expect were he to visit the factory or warehouse. The salesman knows that to succeed he must be courteous, well informed and fair in his dealings, and the dealer, therefore, is treated with respect and his interests protected, because the salesman recognizes that an honest policy will hold his customer.

Giving Information.

Another way in which the traveling salesman exercises his friendly offices to the retailer is in the matter of keeping the dealer posted as to changes of styles, variations in value and improvements in goods. The salesman is well aware that to hold the interest of the dealer he must be the first to show him a sample of the latest fad or device. He must be the first to notify him of the decline or rise in prices, and the first to warn him of the public change in favor of some new fashion or method to which the dealer may cater. The salesman at stated and regular periods visits the store of the dealer with his valise or trunk, and, after some general conversation as regards business news, asks permission to display the samples of his line of goods. The relative values of each article are clearly described and their uses explained if necessary, and a comparison given in an intelligent manner of the competing goods on the market. The dealer by this means has an opportunity to learn many valuable points about the goods, and is afterwards able to better describe their values and uses to his own customers. The man who "knows it all," or the man who knows enough about the details of his business is yet to be born, and it is, therefore, a matter of no small importance to the dealer to educate himself in all directions.

Watching the Dealer's Interests.

After the samples have been exhausted and the dealer has selected his purchases and given the order, the salesman feels it his duty to see that proper instructions are given as to shipping, packing, &c., and is solicitous that the order shall reach his customer on the dates and conditions specified. On the other hand, should the dealer see fit not to order, the salesman will accept the verdict in a proper spirit and leave with a hope of future business relations. These remarks are of course in regard to the conduct of the successful salesman. There is no

doubt still some cross-grained and tricky men who act as representatives of wholesale houses, but their number is decreasing. The successful salesman of to-day must be a gentleman, not only in appearance and manners, but at heart as well. He must feel the responsibility of his position and merit the confidence of the trade. It is not a matter of sentiment; it is a cold fact of business dollars that fair treatment and honest statements win the race.

Railroad Construction in 1893.

An interesting statement with regard to railroad construction this year is made by the *Railway Age* of Chicago. The total new mileage laid during the first nine months of the year, as obtained from official sources, was 2040.85 miles. Ordinarily, at least 50 per cent. more track would be laid during the remaining three months, but from the present outlook it is regarded as doubtful if the total for the year exceeds 2500 miles. Details of the track laid in each State or Territory for the nine months are as follows:

Track Laid in First Nine Months of 1893.

State.	Lines.	Miles.
Alabama	5	46.
Arizona	1	42.
Arkansas	4	12.75
California	7	64.32
Colorado	2	16.76
Florida	7	103.50
Georgia	6	62.50
Idaho	1	5.57
Illinois	7	64.80
Indiana	5	21.10
Iowa	1	4.
Kansas	1	18.45
Kentucky	5	25.50
Louisiana	3	8.25
Maine	2	71.50
Massachusetts	2	11.13
Michigan	1	0.50
Minnesota	4	42.21
Mississippi	1	3.
Missouri	7	139.95
Montana	1	27.
Nebraska	2	32.70
New Hampshire	1	1.
New Jersey	1	2
New Mexico	1	2.54
New York	6	31.39
North Carolina	8	69.60
North Dakota	2	194.60
Ohio	5	134.70
Oregon	1	11.50
Pennsylvania	43	364.05
Rhode Island	1	5.21
South Carolina	1	14.
South Dakota	2	62.06
Tennessee	3	17.30
Texas	6	140.82
Utah	1	9.
Virginia	5	16.64
Washington	2	41.90
West Virginia	14	76.05
Wisconsin	3	19.
Wyoming	1	4.
Total in 42 States and Territories	182	2040.85

If the estimate for the year proves correct, and the total new track laid does not exceed 2500 miles, the year 1893 will show a retrogression in this respect to the conditions obtaining in the period from 1874 to 1878, when the new track laid ranged annually from 1711 miles to 2712 miles. From present appearances the estimate will not be exceeded, as the rail mills of the country are all idle or running only spasmodically on very small orders, and if there was any considerable length of track to be laid during the fall and early winter this would not be the case. Taking the condition of the country's finances the past summer, it is rather surprising that even this much work has been accomplished in new construction. It would have been in entire harmony with the general wreck of business if all such work had been completely stopped. Its continuance under such discouraging circumstances excites the hope that as soon as the disturbing elements now interfering with commercial interests are out of the way there will be considerable activity in this direction.

Railroad building has not been overdone in recent years, and there are numerous deserving projects for new lines and extensions that are only waiting propitious times to be launched on the financial sea. There was a sudden dip downward in railroad construction in 1885, when the new mileage fell slightly under 3000 miles in consequence of financial disturbance, but it was followed by a quick recovery the next year, when over 8000 miles of new track was laid. While the panic of 1884 which caused that depression in railroad building was by no means so serious as the recent crisis, still the nation's recuperative power at this time ought to be fully as strong if not stronger, should wisdom rule in pending national legislation. The currency and tariff questions should be settled speedily. With these out of the way, no longer menacing business of every description, new enterprises in railroad building as well as in other lines would again be undertaken and new vitality would be imparted to our languid manufacturing interests.

Franklin Institute Lectures.

The programme of the 1893–94 course of lectures in connection with the Franklin Institute, Philadelphia, has just been issued. These lectures, which are on subjects of a scientific and technical character, are given each year on Friday evenings, beginning in November and ending in March. Admission is by members' tickets, members being also furnished with admission tickets for their friends. The lectures this season will number about 20, opening on November 3 with one by Prof. Edwin J. Houston on "A Plea for the Study of Forestry in the Lower Schools." Other interesting lectures on the programme are Horace Pettit of Philadelphia on "The Law of Inventions;" C. J. Hexamer on the "Evolution of the Workshop;" Prof. G. P. Merrill of the Smithsonian Institution on "Building Stones of the United States;" Prof. Elihu Thomson on "Induction Coils and Condensers;" W. N. Jennings on "Snap Shots at the Fair;" O. Chanute, C.E., of Chicago on "Aërial Navigation;" Professor Crocker of Columbia College, New York, on the "Electric Motor;" Henry R. Towne of Yale & Towne Mfg. Company on "American Bank Locks and Fastenings;" Rudolph Hering of New York on the "Purification of Water;" T. Dunkin Paret of the Tanite Company on "Emery and Other Abrasives;" Thos. D. Whitaker on "Portland Cement," and Prof. Edward Hart of Lafayette College, Easton, Pa., on "Carbon."

News and Notes.

The latest Cunarder "Lucania," which on her initial trip from Liverpool to New York beat all previous maiden records by a run of 5 days 15 hours and 37 minutes from Queenstown to Sandy Hook, made her second westward trip last week in 5 days 13 hours and 25 minutes, thus breaking the best former record—that of the American liner "Paris"—by 59 minutes. The chief engineer of the "Lucania" believes that she has not done her best yet, and that she may be relied upon to still further lower the time of transit by several hours.

Cuban papers contain complaints of a great dearth of good field laborers.

Some important shipments of anthracite have been recently made to England, and inquiries are noted for quotations on American coal from Mediterranean and other foreign ports, where the difficulty of obtaining adequate shipments from Great Britain since the strike is being severely felt.

Improvements proposed by the Dock Board on the North River front of New York from West Tenth to West Twenty-third streets comprise 19 large piers, 80 feet wide and ranging from 466 to 729 feet in length, with a distance between each pier of 225 feet, thus allowing two steamers to unload at the same time. The inside cost of the undertaking is placed at $11,000,000, but this would probably be materially increased if the whole scheme is carried out.

In the United States Circuit Court of Philadelphia on October 7, an injunction was obtained by the Edison Electric Light Company against the Westinghouse Light, Heat & Power Company for alleged infringement on incandescent lights.

Cuban sugar planters expect that the yield of next season will be a heavy one, and will enable them to retrieve the losses of last season, always provided that no cyclone visits the island during the present month. The appearance of the cane fields throughout the sugar region is described as very promising.

In illustration of the improvement which has developed recently in railroad freight traffic, the Philadelphia *Times* remarks that a few weeks ago the Pennsylvania Railroad had 16,000 idle freight cars standing along its various sidings. Reports received a few days ago showed that the number had been reduced to 6000. What is true of the Pennsylvania is also true of the Lehigh Valley. Hundreds of its freight cars which have been lying idle for months back on the coal region side track are now reported as in demand for Western coal and grain traffic, and all the empties have been ordered for inspection, preparatory to forwarding them West.

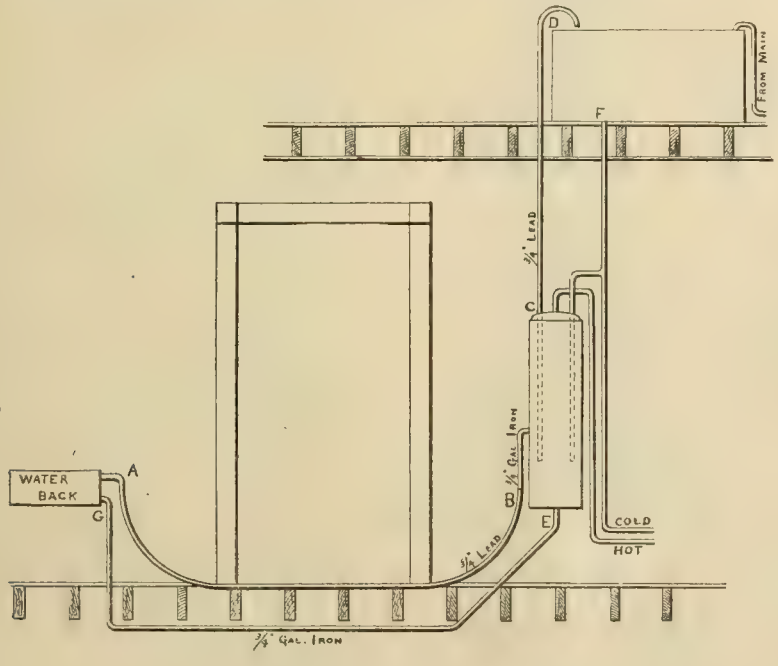
Business in Havana is reported as paralyzed, owing to the refusal of the customs authorities to accept bank notes in payment of duties.

The opening of the Manchester ship canal, which is announced for January 1, 1894, will enable cotton steamers to land their cargoes close to the mills, thus saving railway freights and the expense of handling on the other side. The canal is likely to make Manchester a formidable rival to Liverpool as a British port of entry.

THE LETTER BOX.

Water Back and Boiler Connection.

From G. E. M., *New Hampshire.*—I wish to obtain, through *The Metal Worker*, information concerning a range boiler which has given much trouble. The boiler is of copper, installed and piped as shown in the accompanying drawing. The water will not heat in the boiler. Can you give the reason and remedy? The circulation will occasionally start and continue for from five to thirty minutes and then stop. Sometimes the cold water pipe from boiler to water back will be warm. Occasionally the relief pipe C D will overflow, and at times there appears to be a blowing



Water Back and Boiler Connection.

back from the cold water supply pipe in the tank at F. The arrangement of boiler on one side of the door and the range on the other is the best I can do. The pipes A B and G E were placed below the floor because of doors and windows preventing their being carried around the room.

Note.—We have reproduced our correspondent's sketch. From the relative position of the boiler and water back, we think there will be little difficulty in presenting the reason for the imperfect circulation. The trouble is due to carrying both the pipes below the door. If circumstances are such that the position of these pipes cannot be changed, we are at a loss to know how our correspondent can get over his trouble. If the pipes, however, can be altered, we would suggest that the pipes A B be carried over the doorway and connected near the top of the range boiler, while the pipe G F might be brought up to the position at present occupied by A B where it goes under the door. We presume, from what our correspondent says, that the boiler cannot be changed, but if there is any change possible in the matter we would suggest that the most effective remedy would be to bring the boiler to the other side of the door next to the water back. If our readers have any suggestions to make, we would be glad to hear from them.

Difficulty with Pipes from Spring.

From J. F. S., *Washington, D. C.*—Having read the request of "A & S." of Owego, N. Y., in *The Metal Worker* of September 30, and your remarks on it, I would say if they leave the faucet open at the barn, the fall of the pipe will syphon the water from the pipe in the house. If they stop the faucet from running at the barn they will have water at the faucets in the house.

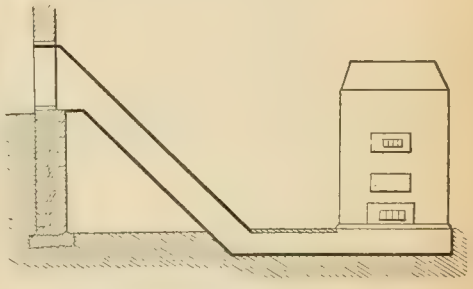
"Necessity" Pipe Union.

From J. W., *Greencastle, Ind.*—I note the article "Withholding Information" in *The Metal Worker* of September 16 and fully believe that an interchange of ideas by members of a craft may help some out of a hole who would be very grateful to the giver of the idea.

I send you a description of a wrought iron union pipe joint that I have named "Necessity," as that was the condition under which the idea was born. To make "Necessity" cut a long thread on the pipe so as to let the common socket run back flush with the end of the pipe. Then take a drift pin that is of the same pitch as the die that cut the thread and the tap that threaded the socket, and expand the pipe inside of the socket. Then bring the end of the other pipe up and back the socket off the long thread on to it. Backing off against a pitch and going forward against the pitch of the thread will, if rightly prepared, make a tight joint. Service men of gas companies and steam fitters will find "Necessity" their friend.

Two Styles of Air Ducts.

From J. H. T., *Meadville, Pa.*—I wish *The Metal Worker* and its practical readers to give their opinion as to



Two Styles of Air Ducts.—Fig. 1.—*With no Right Angle Turns.*

the advantage, if any, of running the cold air duct on a slant from the mouth to the furnace, as in Fig. 1, instead of letting it run down perpendicularly to a trench that runs to the furnace, as shown in Fig. 2. I contend that there would be no difference between the methods, so far as the air supply is concerned. I am setting a furnace for a customer as shown in Fig. 2, and he is very pronounced in his opinion as to this way of arranging a cold air duct. He predicts all manner of evil for it, and says it will not work and he will not have it. He says the furnace will not get a sufficient air supply with a perpendicular duct with a right angle turn in it. He has been to see me with his war paint on, and to prove to me

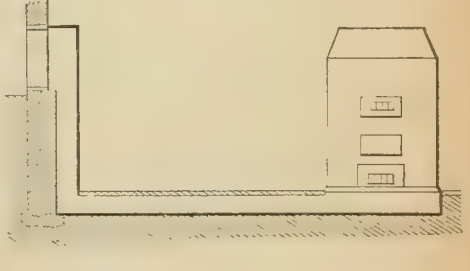
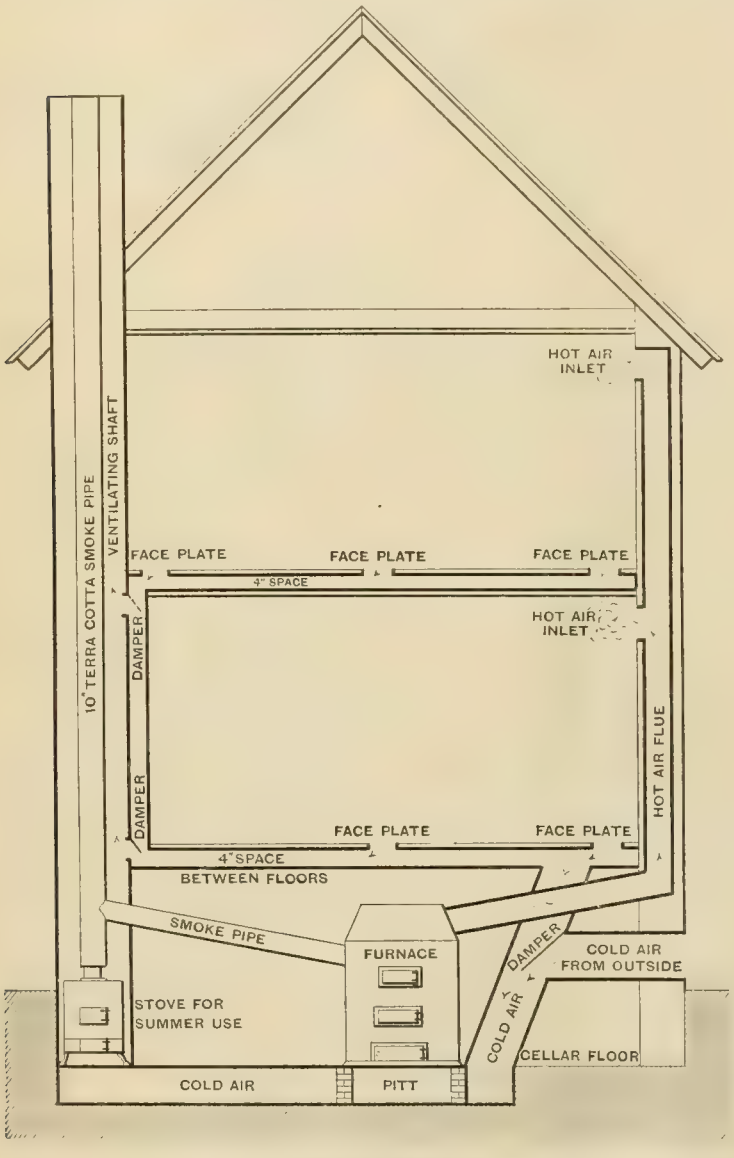


Fig. 2.—*The Usual Style.*

that it would not work he said he had held a burning match in the furnace pit and the air current did not blow it out. There has never been any fire in the furnace yet.

Note.—This appeal to our readers will no doubt receive the attention to which it seems entitled. The advantage to be gained by following the plan in Fig. 1

is insignificant and is not worth any extra trouble. Any deficiency in the air supply will result from lack of capacity rather than the plan of constructing the duct. The duct should have ample capacity and should be air tight so that the entire pressure will bear on the air that is heated and rising in the furnace. A damper in the duct will readily reduce the supply when it is too great. No doubt our correspondent can take his customer to many places in his city where satisfaction attends the use of a duct such as he has provided. In *The Metal Worker* of March 18 and April 1 he will find illustrations and descriptions for building ducts on the plan he has used.



A Heating System.

A Heating System.

From G. P., *Victoria, B. C.*—I inclose you a rough copy of my plan for heating and ventilating a school house, and would like your opinion of it and that of your readers.

Note.—No description coming with the sketch, some desirable information is lacking from which to form an opinion. The idea conveyed by the sketch has considerable merit, and if properly carried out in detail the work should prove satisfactory. The damper in the cold air box is so arranged that the outside air can be temporarily shut off, and by closing the ventilating registers at the same time the air will circulate through the building and furnace until the desired temperature is reached. The registers should then be opened and the damper arranged to take air from out of doors. A janitor in charge of such a system should have strict orders never to run it on the circulating plan when the school is in session. It is improbable that so many face plates will be needed in the floor, and the registers connecting the exhaust ducts with the ventilating flue should be properly proportioned in size to the heating registers. The necessity of the stove in the ventilating flue may or may not be felt. As our correspondent suggests, the plan is subject to further comment.

Boiler Connections.

From S. H. D., *Watkins, N. Y.*—I notice a good many suggestions in *The Metal Worker* as to the proper manner of making range boiler connections. Allow me to say that if a boiler is treated the same as a hot-water radiator and the connections made in accordance with the rules for hot-water heating the boiler can be placed anywhere in a building that a radiator could be placed with good results. The circulating pipe must be kept separate from the supply and distributing pipes. I have placed boilers in many strange and unusual positions, and have never failed in a practice covering many years to get good circulation.

Filtering Air Supply for Furnaces.

From CÆSAR, *Louisville, Ky.*—Filtering the air supply for furnaces depends altogether for its success on the situation. The use of cheese cloth on outside opening where the duct is in direct connection with furnace and outside opening is found to be very costly in numbers of cases for the reason that those in charge neglect to replace the cloth often enough, and the result is that the furnace and casing are ruined, besides the danger from fire resulting from an overheated furnace. It is found that under such conditions not less than 50 per cent. more air duct must be provided than is actually required by the furnace. The cloth should be renewed at least once every week, and if in a very dirty neighborhood twice a week. In such cases it is often difficult to get the best results. This is the case only when cheese cloth is used. The best results I have ever had are under the following conditions: When there is a good sized cellar, a cold-air room is constructed. The air duct from furnace is run underneath the cellar floor into cold-air room on the opposite side from the inlet for outside air. The mouth of this duct is raised not less than 5 feet above floor of cold-air room; in this box is placed the adjustable slide damper, and below it three slide frames covered with No. 18 or 20 wire cloth. The space in cellar between this box duct and outside opening is spanned by a number of wires, and these wires are hung with cloths of loose woven material reaching near the floor. It is a well-known fact that where soot comes in contact with cloth of any kind it will deposit a certain quantity with every contact. The wire screens should be cleaned with a broom at least once a week. I have found this arrangement to be the best that I have tried so far. To get the best results the cold-air room should be large enough to stretch a number of lines hung with the cloth strips.

Enameling Iron and Steel.

From S. H., *Massachusetts.*—Please inform me through *The Metal Worker* how enameling on steel and cast iron ware is done, or how granite ware is manufactured. Is there a patent on either of these processes?

Note.—The receipt books give various formulæ for enameling on iron, but we are inclined to believe that the process for the satisfactorily enameling of iron is not so easy that one can learn it by reading an article in a book. The various firms in this country who make enameled ware have their special processes for doing so. There is a double difficulty involved in the work. First it is necessary to get an enamel that will give satisfactory results, one that will be hard, impervious, unaffected by acids, and what is probably the most difficult of all things to obtain, an enamel that will expand and contract

with the metal itself, so that it will not crack off under changes of temperature. Granite ware is made by one firm, and, we believe, depends particularly on the preparation of the black metal, the effect of which is to give a mottled appearance to the finished article. A great deal of money has been spent in learning the process of enameling by the different manufacturers, and naturally they are not anxious to tell all that they have learned from experience and from the experience of others. Among the largest enamelers in the country are some who have worked out the process for themselves by a long series of experiments. This necessarily involves the expenditure of a great deal of money and a great deal of patience. If our correspondent, however, wishes to experiment for himself in this line, he might consult any of the well known receipt books, and, starting with their instructions as a basis, work out for himself a satisfactory application of the process.

Cleaning Foundry Windows.

From H. W. W., *New York.*—In answer to the query of "Iron Founder," in *The Metal Worker* of October 7 for some process of cleaning foundry windows, the following is given as having been found satisfactory in many large foundries and machine shops: A handful of oxalic acid to a pail of water. An important feature of the cleaning is to go over the glass with a woolen rag or soft skin and give it a polish, which will prevent dust collecting as quickly as it otherwise would. Glass cleaned and polished in this way will stay clean for a longer time than if left unpolished.

From IRON FOUNDER, *New York.*—In answer to the inquiry of "Iron Founder" Chicago, in *The Metal Worker*, I have used dilute sulphuric acid followed by a scouring with a mixture of fine sand and soft soap for cleaning foundry windows. I have seen windows that were very rusty and dirty made quite presentable in this way. While I do not consider this a positive success I know of no process which is better.

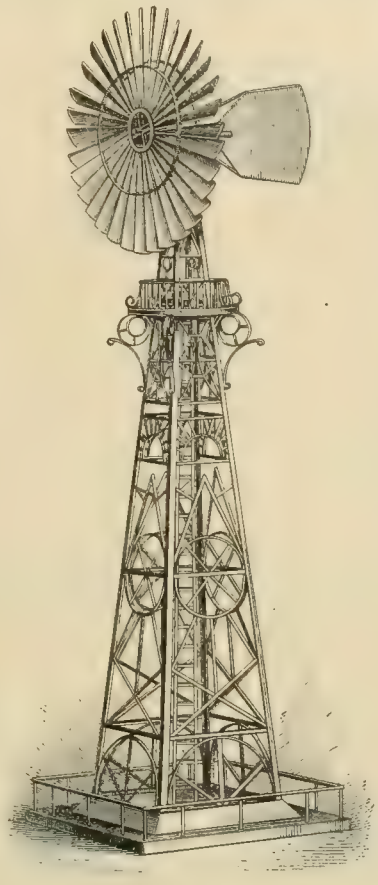
From CÆSAR, *Louisville, Ky.*—In answer to "Iron Founder" in *The Metal Worker* of October 7, the windows of a foundry may be cleaned quickly and perfectly by using parting sand (sand that is brushed off the castings) mixed with a weak solution of sulphuric acid and water. Brush this over the glass and allow it to remain for a few minutes, then finish with more of the same mixture. I have used this method of removing the oxide of iron and emery from the windows of the polishing room and foundry for years with success. The acid softens the iron, which is removed by the friction of the sand.

Water Heater for Cattle.

From HENRY H. LOVELL, 308 *Lugrare street, Grand Rapids, Mich.*—I notice the inquiry of "O T. B.," Clinton, Mass., in *The Metal Worker* of September 9 in regard to water heaters for stock. I have made three and own the patents on the same. They work well and are good sellers. I should be glad to hear from your correspondent.

Tin Wind Mill.

From A. S. CAMPBELL, *Cedartown, Ga.*—I send to *The Metal Worker* a photograph of a wind mill which I built recently. It is made entirely of tin, except the base, which is a board 19 inches square covered with tin. It stands 5½ feet high to the top of the wheel, which is 19 inches in diameter. The tower is 12 inches square at the base and is 4 feet 8 inches high. A ladder is built inside of the tower, up to the platform. The wheel operates exactly the same as a large one and works with a very light breeze.



Tin Wind Mill.

Note.—From the photograph sent the illustration given has been made for the benefit of our readers, as it shows a very clever piece of workmanship.

Gas Tar for Roof Paint.

From G. M., *Camden, N. J.*—Please inquire of "E. E. P.," New Haven, Conn., whose communication appeared in *The Metal Worker* of October 7, or examine the sample piece of tin sent to you, and see if it has a coat of some other good paint under the coat of tar that would prevent the acids of the tar from reaching the surface of the tin. It seems to be reasonable that if the smoke and gases arising from soft coal have the effect to rust out the tin from the under side, the gas tar made from the same material should have the same effect on the top side. I know from experience that pitch preserves tin, but not gas tar.

Note. — Close examination of the sample and scraping discovers no paint under the tar, which is thick and tough, with the tin in good condition.

What Size Boiler?

From C. E., *Paterson, N. J.*—Will *The Metal Worker* please let me know what horse-power horizontal tubular boiler will be required to heat a school building 74 x 105 feet, that is exposed on all sides to the weather and has 7000 feet of glass surface?

Note.—A heating engineer would require more information before attempting an answer. However, to give some idea of how to arrive at a conclusion, what is deficient has been assumed. A building 74 x 105 feet, with 7000 feet of glass surface, would probably be three stories high and have ceilings that would give the building a hight of at least 40 feet. Such a building would contain 310,800 cubic feet, and figuring on 1 square foot of radiating surface to heat 100 cubic feet of space, 3108 square feet of radiating surface would be required unless the air in the rooms was to be changed frequently, when more would be required. Some authorities say 1 square foot of boiler surface will be required for every 5 square feet of radiating surface, so by dividing the 3108 by 5 it is found that 622 square feet of boiler surface will be necessary to do the work. The same authorities say that 16 square feet of boiler surface for heating are equivalent to 1 horse-power, so by dividing the 622 by 16 it is found that a boiler of about 40 horse-power will be required for the assumed building. We are aware that the cubic contents rule is not at all reliable, but our correspondent has not furnished sufficient data to calculate the boiler capacity on a basis of glass area and exposed wall.

Check Valves and Steam Heaters.

From INQUIRER, *New Jersey.*—Will you kindly give the readers of *The Metal Worker* a half column touching the use of check valves on ordinary domestic steam heating plants? Are they necessary? Are they necessary sometimes? Why?

Note.—An opinion seems to prevail at present that a check valve is unnecessary in a well erected heating plant—that is, one that has a positive pitch or inclination from the boiler to some point and from that point to the boiler. In the past it was the custom, still followed by some, to use a check valve on the return to the boiler, then in case of an air pocket or a rapid condensation creating a vacuum, or too rapid a reduction in the size of the mains, a pressure in the boiler could not drive the water out of the boiler up the return. An objection to the check valve is the possibility of its becoming shut fast from corrosion, and many practical men do not use them on their work. We will be glad to hear from our readers on this topic.

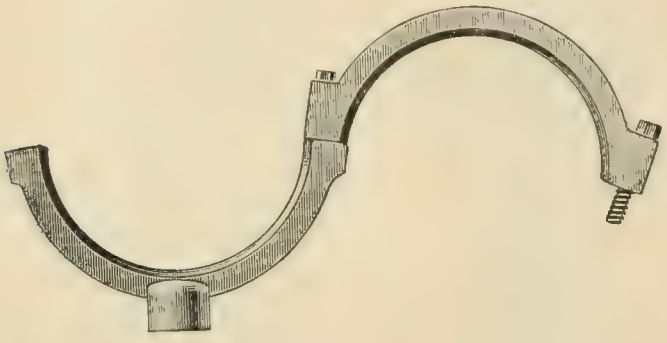
Tempering Small Springs.

From J. C. D., *Dyson, Ohio.*—What is the best way to temper small springs? Will some of the craft please answer through *The Metal Worker*?

PLUMBING and GAS FITTING.

Netherland Pipe Hanger.

The illustrations herewith show a pipe hanger invented by Alexander Bryant and put on the market by the John Simmons Company, 106–110 Centre street, New York. It was first used by Macdonald & Co., in the Hotel Netherland, New York, where the screw joint system of wrought iron pipe was employed for drainage. The hanger consists of a casting in two parts,



Netherland Pipe Hanger.—Fig. 1.—Showing Manner of Fastening.

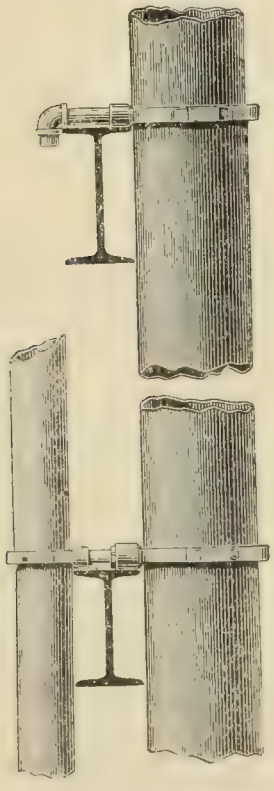


Fig. 2.—As Used with Girders.

as shown in Fig. 1, joined by set screws. An enlargement on one part of the hanger is drilled and tapped for iron pipe from ⅛-inch to 1¼-inch, according to the size. This enables sand hole fittings and short pieces of pipe to be worked up profitably. The hanger can be used to meet almost any requirement through the adaptability of pipe and fittings to various conditions. It will support or suspend the pipe or hold it at an angle from wood work, masonry or iron girders, as shown in Fig. 2. It is made in malleable iron for pipe from ⅛-inch to 4-inch and in cast iron from 3-inch to 6-inch.

The Leading Principles of Scientific House Drainage and Sanitary Plumbing.

BY WM. PAUL GERHARD, C. E.

The first principles of scientific house drainage and plumbing work are now well understood and little may be said on the subject that might appear new. Sanitary house drainage has been repeatedly and exhaustively discussed by leading sanitarians, yet the writer feels that—even at the risk of repetition of what he has said in former writings—the principles of safe sanitary drainage cannot be too often tersely stated.

There appears to be one reason in particular why it is desirable, in a publication like *The Metal Worker*, which reaches so many different classes of intelligent and interested readers, to dwell upon these principles. It is often asserted that different authorities on sanitation do not agree as to the fundamental requirements of sanitary house drainage, and that, this being the case, it is wiser to be distrustful. I contend most emphatically that this is not so, and my object in writing these pages will be sufficiently attained if I succeed in demonstrating the fallacy of this popular belief, and in convincing my readers that whatever differences of opinion may still exist refer rather to details of execution than to the principles which should guide us in the proper arrangement of plumbing and house drainage work.

It seems also desirable to state that, in the present article, I refer exclusively to the modern American plumbing and drainage practice. The English practice in laying out plumbing work, owing to differences in climatic conditions, differs from our own in many important particulars. Hence no greater mistake can be made than to apply the rules derived from English standard text books on plumbing and house drainage to works carried out in our own climate. Yet this is often done, particularly by people who, without practical experience and technical training, have acquired their limited knowledge of the subject merely by reading the English text books.

We may consider the drainage and plumbing system of a building as being composed of the following parts and subdivisions, viz:

1. The Pipe System—viz.:

(*a*) The sewer system, embracing the house drains, soil pipes, waste pipes and vent pipes.

(*b*) The storm water and subsoil water system, embracing rain water conductors, yard drains, area drains, cellar floor drains and subsoil drains.

(*c*) The disconnected pipe system, embracing safe wastes, tank or other overflow pipes, refrigerator waste pipes, boiler blow offs, tell tales, floor drains, discharge pipes from automatic cellar drainers, waste pipes from fountains in conservatories, &c.

(*d*) The supply system, hot and cold and circulation pipes, the cisterns, tanks, boilers, pumps, valves and faucets.

(*e*) The gas piping system.*

2. The Trap System.

3. The Fixture System.

In considering the principles which govern the scientific execution and arrangement of plumbing work, I shall endeavor to demonstrate their applicability to the above systems and subdivisions.

I —SOUNDNESS OF MATERIAL.

The first principle is the soundness of all materials used in the construction of the work. In other words, the pipes, the traps and the fixtures must be durable, strong, cleanly, non-absorbent and non-corrosive.

For outside house drains and sewers well glazed terra cotta socket pipes should be used. The pipes should be of the quality known as double strong, which comes in lengths of 3 feet, thus reducing the number of pipe joints and the incidental chances of leakage. One important feature concerning vitrified pipe is the shape and size of the socket, for upon it depends the strength and durability of the pipe joint. Until quite recently the pipe hubs were not manufactured of sufficient diameter and depth to enable the drain layer to insert a gasket of oakum and the proper quantity of Portland cement mortar, but now such improved pipe is being extensively manufactured and should be given the preference wherever first class work is expected.

All soil, waste, drain and vent pipes inside of a building should be of extra heavy cast or of heavy wrought iron. The cast iron pipe should be free from sand holes, cracks, flaws or other defects, the hubs of the pipes should be

* The gas piping is included in this article for two reasons. 1. Because the gas piping of a house is in nearly all cases executed as a part of the plumbing work. 2. Because it is quite important, from a health point of view, to have the gas pipe system sound and tight and scientifically arranged, although this matter is as yet hardly sufficiently appreciated by the general public.

very heavy and deep for calking purposes, and it is well to use only pipes and fittings which have been tested by hydrostatic pressure. With such "tested" pipe I can see no great risk in using tarred pipe, always provided the tarring is applied after the test has been carried out at the foundry, and for many reasons I prefer such tarred pipe, in particular for pipes laid underground, as well as for vent pipes and the extensions of soil and waste pipes.

The question of protecting pipes from rusting or corrosion is still more important in the case of wrought iron pipes used for house drainage purposes, and if the welded seams of wrought iron pipes are properly tested under pressure at the pipe mills I can see no good reason why they should not be protected by asphalting or by the rustless process. Plain wrought iron pipe, owing to its extreme liability to corrosion, is certainly not well adapted for underground sewage pipe conduits, nor is it at all advisable to use such plain wrought iron pipe for vent pipes in buildings.

The principle of soundness of material requires also that all the parts of a pipe system be of a uniform character, hence vent pipe extensions above the highest fixtures should always be of the same material as the flow pipes for sewage, and vertical soil and waste pipes should be as heavy as the pipes used for the horizontal portion of the main house sewer system.

Where lead is used for waste or vent pipes it should be heavy drawn lead pipe. Where the waste and vent pipes at fixtures are of brass, heavy brass pipe, and not the light tubing, should be used, and care should be taken to have the interior diameters of such pipes of the full bore required,

Particular attention should be paid to the brass ferrules required to join lead and cast iron pipes. Extra heavy brass thimbles should be used, and being cast must be carefully inspected for sand holes or flaws.

The lead used for calking cast iron pipe joints should be pure pig lead cast in bars, and no old lead piping liable to contain solder or impurities should be taken for this purpose.

Soundness of materials is also required in the supply pipe system. Heavy lead only should be used for supply pipes, or else wrought iron pipes, protected against corrosion by galvanizing, enameling, asphalting or by a rustless process. Annealed tinned brass pipes constitute an excellent material for the supply pipes of a house.

In connection with the supply pipes it is quite important to use only valves and shut offs of a superior quality of steam metal and of the best makes, and the same is true of the faucets for fixtures, whether self closing, ground key or compression bibbs are chosen. Economy in this respect is always dearly bought.

Where a superior job of gas piping is desired, galvanized wrought iron pipes should be used, and under all circumstances, even with plain wrought iron piping, it is advisable to use galvanized malleable fittings.

Traps for fixtures may be of lead, brass or iron, or else in many forms of water closets are molded in glazed earthenware and form part of the bowl. Drawn lead traps are superior to cast lead traps, and where the latter are used they should be tested for sand or pin holes. The same precaution is advisable in the case of cast brass traps. Where it is necessary to use iron traps under water closets or other fixtures, the inside of the traps should be white enameled to insure a smooth surface and to avoid corrosion.

The principle of sound material applies equally to the fixtures used in house drainage work. Porcelain or a good quality of white glazed earthenware and yellow stoneware are the materials most suitable for plumbing appliances from a sanitary point of view, although annealed glass, if obtainable, would be preferable for many purposes. The manufacture of enameled iron ware has now reached a high state of perfection, and fixtures of this material, being less heavy and less expensive, are extensively employed. Marble and slate, soapstone and artifical stoneware are suitable, as are also white metal, German silver, planished or nickel plated copper. Wooden fixtures are no longer used in good work, because wood, if alternately wet and dry, will soon rot, and because its pores absorb organic matters and become foul in a very short time.

II.—PERFECTION IN WORKMANSHIP.

The second principle requires perfection in workmanship, whether in the many forms of joints used in plumbing work or in the manner of fastening and supporting pipes, or in the proper run, alignment and grade given to the pipes for water, drainage and gas service. Without this perfection in workmanship the objects of a well-planned system of plumbing will not be attained in spite of the use of sound and good material. Hence the importance of making all pipe joints absolutely tight, whether the joint be a calked, screwed or soldered joint, and whether the pipe conduit be employed for the conveyance of water, gas or fouled organic wastes.

Leaky joints in water pipes may cause damage to decorated ceilings, wall hangings, floor coverings in a dwelling house and in warehouses, stores and office buildings may injure the goods stored therein, or destroy important documents. Leaky joints in the gas pipe system may destroy plant life, or injure book bindings and picture frames; they may also cause ill health and suffering and sometimes death by asphyxiation; at other times dangerous gas explosions and destructive fires may result. Leaky joints in the soil, drain, waste and vent pipe system, aside from the annoyance of foul odors, are the frequent cause, by the introduction of disease germs, of sickness and death in many a household.

The tightness of all pipe systems in a house is, therefore, a matter of the greatest moment, and should be ascertained not only before a building is completed, but also from time to time after it is occupied, by proper tests, to which I shall refer hereafter.

All joints on the sewer side of traps require particular attention. Thus in all forms of water closets or other fixtures where the trap is molded in one piece with the bowl and set above the floor, the floor joint should be very carefully made. Care should also be taken to set all fixture traps perfectly level.

All iron pipe lines should be properly supported to prevent settling or sagging of the pipes, and the supports should be very strong, preferably of wrought iron and firmly attached to the walls, floors or ceilings. House drains should be supported on brick or concrete piers at suitable distances. Heavy lead pipes are particularly liable to sag and should always be supported on continuous boards. All pipes of the water, gas, drainage and roof water system should be arranged as direct and straight as possible.

All branches in the drainage system should be Y-branches and all changes in direction must be made with curves of a large radius. Sharp curves and right angled connections are quite objectionable because tending to cause accumulation and ultimately stoppages.

The importance of employing only the best skilled labor for such work cannot be overestimated. As regards the best way of doing new plumbing work, whether by day's labor on a fixed percentage basis, or by contract work, for a stipulated sum, much may be said on both sides of the question. If an owner chooses for the work a contractor of good standing and unblemished reputation, who is personally known to him, and if this contractor has in his employ a reliable foreman and competent mechanics, a good job may be secured at a fair and not excessive price if carried out by day's work.

An equally good job may, however, be obtained in many cases if the work is given out by contract, provided the owner has beforehand settled all questions of fixtures and arrangement, and also provided the work is done in accordance with carefully drawn plans and specifications under the superintendence of some qualified disinterested expert of reputation, and provided, finally, a few judiciously selected and reliable firms of equal standing are invited to estimate on the work.

Where the contractor is not known to the owner or architect it is always better to have the work done by contract for a fixed sum agreed upon.

Where bids for work are publicly advertised it is generally unsafe to give the contract to the lowest bidder.

III.—SIMPLICITY IN ARRANGEMENT.

A third principle is simplicity in arrangement, and this requirement applies not only to the work as a whole, but also to its different parts, to the soil pipe system, the supply system, the trap system and the fixture system. This requirement is of the utmost importance and should ever be borne in mind from the conception of the work to its final execution.

It means that plumbing and drainage work must be carefully planned so as to secure as much compactness and directness as possible. It signifies that plumbing fixtures should be concentrated and located as much as possible directly in vertical groups, in order to avoid a useless multiplication of soil pipe stacks and the increased risk incident to a wide distribution of plumbing fixtures.

This principle, furthermore, requires that the number of fixtures or of outlets into the drainage system be reduced to the minimum of necessary fixtures, and that all long horizontal lateral branches be avoided, by placing the needed fixtures as close as possible to the main line of soil pipe.

The plumbing work of a house should not be scattered, but be confined to the toilet room, the bathrooms, the kitchen, butler's pantry, scullery and laundry. Plumbing fixtures should be abolished in living rooms, as well as in the cellar of the house. The sink which receives the disconnected pipe system is the only fixture which should be placed in the cellar.

I am not at all in sympathy with the modern tendency of making plumbing work elaborate, costly, and in every way complicated. The simpler a system can be laid out the better, in my judg-

ment, will it be. Thus it is objectionable to have several lines of vertical soil pipes where, by a slight change in the location of some fixture, a single line would answer the purpose. In like manner, one water closet in frequent use is preferable to two or three, each used only at rare intervals.

I should likewise avoid any complicated system of water service distribution necessitating running supply pipes horizontally across floors and over decorated ceilings. The proper place for the water distribution of a house is at the cellar, or, better, at the basement ceiling. The branch supply pipes in bathrooms should be kept in sight, and run above the floor along the walls. I should aim to make the whole supply system as simple as possible, and should avoid, in the hot water service, the usual complicated double boiler system.

In the trap system all double trapping on the main drain and at fixtures, particularly at water closets, and all manner of complicated trapping devices are objectionable. A good rule to bear in mind is that the trapped waste from a fixture should not pass through another trap before reaching the soil or waste pipe.

Where a simpler system can be arranged just as safely, I should not favor the back venting of traps, because it adds all manner of complication to the work, because it renders the work vastly more costly, and because it adds new dangers and thus makes the plumbing work less safe than expected. I shall refer to this point once more when speaking of trapping. The back air or double pipe system is sometimes made still more complicated by adding a third pipe system—namely, the local vent pipes carried from the house side of traps to some heated flue. While this method can undoubtedly be made to work quite efficiently, it seems hardly necessary where proper ventilation of the rooms containing exposed and accessible plumbing work is provided. Simpler methods of soil and vent systems than at present required in most plumbing regulations are much to be desired.

Lastly, the utmost simplicity should be observed in the fitting up of plumbing fixtures, and all kinds of complicated apparatus should be avoided as being more expensive in first cost, less efficient, and quite costly in maintenance and repairs.

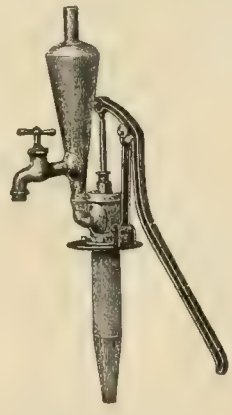
(*To be continued.*)

In a recent report to a local board of trade in England, there appeared the following item respecting cements for earthenware pipe: "There are many inventions for making the joints of stoneware pipes water tight, but as some of them are at present monopolies, I refrain from alluding to them. I will, therefore, merely mention the 'Stanford' form of joint, which any builder can easily make on the ground, or can obtain ready made from manufacturers. The composition used in Stanford's joint is composed of one part of boiled tar, one part of clean sharp sand and one part and a half of sulphur. The sulphur may be increased to one part and three quarters, if it is desired to make the joints harder for the purpose of carriage, &c."

John C. Savage has opened a plumbing shop at 70 West River street, Hyde Park, Mass. He served several years with Meade & Rossmann of New York, and afterward with John N. Tucker & Co. of Boston.

Flange Force Pump.

The accompanying illustration shows a flange force pump intended for securing to a shelf and which is manufactured by S. Wilder & Co., Holliston, Mass. These pumps are made of 32-ounce copper, and are recommended by the manufacturers for any purpose required of a house pump. The entire iron



Flange Force Pump.

work is malleable. In the illustration the pump is shown with the upper air chamber applied. These pumps are made in three sizes, with a diameter of 2½, 2¾ and 3 inches.

TRAPS AND VENTS.

The Associated Master Plumbers of Victoria, Australia, at their July meeting, adopted a proposition that the association should engage lecturers in order that members might qualify themselves for passing whatever examinations might be required for registration.

The rules and regulations governing the Utica, N. Y., plumbers have gone into effect, and Plumbing Inspector McKeough is busy sending out notices to plumbers who have passed their examinations that they must secure licenses at once.

From the Lalance & Grosjean Mfg. Company, 19 Cliff street, New York, comes a 12-page pamphlet under the date of October, 1893, devoted to kitchen sinks and plumbers' goods. These goods, they say, are pressed from single steel sheets, presenting round corners, and are so strong that there is no danger of breakage in shipment. They are furnished plain, painted, galvanized or enameled, and provided with the most approved styles of couplings. The line embraces several styles of kitchen sinks, pantry sinks, washbowls, drip trays and laundry tubs. Seamless enameled wrought steel kitchen sinks is the line to which they invite special attention, and any plumber who has not received a pamphlet should send for one. Plumbers' ladles and the "L & G" retinned wrought steel gas pipe straps are other lines that are displayed.

The recommendation for the appointment of Sewer Engineers Manson and Grunsky to superintend the building of some new sewers in the outlying sections of San Francisco, Cal., is said to have met with some opposition from the politicians, who wish to use the patronage for their interests in the fall elections.

The Board of Examiners of Plumbers, at Boston, recently met at 12 Beacon street and organized, with Dr. S. H. Durgin as chairman and Capt. John S. Damrell and William S. Mitchell as other members of the board. All future applications for examination will be attended by this board.

At a recent meeting of the Board of Health of Detroit, Mich., Dr. McLeod submitted to the board a detailed proposition relative to the organization of the Bureau of Sanitation, to be created under the new health law. The bureau is to be composed of the Health Commissioner, Chief Inspector of Plumbing, two assistants, the Sanitary Expert and the Board of Examiners for the plumbers and a clerk. The bureau will have control of plumbing, drainage and ventilation of public buildings, and all plans of new buildings will be submitted to it.

In the absence of President Byron Parker, J. Frank Kertz presided at the last meeting of the Board of Supervisors of Plumbing and Plumbers, at Hudson, N. Y. The other members present were: H. A. Feroe, William H. Hudson and J. Ganley, inspector.

Plumbing Inspector Lapsley of Salt Lake City, Utah, in one week issued five plumbing permits, one sewer permit, inspected 17 jobs of plumbing, and condemned one.

The State Board of Health of Connecticut recently investigated the sanitary condition of the state prison, and they report that while the general sewerage and sanitary arrangement was good, there was no plan showing the location of the main sewer and no manholes by which the sewer may be flushed and obstacles removed. Some of the closets in the outbuildings were in bad condition. The recommendation was made that the work be put in first class order.

The delegation of plumbers who visited Wilmington, Del., to organize an association of master plumbers in that place was composed of president Finnerty of Boston and vice-president Mitchell of New York, of the National Association of Master Plumbers; H. G. Gabay of New York; Thomas Radcliffe of Brooklyn; John Trainor of Baltimore; John Eyanson, William Harkness and John E. Clark of Philadelphia, who stopped at the Hotel Willis.

President Daniel G. Finnerty of the National Association of Master Plumbers was busily occupied last week. On Thursday afternoon he organized an association of master plumbers in New Bedford, Mass., on Friday morning an association at Brockton, and in the afternoon still another at Taunton. He was accompanied by David Smith, recording and financial secretary of the National Association.

The Monitor Iron Works, at 76 and 78 Centre street, New York, have been running both of their foundries full time to fill their orders for plumbers' cast iron goods.

President Finnerty and Secretary Smith of the National Association of Master Plumbers recently visited Fall River, and preliminary steps were taken for the organization of an association of master plumbers. P. C. Fogwell was elected president and Michael Donovan secretary of the temporary organization. A committee was appointed to wait upon the plumbers of the city in order to have a full representation in the association. When the roll of membership is complete a permanent organization will be effected.

THE PROTECTION COMMITTEE of the Master Plumbers' Association of New York are submitting to the manufacturers and dealers in plumbers' goods a paper that is said to be even more stringent than the "Baltimore resolutions" in its protection to the interests of all concerned. The paper has been well received generally and a number of signatures have been obtained, though the entire trade have not as yet indicated their position.

HEATING AND PLUMBING.

NEW WORK AND CONTRACTS.

R. D. MASON was the successful bidder for putting a steam heating apparatus in the Gill Building at Alton, Ill. The price reported is $549. He has just completed the installation of a steam heating plant in the new residence of Mrs. Laird.

IN SECURING THE CONTRACT for ventilating and heating and installing a system of crematory dry air chests in a new school building in Cincinnati, Ohio, the Bennett & Peck Heating & Ventilating Company of that city have been awarded the fourth contract for work in the city's public buildings recently.

LUCAS & RUHAAK of Pekin, Ill., are putting a steam heating apparatus in Ehlicher's drug store.

C. H. KNELLY of Cunningham, Pa., has secured the contract for setting a large steam heating boiler in the new isolating ward at the Pennsylvania State Hospital.

THE SCHOOL BOARD of Lynchburg, Va., have contracted with the Bennett & Peck Heating and Ventilating Company of Cincinnati to put their system of heating, ventilation and dry closets in a new school building.

THE RICHMOND STOVE COMPANY, Norwich, Conn., report that the contract for heating in the St. Hyacinth R. C. Church at New Bedford, Mass., has been awarded to Abraham Knowles, who will use two Richmond sectionals; that W. A. Putnam, Warren, Mass., has just completed a heating plant in the Brookfield, Mass., Public School Building, using a Richmond sectional. George T. Barnes will use a Richmond sectional to heat St Luke's Hospital, at Newburgh, N. Y., and will also use one of the new 320 series of Richmond sectionals for heating the court house at Newburgh. E. H. Randell of Concord, H. H., is placing one of the Richmond sectionals in the cutlery works at Antrim, N. H. A No. 66 Victor will be used by W. R. Park & Son for heating the Winthrop Club Building at Taunton, Mass.

UP TO NOON of October 26 bids will be received for the plumbing, gas fitting, steam heating, galvanized iron and tin work, in the new Southern California State Asylum for the Insane and Inebriates, at San Bernardino, Cal.

MILLER & JONES of Fall River, Mass., have been awarded the contract for a heating apparatus in the Robinson School House at that place, at a reported cost of $3300.

THE CONTRACT for a steam heating plant at the Thomas House at Streator, Ill., was awarded to the Milford Heating Company.

THE COUNTY COMMISSIONERS of Ironton, Ohio, at a recent meeting instructed the auditor to ask for bids for replumbing the Infirmary.

WILLEY & CALHOUN of Portland, Maine, have been awarded the contract for placing the heating apparatus in the Public Library at Westbrook. They are also setting heating plants in the residence of Hon. L. D. Sweat and at the old homestead, at Saco River, of Miss Usher.

THE ROBINSON HEATING & VENTILATING COMPANY of Altoona, Pa., are installing a Florida steam heater in the new Quandt & Cherry Building, and a 25 horse-power portable boiler for the Altoona Hospital.

AFTER EXAMINING several systems of heating and ventilating school buildings, the Syracuse, N. Y., Board of School Commissioners have decided to award a contract to the Fuller & Warren Company of Troy, N. Y., for putting in the heating and ventilating apparatus of a new school house in Syracuse for $3000, which price includes their cremating closets.

SOME NEW HEATING CONTRACTS that have been secured by Rufe Brothers of Doylestown, Pa., are for the Fountain House and Hillyer's store, in that city, and the Fort Side Hotel, at Fort Washington, Pa.

W. M. MACKAY, 236 Water street, New York, manager of Hart & Crouse's steam and hot water business, reports the following recent sales of Royal heaters for use in public buildings: Queens County Bank, Long Island City, L. I.; St. Luke's Episcopal Church, Matteawan, N. Y.; Jonestown Church Home, Jonestown, Pa.; Reformed Dutch Church, Montgomery, N. Y.; Electric Car Barn, New Haven, Conn., Royal steam heaters, and Public School, Atlantic Highlands, N. J., and Public School, Milwaukee, Ore., Royal hot water heaters. In addition to a number of private cases they are furnishing steam heaters for ten greenhouses at Woodside, L. I., and eight Royal steam heaters for the Columbian Building Association, Paterson, N. J. All these cases are placed by local steam fitters in the different sections; Hart & Crouse stating that they do not contract for setting up any work themselves.

B. H. HILLIAR, New London, Conn., have the contract for new heating apparatus at Fort Trumbull, at the same place. Formerly stoves were used, but now four hot water heaters will take their place.

SEALED PROPOSALS will be received at the office of the Supervising Architect, Treasury Department, Washington, D. C., until October 31 for the low pressure steam heating and ventilating apparatus and reconstructing part of the old apparatus and furnishing a new power boiler for the United States Court House, Post Office, &c., building, Dallas, Texas. Drawings and specifications may be obtained from the Supervising Architect, at Washington, and at the office of the superintendent, in Dallas, Texas.

THE ILLINOIS HEATING COMPANY, 88 Lake street, Chicago, have contracts for hot water heating in the following buildings in Chicago and vincinity. The residence of J. H. Snitzler, Drexel Boulevard and Forty-fourth street; residence of E. V. Roddin, 57 Cedar street; residence of Geo. Rost, Lake View; residence of Dr. Beery, Michigan Boulevard and Forty-sixth street; residence of Max Tonk, 592 Fullerton avenue; apartment building of John A. Roche, Chicago; residence of Thos. Costello, Naperville, Ill.; residence of Truman Huling, Kankakee, Ill. The above company have also the contracts for steam heating in the following buildings: Apartment building of J. T. Mathews, Washington Boulevard; apartment building of F. J. Lange, Dening Court; residence of Mrs. Mayer, Grand Boulevard and Forty-second street; residence of F. W. Hamil, Hyde Park; offices of Fred. Miller Brewing Company, Western avenue; apartment building of Miss Helen Culver; apartment building of O. Brewer, Woodlawn. American radiators are to be used for the above.

THE L. H. PRENTICE COMPANY, 203 and 205 Van Buren street, Chicago, are putting in the steam heating plant for the New York Biscuit Company, Randolph, Carpenter and Morgan streets, Chicago.

THE BAKER & SMITH COMPANY, 193 to 197 Van Buren street, Chicago, have on hand one of the largest steam heating contracts lately taken in the United States, for heating the Bourse, Philadelphia.

A good story is told on Newburg, N. Y., by P. M. Moffat, now engaged in plumbing and hot water heating, at 436–438 Kent avenue, Brooklyn, and until lately an instructor at the Pratt Institute. It seems the water authorities of that town, from which originally our informant came, were puzzled at the insufficient delivery from one of their mains. They experimented more or less, and, as a last resort, sent to this city for a hydraulic engineer, now prominent in the Brooklyn system. The engineer journeyed to hilly Newburg and agreed to set matters right for $1200. He looked the ground over carefully, elevations particularly, and finally indicated a spot where a gang of laborers should be put at work sinking a shaft to the main. When they reached the big main it was tapped and the air bound pipe relieved of its large bubble of air that had accumulated at a certain high part of the main, reducing its capacity nearly one half. It could neither get one way nor the other, and until it was released there was no chance for more water. This happened 25 years ago; but the laws of hydraulics are the same now as they were then, though probably it would not cost $1200 to-day to locate an air trap.

Manual training is about to be introduced into the public schools of Brooklyn, a sum of $10,000 having been appropriated to this object by the Board of Education. This will defray the expenses of the first experiment in this direction, which will be in the shape of a manual school to be established in the Boys' High School, where the rudimentary principles of several trades will be taught to lads recommended by the principals of the schools.

Orders have been sent by the Navy Department to Rear-Admiral Belknap, at New London, Conn., directing him to send out the dynamite cruiser "Vesuvius" on the unique and hazardous duty of blowing up 14 derelict vessels that endanger navigation. All the derelict vessels to which the "Vesuvius" is assigned were wrecked during the recent hurricane on the Atlantic Coast, and nearly all are adjacent to the Jersey shore.

TIN PLATES.

Tin Plate Imports.

The Treasury statement of imports and exports of the United States, lately issued for the month of August, 1893, contains some interesting statistics in regard to the importations of tin plates during the past five years, as compared with those of the first eight months of 1893. The following tables exhibit the course of the trade during the periods referred to, and indicate a decided falling off in the value of imports of tin plates during the current year:

Imports of Tin Plates, Terne Plates and Taggers' Tin, in Pounds.

Quantities.				Values.			
Month ending August 31.		Eight months ending August 31.		Month ending August 31.		Eight months ending August 31.	
1893.	1892.	1893.	1892.	1893.	1892.	1893.	1892.
42,546,544	49,101,440	446,466,013	433,688,942	$1,142,842	$1,392,193	$12,307,056	$12,343,512

Comparative Summary of the Values in Dollars of Tin Plates, Terne Plates and Taggers' Tin Imported During the Eight Months Ending August 31, from 1888 to 1893, Inclusive.

Eight months ending August 31.					Average of the preceding five periods.	Eight months ending August 31.	1893 compared with—	
							Average of preceding five periods.	Period of 1892.
1888.	1889.	1890.	1891.	1892.		1893.	Increase + Decrease −	Increase + Decrease −
13,621,265	15,242,407	14,862,008	23,529,483	12,343,512	15,919,735	12,307,056	— 3,612,679	— 36,456

The decrease in the value of tin plate imports, shown above, for the first eight months of 1893, while the actual weight of plates imported increased by 12,777,071 pounds, indicates how remarkably prices of foreign tin plates have been lowered since last year. They are now, indeed, not only lower than they have ever been before, but they are actually almost down to the level of their prime cost, so that Welsh makers are naturally heard to complain of vanishing profits, and to declare, as many do declare, that it is more economical to close down their works altogether than to run them at the present unremunerative prices. The influence of domestic made tin and terne plates on the market appears to be conclusively shown in the very narrow increase of imports recorded. This is, doubtless, largely attributable to the recent financial depression, combined with an anticipation of approaching tariff changes, which have induced conservatism on the part of importers, and have made them naturally disinclined to carry any unnecessary stocks of foreign material under the present condition of the market. But when it is taken into consideration that last year's tin plate importations were exceptionally light, by reason of the large stocks that were laid in immediately prior to the imposition of the tariff in July, 1891, the narrow increase of this year's imports so far over those of 1892 tends to show that the supply must have been supplemented from some other source. There is no evidence that the consumption of tin plates has fallen off; conclusions, in fact, point in the opposite direction—namely, that the 100,000,000 pounds made in this country during the year ended June 30, 1893, was the source whence was drawn the balance of the tin and terne plates consumed in the United States during the first eight months of this year.

The Success of the American Tin Plate Industry.

The last report of Ira Ayer, Special Agent of the Treasury Department, says *The Iron Age*, shows that even at this early date the American manufacturers of tin plate have reached a state of development which brings them very near the attainment of the quantity called for by the tariff act. Even under the strictest interpretation of the law its requirements would now be met, if the financial panic had not interfered. Under the recent Treasury ruling only those tin and terne plates are counted as being American which have been made from black plates rolled in this country. The tariff act provides that the present duty shall stand if it can be shown to the satisfaction of the President of the United States that the American product of plates weighing less than 63 pounds per 100 square feet is equal to one-third of the importations in any one of the fiscal years up to June 30, 1897.

Thus far the year of lightest importations has been the fiscal year ending June 30, 1892. One-third of the net imports thus figure out 79,307,939 pounds. During the quarter ending June 30, 1893, the production of tin and terne plates from American black plates was 18,264,225 pounds, of which about 94 per cent. were plates weighing less than 63 pounds per square inch, or say 17,167,000 pounds. To this must be added, according to law, 2,322,455 pounds of tinned or terned articles made from American sheet iron or steel. This carries the total for the quarter, under the narrow lines fixed by the present Treasury officials, to about 19,489,455 pounds. If this rate is kept up for four successive quarters, covering a fiscal year, the American producers will have complied with the provisions of the act, because the product would be close to 79,000,000 pounds, which is the mark to be passed.

We know that full capacity had not been attained in the quarter ending June 30, 1893, although it did show an advance from 14,102,299 pounds to 20,586,680 pounds, comparing it with the preceding quarter. It is quite sure that if general business is in a normal condition the manufacturers of tin plate in this country can make from American black plates a sufficient quantity to meet the requirements of the law. The only point concerning which any doubt might possibly arise is whether our sheet mills are now in a position to readily supply the needed annual quantity of 75,000,000 pounds of plates lighter than 63 pounds per 100 square feet.

We took occasion recently to criticise the tables relating to capacity issued by the Treasury Department and printed in *The Iron Age* of September 14. The table then printed assigned to makers of tin plate from American black plates an annual capacity of about 30,250,000 pounds, based on three and one-half times the product of the quarter ending March 31. At the time of the publication of that article there were in the possession of the Department the sworn returns of the manufacturers for the last quarter of the fiscal year. These show an actual make of over 18,000,000 pounds, or at the same rate of figuring, by multiplying by three and one-half, an annual capacity of about 64,000,000 pounds, or double the estimate of the Treasury officials. We believe that no more evidence than this is required to show what means are resorted to by hostile officials to create impression adverse to a rapidly developing industry. We need hardly add that we do not hold Ira Ayer responsible for work so little worthy of Government officials.

Banka and Billiton Tin Statistics.

The Bureau of Statistics has published tables showing the quantities of tin produced in the Dutch East Indies. From the middle of April, 1891, to the middle of March, 1892, and during the years 1886 to 1891, the production of Banka was as follows:

Tin Production of Banka.

Districts.	Gross tons.
Muntok	260
Djeboes	700
Blinjoe	1,021

Soengeiliat	1,030
Merawang	696
Pairg Kalpinang	892
Soengeisleian	670
Koba	208
Toboali	278
Total 1891-92	5,755
1890-91	6,490
1889-90	5,431
1888-89	3,993
1887-88	5,110
1886-87	4,668
1885-86	4,631

The figures for Billiton are as follows :

Districts.	Gross tons.
Tandjong Pandan	355
Manggar	2,518
Linggang	1,905
Boeding	1,264
Dindang	342
Total year ending April 30, 1892	6,384
1891	5,842
1890	5,825
1889	4,795
1888	4,713
1887	5,400
1886	4,908
1885	3,759
1884	4,297

In the last year reported the number of hands employed in Banka was 7989, while the number was 8690 in the Billiton mines.

SCRAP.

A PATENT has just been granted to Geo. W. Jaques of the tin plate firm of A. A. Thomson & Co., New York, for an improved apparatus for coating sheet metal. The object of the invention is, in part, to attain two temperatures at the bath with one fire, and in part to provide simple means for regulating the temperature of that portion of the bath where the molten metal is covered with oil, and further to provide a construction of the bath which will enable the minimum amount of molten metal to be used. A chief feature of the apparatus lies in the arrangement of air flues for cooling the metal under the oil.

IMPORTS OF TIN PLATES by sea into San Francisco, Cal., during the half-year ended June 30, 1893, amounted to 21,400,730 pounds, or 159,361 boxes, valued at $611,198.

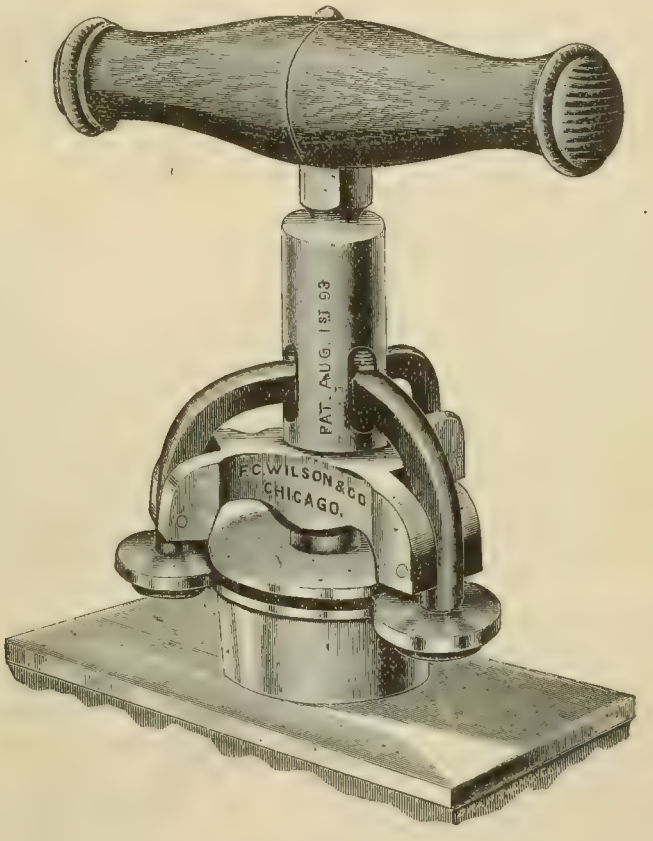
E. MOREWOOD & Co.'s large tin-plate plant at Gas City, Ind., is reported to be rapidly getting into shape for work in all departments. A portion of the tinning department has been under way for some time, and new pots are being started into work as they are installed, so that a large output of tin plates will be made within a short time. The cold rolls were recently put in operation, and other departments of the mills are approaching completion. The work of the establishment will, it is understood, be carried on under the personal direction of J. H. Rogers of the Morewood firm, who has recently arrived from Wales and proceeded to Gas City. Mr. Rogers' practical and theoretical knowledge of the art of tin plate manufacture is probably unrivaled.

THE WORKS of the Morlais Tin Plate Company, at Morlais, Carmarthenshire, and of Thomas, Lester & Co., at Carmarthen, are the latest additions to the list of Welsh tin plate works which have been closed down owing to the depressed condition of the market.

Connection was made last week on the longest telephone line in the world except that between New York and Chicago. It stretches from Spokane, Wash., to Portland, Ore., by way of Puget Sound, a distance of nearly 600 miles.

Nozzle Cap Crimper.

The illustration shown herewith represents a newly invented tool for crimping the caps upon the nozzles of varnish and other cans, being introduced by F. C. Wilson & Co., can and tank manufacturers, 239 and 241 Lake street, Chicago. It is claimed for this tool that it combines the lever and the wedge principle is so perfect a manner that little power is necessary in applying the caps, while the force exerted is so great that the nozzle and cap are joined so tightly that even the lightest liquids are perfectly retained. It will be seen from



Nozzle Cap Crimper.

an inspection of the engraving that three crimping rolls are mounted upon a corresponding number of levers. The central spindle of the disk which fits down upon the nozzle cap projects upward into the stock, and the ends of the levers which pass through the stock rest upon this spindle. When the tool is pressed downward the spindle presses against the ends of the levers, carrying the crimping rolls inwardly against the work, and by revolving the handle the edge of the cap is turned over. As the upper end of the spindle is oval and the ends of the levers are beveled, the wedge principle is brought into play, carrying the rolls against the work with great force. The handle is of wood, the stock of brass, the levers of machine steel, and the rolls of the best grade of tool steel. The whole is very simple in construction, and the claim is made that it is not liable to get out of order. The tool is the invention of F. Cortez Wilson of F. C. Wilson & Co.

The Bethlehem Iron Company shipped last week 64 tons of plate for the battle ship "Maine" to the national proving grounds at Washington. The plates are 8 x 15 feet, and 12 inches thick. These plates are the first service plates that have been Harveyized, and their trial will consequently be of interest.

Professor Bell on Aerial Navigation.

In the course of an interview recorded recently in Montreal with Prof. Alexander Graham Bell, that scientist and inventor declared his belief, amounting almost to conviction, that the flying machine would be an accomplished fact before the close of the century, or, at most, before the end of ten years. This great undertaking, he said, was no longer in the hands of "fakirs;" it was engaging the minds of practical scientists like Maxim, the inventor of the Maxim gun, and Professor Langley of the Smithsonian Institution. The great difficulty in the past was that inventors were on the wrong track. They had been vainly trying to make a flying machine on the principle of the balloon, lighter than the air. Such a machine could never be properly steered. The flying machine of the future would have greater specific gravity than the air. Of this Professors Langley and Maxim were convinced, and on this principle one or both will soon succeed. The machine need not have wings. Nature was not always a wise guide; the steam locomotive got on well without legs. Indeed, the rotary motion was the most economical.

Owing to the prolonged stoppage of operations at the rolling mills and blast furnaces in the Youngstown, Ohio, district, distress among the workmen is now reported, and public subscriptions are being raised for a relief fund. Generous amounts are being contributed.

ROOFING AND CORNICE.

The First Use of Sheet Iron for Cornices.

The first use of sheet iron for the fabrication of cornices and ornaments for buildings grew, says the *Ohio Valley Manufacturer*, out of an accident which occurred in Cincinnati in 1834. The accident that led to it was the fall of a heavy cornice stone that was being hoisted to its place on a high building. The stone in its descent crushed two men to death. The accident was witnessed by a sheet iron worker, who immediately began experimenting with galvanized iron and endeavored to shape it into a cornice. Being successful in this, a new field was opened for sheet iron.

The first cornice from this material was placed on the old National Theater in Cincinnati. New machinery was required for shaping cornices from sheet iron and Cincinnati also produced the firm that could design and make it. The predecessors of the firm now known as J. M. Robinson & Co. were appealed to, and they set to work at designing, and finally produced the first machine, which they called a cornice brake, and the first galvanized iron cornice was made on it. The later use of sheet and galvanized iron as panels, moldings, &c., for interior ornamentation was a natural evolution from the cornice and its allied branches of manufacture.

Deterioration of Zinc Work in Australia.

R. Gordon Hyndman, in a paper read a short time ago before the Royal Victorian Institute of Architects, in Melbourne, made the following observations in regard to the use of zinc for roofing and other architectural purposes in Australia: During the last few years in Melbourne the use of zinc has largely increased, both for ornamental purposes and, more commonly, for flashing. There are likely soon to be complaints as to the failure of this very useful but somewhat uncertain metal. It has been discovered on the Continent that where zinc work comes in contact with brick work the zinc pits and rapidly oxidizes and becomes brittle. Chemical tests show that the brick work itself contained 1.14 per cent. of soluble salts quite capable of producing these results, and that their action was stimulated by moisture. In other places zinc used for roofing and ornamental purposes has been found to deteriorate rapidly, especially in large cities, where coal is burned containing a percentage of sulphur.

Galvanized Iron Cornices.

We present in the accompanying illustrations views of examples of galvanized iron cornices made by W. H. Mullins of Salem, Ohio. The illustrations are taken from a recent small edition of Mr. Mullins' catalogue of cornices, building fronts and architectural sheet metal work. The cornice shown in Fig. 1 is 36 inches high, with a projection of 24 inches and a balustrade of 22 inches. Fig. 2 is 36 inches high, with a projection of 16 inches and balustrade of 28 inches. Fig. 3 has a hight of 45 inches and a projection of 23 inches, while Fig. 4 has the same hight and projection of 18 inches. These cornices are furnished complete and in as large sections as is convenient for transportation, with moldings, brackets and ornaments attached, so that only vertical joints are necessary. Furthermore, the different parts are marked and numbered so that

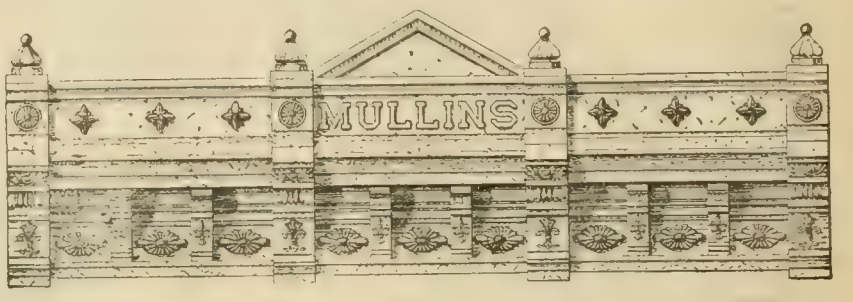


Fig. 1

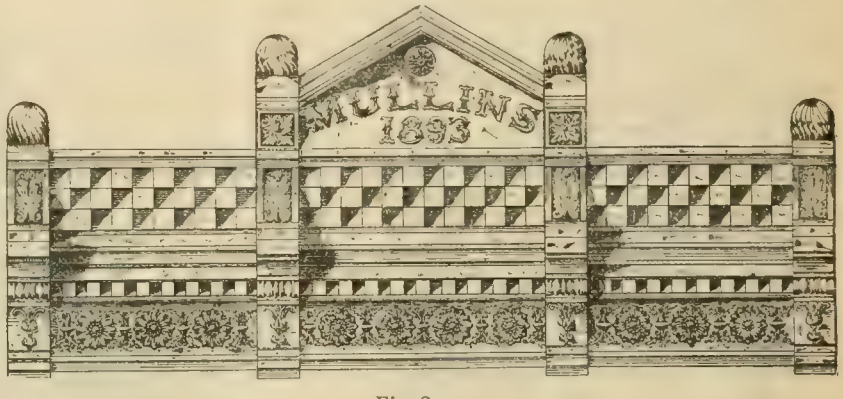


Fig. 2.

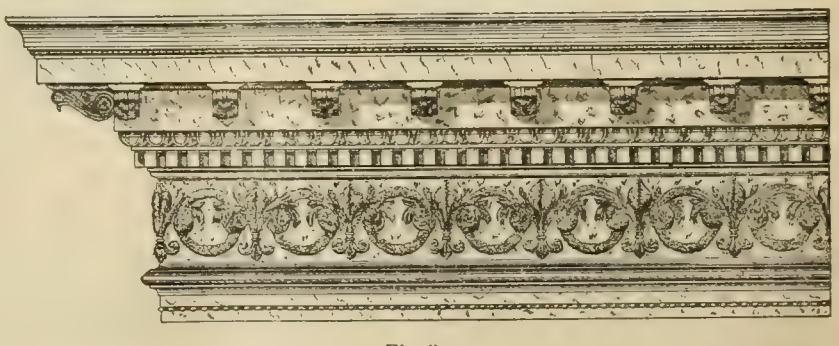


Fig. 3.

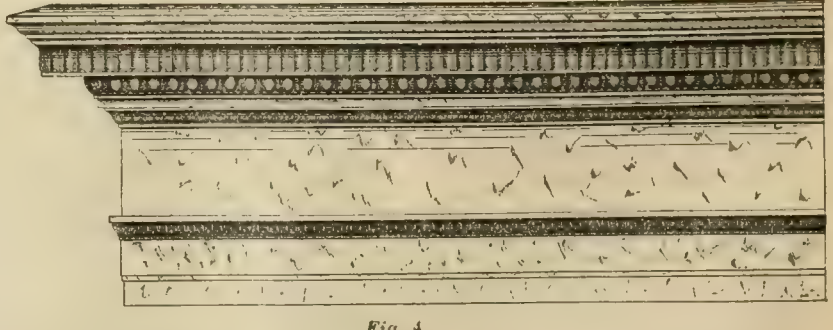


Fig. 4.

GALVANIZED IRON CORNICES.

by the aid of construction drawings and printed instructions, which are furnished with the work, they can readily be put on the building. The cornices are of galvanized iron, but can be made in copper if so desired.

Roofing Slate in California.

The fact that there is a growing demand on the Pacific Coast for slate roofing cannot be questioned, says the *California Architect and Building News* in a recent issue. In view of this it is but fair that we present at this time a few facts concerning a material which in the Eastern States, as well as Europe, is used almost exclusively for covering roofs. Our earliest building on this coast was of such a temporary character that no thought was given to how long the roof covering would last. The cheapest (first cost) most convenient material at hand would be selected and on it went. In a year or two if the roof leaked on went another, or the old one was patched up to try and outlive another winter. In a few years the roof had cost twice as much as would have covered it in the first instance with a material that nature has given us and which will not wear out for many years. Yet to bring slate from the East meant a very expensive roof, and only a few could afford to use the material. Not so to-day, for the opening of the slate quarries of El Dorado County, in this State, has put the material within the reach of every one. Again we have entered a new era in the building line. Our architects are being called upon to design structures composed of steel, iron, brick, terra cotta and stone, and such as will compare with any buildings in the world. This is what is causing a demand for slate. Our architects, if allowed, will have a material on the roof that will be in keeping with the rest of the building. The earliest use of slate for covering roofs (of which we have any record) was in the twelfth century. The old castles of North Wales at Carnarvon and Conway were covered with slate. Also the castle at Augers, France, built in the vicinity of the slate beds that are now being largely quarried underground. When Edward I visited the copper mines of Drwysyeold, in North Wales, he stayed at a house in Nantlle roofed with slate. On the mountain slopes of North Wales on several of the slate ranges are traces of old workers, and the tracks along which they carried the slate on their own backs, or the backs of their horses, are still discernible and form part of many a mountain path. In an ode written by a Welsh poet in the year 1570 we find the first mention of the Penrhyn quarries. The bard Sion Tudor asked the Dean of Bangor for a load of slate from the Caehier quarry. The Aberllefeni quarry is as ancient, for an old timbered house is said to have been covered with slates from the quarry in the days of Queen Elizabeth. About the same time the slates from the De la Bole quarries, in Cornwall, had attained considerable repute. Carew writing in 1602, describes them as "in substance thinee, in color faire, in waight light, in lasting strong, and generally carrieth so good regard as (besides the supply for home) great store is yearly conveyed by shipping both to other parts of this realm, and also beyond the sea into Britaine and "Netherlands." Speaking of the same quarry in 1758, Borlaise writes that for its lightness and enduring of weather it is generally preferred to any slates in Great Britain. He describes the great quarry as in his time 300 yards long, 100 yards wide, 80 yards deep. It is evident from the size of the quarry that a considerable quantity of slates had at that date been extracted from it.

The growth of the slate trade in Europe within the last 25 years has been something enormous, and may be spoken of as one of great prosperity, limited only by the ability to supply the demand. Merchants there are ready to contract for the whole output of good quarries. Aside from this, during the year 1892 New York alone exported to the British Isles 2,122,065 roofing slates; notwithstanding the great number of quarries in operation in Wales and the thousands of men employed in the production. . . . Until a few years ago all the slate used on the Pacific Coast come from the East, but to-day the County of El Dorado supplies most of the slate used in California. The quarries of this county seem to be the only deposit in the State that could be used for roofing, as the material for this purpose must have good cleveage qualities, or rather be such as will allow of its being split into sheets. California produces a slate of such quality and color as will compare with any produced in the world, and it can be bought for one half the cost of Eastern slate landed here. The fancy colored slate is fast going out of use, the demand being for black slates, and rightly so, for nothing can be more handsome than a plain black roof, particularly for our modern style of architecture.

A roof strong enough for shingles will hold slate. It is fire proof, and when laid properly the elements have no apparent effect. It will not absorb water nor hold snow. There are many instances where slate has been taken from a building on which it has been for 75 to 100 years and relaid on another.

Assuming the life of the various kinds of roofing to be as described in the following table, it will be seen that while the first cost of slate is somewhat greater than other materials, it has a very great advantage at the outcome:

Material.	Original cost per square or 10 x 10 feet.	Life.	Avergage cost per annum.
Slate	$10.50 to $11.00	100 years.	10 5-100 or 10 10-100 cents.
Tin	8 50 to 9.00	15 years.	66⅔ or more cents.
Corrugated Iron	8.00 to 8.50	10 years.	80 or more cents.
Shingles	4.00 to 5.00	12 years.	33⅓ or more cents.
Boards	2.00 to 2.50	8 years.	25 or more cents.

In above estimates we have made no allowance for painting the tin, iron or shingles. If these materials are not painted regularly and well, they will not last the time given.

To the owner or landlord no portion of a building is so great an expense to keep in repair as the roof, nor so great an annoyance to a tenant as a leaky one. Slate is always sold by the square, which is 10 x 10 feet, or 100 superficial feet. Let us have more slate roofs on this coast and the result will be that we shall have fewer fires, cooler houses in summer, warmer in winter, and last but not least, less expense for repairs.

FLASHINGS.

The Acme Roofing Company, Canton, Ohio, issue a handsome illustrated catalogue and price-list of their manufactures. The volume contains 90 pages, and is bound in heavy scarlet paper with the firm name and address in raised gilt lettering. The style of publication is excellent, the engravings being clear and the printing good. The first articles noticed are eave troughs and gutters, together with hangers, &c. Next come conductor pipes and heads, followed by elbows, cut offs, ventilators, &c. Several pages are given up to ridgings, cresting blocks and finials. Cornices of various styles are also shown, and a number of pages devoted to ornamental finials. The roofing section, which follows, relates to Acme standing seam roll cap roofing, corrugated roofing, crimped siding, corrugated iron, beaded iron, &c. Also metal ceilings and pressed brick. This is followed by illustrations of fire proof doors and shutters. Instructions are given for ordering roofing, siding, &c., and at the end various miscellaneous supplies for roofers are noted.

Zigzag corrugated iron is a suggestion made in the London *Ironmonger* as a material for house construction. The section recommended is a zigzag in which each rib forms a dovetail, so as to serve as a key to plastering, which would thus make the house cool.

One of the cheapest, simplest and most efficient devices for the protection of shingle roofs from fire is mentioned by *Fire and Water* as being introduced in some cities. It consists of nothing more than a water pipe running along the ridge board of the roof and connected with the water service of the building. The roof pipe is perforated at short intervals, so that at a moment's notice the roof can be flooded and rendered impervious to sparks and blazing fragments blown from burning buildings in the neighborhood. The device is at once so simple and effective that one wonders why its introduction was not coeval with that of water mains and hydrants.

Bruce & Cook of 188 Water street are the New York agents for the Hastings quadruple roofing folder described in *The Metal Worker* a short time since. The machine turns the edges on all four sides of a sheet of tin and leaves it square when used for sheet-at-a-time flat seam roofing and by a simple change turns two edges for forming rolls of tin for standing seam work. It has made a favorable impression on the trade and those sold have proven highly satisfactory.

The first consignment of corn ever sent from Mexico to Europe will be shipped next week from land adjoining the Monterey & Mexican Gulf Railroad, Mexico.

A piece of expeditious work is reported from New Jersey in the inauguration of the Newark and South Orange Railroad. After a bitterly contested litigation the company were, last Friday, granted a franchise for the erection of their trolley system by the South Orange Board of Trustees. Fearing an injunction might be obtained, they put 300 men to work on Friday night; poles were erected, wires strung, and electricity turned on at 10.40 a.m. on Saturday, the first car being run over the line in a little over 12 hours from the time the franchise was obtained.

Copper Coating the Hulls of Vessels By Means of Electricity.

Those familiar with the subject, and therefore well qualified to express judgment, have frequently and emphatically called attention to the necessity for sheathing the hulls of steel vessels with copper in order to obviate the troubles arising from marine growth, both animal and vegetable, on vessels not heathed with copper. It has been repeatedly pointed out that the cost of docking the vessels in the new navy will amount to many hundreds of thousands of dollars per annum, the cause for the docking being directly due to the fouling of the bottom. All the vessels should be docked twice a year and in some cases three and four times a year, depending upon the waters upon which they are afloat. Therefore any method which will obviate this difficulty should be received with favor. It is estimated by the officials of the Navy Department that the cost of docking, cleaning and painting the cruiser "Chicago" at suitable intervals during a three years' cruise will require the expenditure of nearly $100,000.

Theodore D. Wilson, late chief constructor of the United States Navy, in his report to the Secretary of the Navy writes as follows: "Thousands of dollars have been expended in the testing of protective and anti-fouling paints and compounds with results which give but very little encouragement to further experiments. We are forced to admit that despite the investigation of noted chemists and the deep study of other professional men there has not yet been discovered an efficient sustitute for copper sheathing."

The method of sheathing steel vessels with wood and afterward applying copper to the wood is extremely clumsy. In order to prevent galvanic action taking place, to the injury of the steel, it is essential to first attach a 2-inch wood sheathing to the steel by means of iron bolts, and on this place a second 2-inch sheathing attached by means of copper bolts, and this finally covered with copper sheets.

It is well known that marine growths take place no matter what the hull of the vessel may be covered with. The advantage of using copper lies in the fact that the growth, instead of being so firmly attached as to require mechanical means for its removal, as in the case of painted and plain hulls, is so weakly adherent that a slight motion of the vessel through the water, or even the ebb and flow of the tide, serves to remove it. Therefore, while a copper coated vessel may under certain conditions of inaction become slightly coated, as soon as the vessel moves through the water this growth falls away. The present Chief of the Bureau of Construction and Repairs in the United States Navy explains this in the following language, referring to copper: "That metal being easily corrodible in sea water, and the resulting verdigris having scarcely any adhesion to its metallic base, falls off with the least possible force, like the wash of the waves or the movement of the vessel through the water, and in falling off carries with it the marine accretions, leaving the metal continuously bright and clean. So continuous is the corrosion of the copper and the falling off of the verdigris that the spores of the marine fauna and flora have no time to develop, and the copper continues clean indefinitely. Experience has shown, however, that the loss of copper from this cause is only 30 per cent. of its thickness in 15 years.

Another vital condition, dependent on the keeping of the hull clean by sending the vessel to dock, is the decrease in speed and consequent increase in coal consumption due directly to the greater power required to drive a hull covered with marine growth through the water. Chief Constructor Philip Hichborn, U. S. Navy, in his report of April, 1889, estimates the resistance of an iron skin as twice that of a smooth copper bottom, increasing to nearly threefold when moderately foul, and to nearly nine times when barnacled, and barnacles and seaweed may collect upon the iron bottom to such an extent as to reduce the speed of the vessel to an almost imperceptible motion.

It is well known that United States vessels in waters far from docking facilities lose sometimes as much as 50 per cent. of their speed efficiency because their hulls cannot be properly cleaned.

Chief Constructor Wilson of the Navy Department, in his argument for copper sheathing, submitted a letter from Commander Philip of the "Ranger," dated June 22, 1892, in which he called attention to the fact that with a clean bottom the ship readily made 7 to 8 knots on 7 tons of coal, while with a foul bottom she only made 6 knots though burning from 12 to 14 tons of coal per day.

We illustrate in a general way a method of copper coating the hulls of steel vessels by means of electricity after patents issued to Thomas S. Crane, and which are controlled by the Ship Copper Plating Company of Newark, N. J. By this method copper is deposited electrically upon the surface of the vessel in successive sections, the joints of the sections being overlapped to unite them. The joints are united so perfectly by the electroplating process that the whole coating of the vessel becomes an unbroken metallic sheet. The plating is done by means of a bath like a rectangular box open at one side and fitted water tight to the skin of the ship.

Fig. 1 shows in side elevation the application of the tanks to be applied to the hull of a vessel; Fig. 2 shows the bath for copper coating the keel, and Fig. 3 a method of forming a water tight joint between the tank and vessel.

In these drawings A is the hull of the vessel, B the baths applied to the side, and N N^1 the electric conductors, C in Fig. 3 being a tubing which forms the water tight joint between the edges of the bath and the side of the ship.

Any form of elastic packing can be used to make the bath water tight where it touches the iron hull of the vessel. The frames of the bath are made flexible, and may thus be bent to suit the curved lines of the ship at various points, and special baths are constructed to embrace the keel, as shown in Fig. 2, and for complex ins faces like the stern bearing and rudder post. It is very evident that the construction here shown may be modified considerably without departing from the principles underlying the system.

Somewhat extended experiments have shown that the copper can be deposited so as to perfectly cover the hull, and that it will cling with such tenacity to the steel as to make its removal impossible without destroying it. Concerning the rate and cost of depositing copper of suitable thickness by this method, it has been calculated that any number of baths 4 x 10 feet may be operated simultaneously in 70 hours' time with an expenditure of 6½ horse-power for each bath. Upon a vessel 400 feet long 60 baths can be operated at once in three rows on one side, with 390 horse-power; or 120 baths, 60 on each side, can be operated at once with 780 horse power, at a cost per day of $150. It is stated that the whole bottom of a ship drawing 20 feet of water can be plated from the water line down complete in eight or nine days by using 60 baths at once on each side, with 780 horse-power, shifting the baths two or three times. The plated surface of such a vessel would aggregate 24,000 square feet and require 55,500 pounds of copper, which, at 12 cents a pound, would cost $6660.

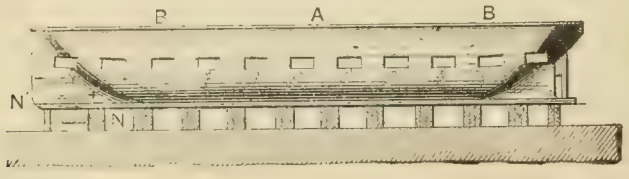


Fig. 1.—Side Elevation, Showing Tanks Applied to Hull.

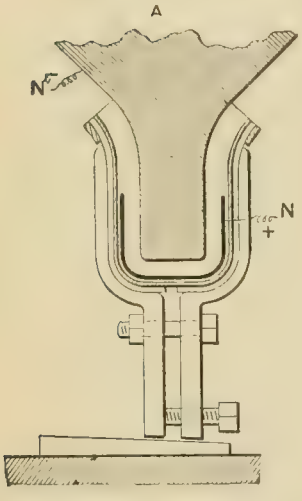


Fig. 2.—Bath for Copper Coating the Keel.

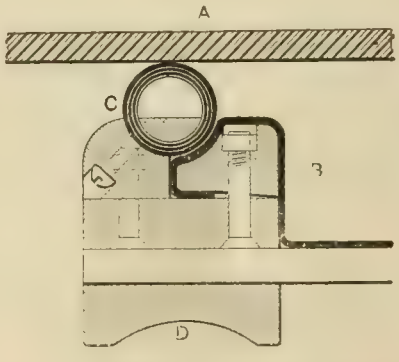
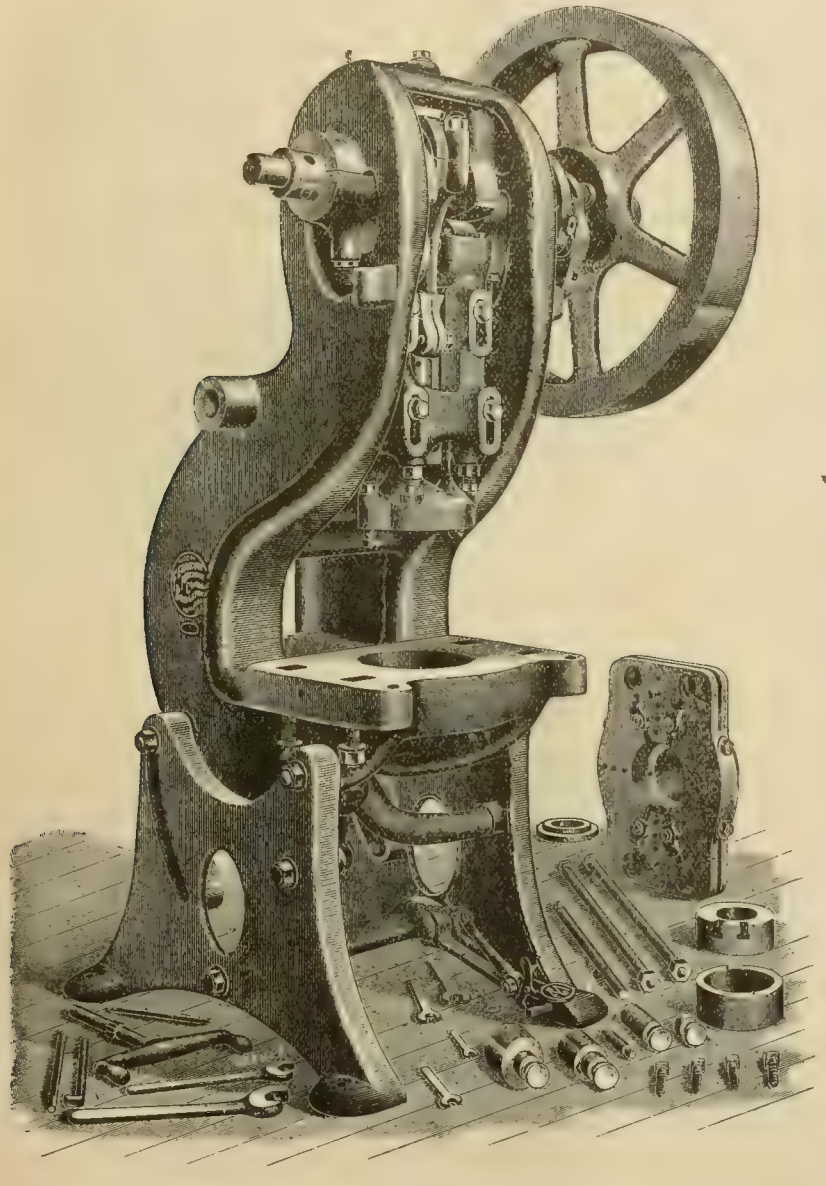


Fig. 3.—Section Showing Joint Between Edge of Tank and Hull.

COPPER COATING THE HULLS OF VESSELS BY MEANS OF ELECTRICITY.

Inclinable Drawing Press.

This Ferracute inclinable drawing press differs materially from the one by the same makers, the Ferracute Machine Company of Bridgton, N. J., from designs by Oberlin Smith, which was illustrated in *The Metal Worker* of September 30. This machine is built with a frame so mounted upon its legs as to be quickly inclinable to any desired angle by a convenient elevating screw, and proper clamping nuts for securing the same.



INCLINABLE DRAWING PRESS.

Its weight is 4700 pounds and its dimensions, &c., as follows: Round hole through bed, 10 inches; throat from ram center back to frame, 9 inches; hight bed to ram, with ram up, 12 inches; stroke of ram, 2½ inches; adjustment of ditto, 3 inches; hight bed to plunger, when up, 17 inches; stroke of plunger, 5 inches; adjustment of plunger, 3 inches; fly wheel, 42 x 6 inches; and weight of same, 1150 pounds; speed of fly wheel, 180 revolutions per minute; thickness of bolster, 3 inches; and round hole in same, 7¼ inches; pressure safely exerted by ram, 52 tons; maximum diameter of work, 7 inches; and depth, 2 inches; maximum blank diameter, 11 inches.

The spring ram lifter is arranged with an equalizing lever, so that the lifting is practically equal all the way up, together with a positive lifting device connected with pitman so that the cams cannot leave the rollers in case the spring lifter should fail.

The ram has a very large hole for deep punches to pass up into, and yet has solid metal to which the upper dies may be fastened by the hooked clamps provided, together with a plunger having a large and long hole for shanks of punches, with a locking arrangement which moves them positively up and down, but allows sufficient play so they may enter their dies accurately and centrally, while at the same time leaving room to put in bushings to fit various odd punches which may be required.

The bolster is provided with a deep and heavy truss extending down into the bed of the press so that it may remain perfectly flat and yet can be tipped slightly out of level at its different corners by four sliding wedges driven by screws and nuts, while at the same time its thin and elastic edges are firmly clamped to the bed of the press, thus enabling dies to be accurately aligned to each other to prevent wrinkling of work.

A pair of stay rods are furnished which can be quickly inserted in the frame, thus making the press nearly as stiff as a straight column press, upon certain occasions where great rigidity is required, and where it is not necessary to pass long sheets through sidewise, as is usually done in throated presses.

An automatic stop clutch and clutch plate carrying the tripping device are provided as in the press previously described. The four hardened wheel studs for driving in the hub of the fly wheel, and the self-acting locking pins, are of the same design as in the other press. Three smaller and two larger sizes of presses of this same design are also built.

Tests of Aluminum Cooking Utensils.

A correspondent of the London *Ironmonger* mentions some interesting experiments which have been made at the instance of the French military authorities in order to ascertain to what extent aluminum is serviceable for kitchen utensils and the like. The results, on the whole, are said to have been exceedingly satisfactory. The tests were made with plates 0.04 inch thick, with an area of 7 square inches, which were for some length of time exposed to the influences of various liquids. These comprised, besides the beverages generally used by the soldiers, various acids, and the experiments extended in some cases over a period of four months. The plates were carefully weighed and cleaned prior to the testing and again weighed after its cessation. Any deduction in weight indicated how much the plate had suffered. A plate weighing ⅛ ounce which had been inserted in claret containing 9½ per cent. alcohol for four months had lost 0.108 grain. The plate appeared none the worse, nor had the claret, which had been kept well corked, changed its taste. Beer and cider gave the same result, and the loss in weight by exposing aluminum to coffee, sugar and milk was entirely insignificant. Cotton oil had no effect whatever, and butter which was several times heated certainly darkened the metal somewhat, but there was no perceptible loss in weight, and the discoloring was easily removed. Soup of various kinds had no effect. Finally, the aluminum was exposed to the influence of the air and the earth; in the air there was no effect; having been placed underground in a damp garden for a couple of months a plate of ⅛ ounce had lost 0.062 grain.

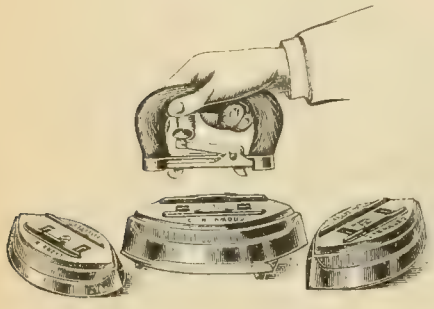
The results have proved that aluminum is very well adapted for kitchen utensils, &c. Air, water, wine, beer, coffee, milk, oil, butter, fat, earth, &c., have less effect upon it than upon iron, copper, lead, zinc and tin. Vinegar and salt attack aluminum a little, but not to such an extent as to affect its suitability.

Augustus R. Hall of the firm of Hall & Carpenter, tin plate and metal merchants of Philadelphia, died at his home in that city on Saturday, October 7. Mr. Hall at an early age entered the firm of N. & G. Taylor, taking control of the sales department. In 1867, in conjunction with the late Mr. Carpenter, he founded the well known firm which bore his name. On the death of Mr. Carpenter in 1883 Mr. Hall continued the firm as sole proprietor. He was an active member of the Masonic order, of the Board of Trade, Commercial and Maritime Exchanges, the Union League and the Historical Society of Pennsylvania.

THE RETAIL STORE.

Crown Sad Irons.

The cut herewith given represents improvements in Crown sad irons, as manufactured by Colebrookdale Iron Company, Pottstown, Pa., whose New York office is in charge of Duncan K. Major, 103 Reade street. The handle



Crown Sad Irons.

is made from selected apple wood, worked out by machinery, and neatly finished. The handle is adjusted by raising the knob with the finger, while its shape is such as to adapt it nicely to the hand. The point is made that the construction of the handle obviates any looseness and rattle. The irons are plain polished and nickel plated, finished in gilt, and are packed three irons, one handle and a stand to a set.

Sporting Goods in the Hardware Store.

BY R. T. PALMER.

The profits from the sale of sporting goods has led wide awake Hardwaremen to pay greater attention to these lines, and the number who have laid them in during the past few years has greatly increased. There are many places, however, where these goods are not kept in sufficient variety and quantity to do these lines justice. One great aid in purchasing goods suitable to the local trade, and in disposing of them, is the sport-loving proclivity of the merchant himself. From his own indulgence in hunting and fishing he will better understand his brother sportsmen's wants, and it will teach him to avoid burdening himself with unsalable and inferior articles, which in time accumulate into worse than useless stock.

He will be alive to the merits of novelties which are constantly coming on to the market and by providing them will convey to his customers the idea that he is headquarters in his line.

Another most important aid is an early and

SEASONABLE DISPLAY,

not a heterogeneous mingling of all sorts of Hardware with sporting goods —but a window tastefully decorated containing a solid display of Tackle in the early spring just before the opening of the season, with perhaps a display of the same a few weeks later, and an exhibit of Guns and Gun goods in and during the fall.

SOLID DISPLAYS

always attract and hold attention, and no windows are more interesting to man and boy alike than those containing paraphernalia which bring up to the memory instances of boy life.

PRIZES.

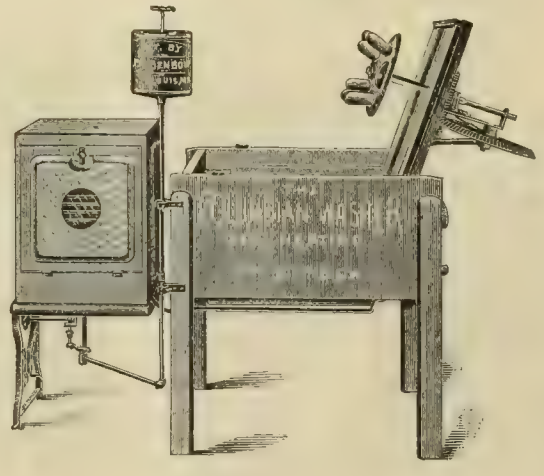
In many instances to stimulate fishermen's enthusiasm and rivalry dealers have with much success offered prizes for the largest bass and trout caught during the season, same to be weighed in the dealer's store, while the first bird of the season has become traditional. In smaller cities lawn tennis can be laid in to advantage, more especially so if the dealer associates with those among whom the game is popular. These goods are ordinarily handled with baseball goods by the book stores, and it may often be wiser not to intrude.

BICYCLES

are essentially a part of the Hardwaremen's stock and are deservedly receiving more attention from the trade. While in the Tackle and Gun lines it is necessary to carry in stock cheap-priced articles for a class of trade who cannot be induced to buy higher grade goods, yet it is always policy to sell a man as good an article as he can be persuaded to buy, even at a less ratio of profit, as a well-suited customer is always a good advertisement, and in nothing, perhaps, as much as in sporting goods. It is good policy in any branch of merchandising to exhibit interest in your customer, but particularly so in the success of your customer with his Rod and Gun.

The Columbian Washer.

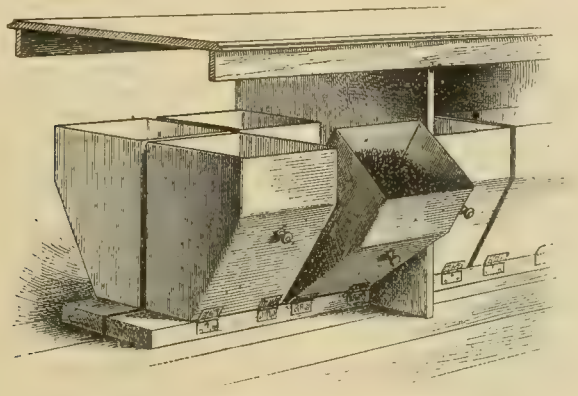
The Columbian Washer, as shown herewith, is being introduced by P. T. Benbow, 1814–1816 North Eighteenth street, St. Louis, Mo. The pin wheel is malleable galvanized iron, with a galvanized shaft turned out of wrought iron. The shaft, it is remarked, regulates the pin wheel to the amount of clothes in the washer, by playing up and down through the small gear wheel above the lid, so that there is no shaft below the pin wheel to entangle the clothes, causing the machine to work hard. It is stated that the pin wheel will not wear out, as hot water cannot affect it; and that the bearing through the small iron gear that the shaft plays through is 2 inches long, so made as not to wear out. The holes in the pin wheel are made flaring, so that the pins are firmly wedged to prevent them coming out even when they get dry. The bottom of the washer is of galvanized iron, put on with white lead and packing. There is also a corrugated false bottom, which is raised from the main bottom, leaving a space for dirt from the clothes to settle in, instead of being ground into the clothes; admitting of the suds being used longer. The false bottom lifts out so the machine may be cleaned. Heavy three-cornered blocks are fastened in each corner of the washer, underlaid with white lead to strengthen the box; and corrugated strips are used on the sides of the washer, placed a little apart, so as to prevent them from bulging and splitting when wet. The gasoline burner swings under the washer, where there is a flame protector, to keep the flame from being blown out. The water is heated in the washer, and the burner may be swung under the stove for making starch, heating sad irons, or for cooking and baking. The washer is sold with the gasoline stove attachment.



The Columbian Washer.

Tipping Nail Bins.

We are indebted to Charles M. Norton of Lansing, Mich., for the design of Nail Bins shown in the cut—bins similar to which he has had in use for some time. He does not claim to be the originator, as the design was borrowed from Newman & Kennedy of Portland, Mich. Each bin is 14 inches high, straight at the back. In front the straight part is 3 inches high, and the slanting part 11 inches high. Each of the four sides measure 16 inches at the top, while the base is 6 to 8 inches wide and 16 inches long. The bins stand on a plank 2 inches thick, to which they are hinged



Tipping Nail Bins.

to tip forward. A base knob is attached to the front of the bin, so that where the bin is tipped forward it is held up from the floor, thus permitting the scoop to go under the front edge when taking out Nails. Two rows of bins were placed under a counter back to back, one row holding Cut and the other Wire Nails. This construction of bins has been found to work very satisfactorily.

A Merchants' Local Association.

BY F. H. WOODWORTH.

In recent years there has been a marked tendency on the part of manufacturers to effect associations, combinations, trusts, &c., and in most instances their efforts have been quite successful. Why, then, should not merchants follow in the same line? The time has come in this country where the keen blade of competition cuts such a wide swath that merchants of small or moderate means are almost handicapped by being thrown into competition with large concerns.

The tendency generally on the part of

LARGE HOUSES

is constantly to cut prices rather than to hold them up on a profitable basis. They are jealous of their smaller competitors and frequently would rather give the customer the benefit of their profit than to allow the competitor to make a sale. A great deal of rivalry exists and this rivalry tends to lower prices and demoralize trade.

THERE IS A REMEDY

which, when properly administered, will effect a complete cure, especially among the Hardware merchants—viz., local associations of dealers. I have been a firm believer in this policy for several years, and have endeavored on various occasions to convince my competitors that we would all be very much benefited by an organization of this kind. Finally, after considerable effort, the Hardware merchants of our city (consisting of seven houses) had a meeting one night in March, 1893, and effected a permanent organization, and I am glad that I can speak from experience at this writing.

OUR ASSCCIATION

here has been in existence now for the past six months, and the older it grows the more each member is pleased with it. We all feel benefited, and instead of looking upon one another as competitors we regard each other as friends. We meet regularly every Monday night for the transaction of any business that may be brought before the association. These regular meetings tend to keep up an interest in the association, and, for my part, it is one of the most pleasant evenings I spend during each week. Prices have been regulated and placed on a profitable basis, cut throat business has ceased and petty jealousies have entirely disappeared. We have

CONFIDENCE

in each other instead of distrust, and although business has been very much depressed during the past few months, we have the satisfaction of knowing that we are making a living profit on what goods we sell. Again, I must say that I heartily favor the local association of Hardware merchants, and feel confident that Hardware merchants all over the country would be much benefited by such organizations when properly conducted.

Automatic Steam Coffee Cooker.

Wilmot Castle & Co., Rochester, N. Y., manufacture a coffee pot on the same principle that is embodied in their Arnold automatic steam cooker. Fig.

Automatic Steam Coffee Cooker.—Fig. 1. —General View of Coffee Pot.

1 of the accompanying cuts shows a general view of the pot, while Fig. 2 shows a sectional view through the pot and the steam cooking attachment. It is pointed out that coffee cooked with steam at an unvarying temperature of 210° cannot boil, and it is therefore much better and more wholesome. The steam generated in the tin vessel under

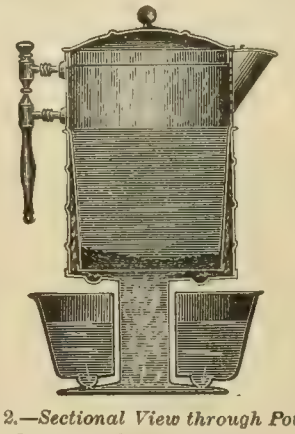
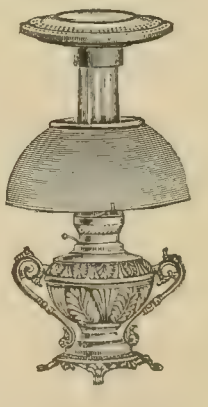


Fig. 2.—Sectional View through Pot and Steam Cooking Attachment.

the pan rises around the coffee pot and drips back into the reservoir. Extra pots are used for tea, which, the manufacturers claim, should be prepared in the same manner. Urns for boarding houses and small hotels are also made on the same plan.

The Merrill Heater.

Among the lamp stoves which are at present on the market that recently



The Merrill Heater.

brought out by Randall & Becton of 19 India street, Boston, Mass., is worthy of more than passing notice. It is known as the Merrill and is illustrated in general view in the accompanying

cut. From an inspection of the engraving it will be seen that, generally speaking, the device consists of an ordinary fountain lamp, on the top of the chimney of which is supported a shallow drum formed of two dished disks, joined at their outer edges and presenting the appearance shown. The top disk is perforated near its outer edge with nearly 300 small openings for the discharge of the heated air. The material employed is aluminum, which does not tarnish with use and which greatly resembles silver in its appearance. The lower disk is made of nickel plated brass with an opening for the introduction of the chimney top and is corrugated so as to allow for expansion and contraction. The drum is suspended upon the chimney top by means of hooks, which can be adjusted to suit varying sizes. A nickel plated collar loosely incloses the top of the chimney and permits the entrance of cool air into the drum, thus increasing the circulation. The manufacturers state that the device will not break chimneys nor cause soot or smell. They also claim that by the use of the Merrill heater the current of air is retarded in its upward progress, superheated and discharged in tiny streams into the surrounding atmosphere. The principal object of the construction employed is claimed to be the warming of the greatest volume of air in the shortest possible time.

Brad Brackett.

Brad Brackett kept a wholesale store
Under the Spring hoe-tel;
And though his ware was in demand
It was hard ware to sell.

His stock of staple goods was on
A scale you seldom find;
Including pokers, shovels, tongs,
Andirons of that kind.

Although a skillful financier,
He would not gouge in trade;
Nor chisel any one a bit,
If ne'er a cent he made.

A plane and quiet man, he ne'er
Was known to stirrup strife;
A firmer friend one never saw
En-gauge in business life.

Possessed of hinge-enuity,
That compasses one's ends,
He did his business on the square.
And had a host of friends.

'Twas not by any ax-ident
He rose above the rest;
The key to his success was that
He did his level best.

Nobody had a stronger faith
In printers' ink than Brad's;
He used to say he carved his way
To fortune with his adz.

He always paddled his own can-oe,
And, pulley as he might
Against the stream or with the stream,
Was sure to come out right.

Of being a strong partisan
He had the reputation;
But, rather than support bad men,
He'd bolt a nomination.

As a tack-tician he excelled—
In auger-nizing led—
Though screw-pulous, was sure to hit
The nail upon the head.

He deprecated rings and frauds,
And scorned a party tool;
In politics, religion, trade,
He observed the golden rule.

He was no misanthrope, but took
A file-anthro-pick view
Of life, with its vice-cissitudes,
As all of us should do.

A splendid "catch," he lived a bach,
Anvil-age belles were told,
They tried in vain his heart to gain
With beauty or with gold.

Though a teetotaler, he kept
The best of bars, 'tis true,
Where one could get his "nippers" and
All kinds of punches, too.

But fickle fortune chain-ged at last,
And caster threatening pall
O'er him, and with one fatal wrench
Deprived him of his awl.

His locks by sorrow's weight were turned
To silver, and were long;
He fell before the scythe of Time
To join Death's mighty throng.
—*Detroit Free Press.*

The Cream City Flour Bin and Sifter.

Geuder & Paeschke Mfg. Company, Milwaukee, Wis., are offering a flour bin and sifter, as herewith shown. The bins are made of tin on improved machinery especially built for their production, handsomely ornamented to make them attractive as well as useful,

The Cream City Flour Bin and Sifter.

and each is packed in a separate package, strong enough, it is stated, to insure safe delivery at any distance from the factory. Notable among the features of the bin is a detachable shield, designed to protect the sifter from pressure by the weight of the flour, but to allow a sufficient quantity to pass through to insure quick and easy sifting, at the same time to obviate all grinding through of foreign substances. The bins are recommended by the makers as of more than ordinary merit, the sale of which will be found satisfactory and profitable.

Self Cleaning Filter.

Henry S. Smith, Chadwick, Ill., is offering a self cleaning filter for cisterns, which obviates the use of charcoal and gravel. The filter consists of a rectangular tin box, within which is a cut off, and three wire screens one above the other, the top one coarse, the next one finer and the lower one finer still. At one side of the filter is a conductor pipe, open on the side next the filter, and so arranged that the water can be turned, by the use of the cut off, into the conductor, or caused to pass through the screens into a separate outlet to the cistern. The screens slope somewhat toward the conductor at the side of the filter, to allow the accumulated filth to wash off and be carried to the ground. The cap covering the filter and conductor can be slid up to allow the screens to be removed. On the top of the cap is a collar corresponding in size with the down spout to which the filter is to be connected.

TWO OF THE HARDWARE DEALERS at Fort Edward, N. Y., offered stoves as prizes at the county fair for those who guessed nearest the correct weight. Mr. Bowtell offered a Gold Coin range, which was drawn by John Bickley of Glens Falls, and Newton & Hill offered a Princess Acorn at the Washington County Fair, which was drawn by Mrs. Margaret Durkee of Fort Edward.

Gersdorff's Improved Standard Funnel.

J. Hall Rohrman & Co., Philadelphia, Pa., are putting on the market Gersdorff's Standard funnel in an improved form. The improvement consists in the overflow ring, which is now spun on to the top of the funnel, instead of being soldered on, as in the old style. The funnel is made of three pieces of sheet copper or tin, seamed from the top to the center, and soldered from the center to the nozzle, with an overflow ring at the top. The nozzle is shaped triangularly, so that when in use the funnel rests firmly in the neck of a receptacle and makes three perfect vents for the escape of air during the process of filling. The funnel has a strainer so arranged as to be readily removed when required. The makers claim that they can now produce it at a price not exceeding that of an ordinary first-class funnel.

P. J. Davy, agent for the Magee furnace at Niagara Falls, N. Y., is placing one in the residence of Patrick Mocklar of that city.

Two Notable Canals in Europe.

The canal across the classic Isthmus of Corinth, in Greece, which was commenced on March 27, 1882, is now approaching completion. It is announced that it will be formally opened on April 23. The work is a little over 3½ miles long, 68 feet wide on the bottom, 80 feet wide at the water line and 26 feet deep. It will connect the Gulfs of Athens and Corinth and greatly shorten the voyage from Adriatic ports to those in the Levant and Eastern Mediterranean. The original calculation for the work put the excavation at about 14,000,000 cubic yards, and the first capital was $6,000,000, to which $2,800,000 more had been added by July, 1889, when the works came to a standstill on account of lack of funds. A new company was then formed to finish the canal, with a capital of $1,000,000 in shares and $4,666,700 in obligations, of which about four-fifths have been issued. This company have so far completed the work that the opening is announced as above. Meanwhile an even more important work is going on in Northern Europe in the ship canal between the North Sea and the Baltic, which, we are told, is being pushed on with such energy and regularity as to give good hope of its being finished in 1895, as originally intended. One hundred and seventy-three million cubic feet of excavations have already been made, and some of the locks are nearly finished, while the banks are being lined at several points. On account of the increasing size of vessels the width is now to be 218 instead of 200 feet, and the depth 30 instead of 27 feet, while the number of pass-bys is being increased so as to facilitate the navigation, these improvements necessitating a large increase in the estimated quantity of excavation. The terminal locks at Kiel and on the Elbe are to be made double, and both of them provided with two entrances.

STOVE TRADE NOTES.

Future of the Hot Air Furnace.

By A. W. Glessner,

President of the Excelsior Steel Furnace Company.

THE FURNACE TRADE FOR 1894.

An enterprising furnace dealer from an Iowa town called on me recently, and, in discussing the outlook, stated that, while he expected a fairly good fall trade, he did not anticipate selling a single furnace in the year 1894. Being asked for an explanation of this very pessimistic view, he said that, in his opinion, the financial stringency would lead to a total cessation in the line of building throughout the country, and that, with no new buildings going up, there would, of course, be no furnaces sold during the coming year. He was then asked how many furnaces he had placed during 1892, and replied that he had sold nearly 40 ; and on analyzing the sales of that year, it was found that over 30 were placed in new buildings and nearly 10 in old houses, churches, stores, &c., or nearly 25 per cent. of the total sales were for buildings erected in previous years, and for which no provision for heating, other than by stoves, had been made.

These facts gave me an opportunity for an argument with my furnace friend, which I embraced, and I called his attention to the possibility of making the year 1894 the banner one in the history of his furnace business. In almost all growing towns and cities improved heating apparatus is installed, as a rule, in the new buildings which are erected, and dealers devote their spare time to looking up and canvassing this trade, as each new building yields to the dealer a good business in building paper, nails, spouting, roofing materials, paints, builders' hardware, heating apparatus, &c., and the trade in the way of furnaces that he gets from the owners of old buildings comes to him unsolicited. In each Western town there are doubtless at the present time a very large majority of the houses of the better class unprovided with improved heating apparatus, and here is a field for the enterprising furnace dealer to develop in 1894 if the construction of new buildings is to cease. Each winter sends to the junkman a goodly number of parlor stoves which have outlived their usefulness, and the past winter being one of unusual severity, it is fair to suppose that the number of stoves ready for the scrap heap this spring was greatly augmented, but the wave of economy which is spreading over the land will lead to the repairing of these crippled parlor heaters, and they will be made to do duty for one more winter, but in 1894 they will be consigned to their fate.

At this juncture the furnace dealer should step in and demonstrate to the house owner the economy of replacing the worn out stove with a hot air furnace, and he will have no difficulty in so doing if he simply cites the facts with which he is already familiar as to the comparative merits of the two methods of heating.

I would suggest further that each dealer compile a list of the house owners of his city or town who are not provided with furnaces and devote his spare time to a careful canvass of such owners, bringing the merits and economy of the hot air furnace to their attention, and do so systematically and persistently, and sales will undoubtedly result.

Even if times are hard and money tight people will not do without heat, and it can be seen that the furnace dealer is in a good line for a close year, as his wares are a necessity, and if he presents them as such he need not fear the result.

In many towns there are public halls, schoolhouses, stores and churches which in ordinary times would possibly be heated by steam or hot water, but owing to the scarcity of money these contracts can be turned to hot air heating and afford considerable work to the dealer.

Furthermore, if there is a cessation of building throughout the country the furnace dealer will have his capital formerly invested in carrying a large stock of builders' hardware and materials unemployed, and if he chooses he can offer to the class of wage worker who is perhaps the owner of a modest house a furnace on the installment plan, so much in vogue in other lines, and thus stimulate a trade that will yield a good margin and be a reasonably safe business risk.

The low prices now ruling in this line of trade will probably continue and the tendency in prices is constantly downward, so that the market in '94 will be in the buyer's and dealer's favor as against the manufacturer, and this in itself should stimulate the demand for furnaces in 1894, and if the dealer will work his territory carefully he will have no occasion to be displeased with his sales during the coming year. Times may be close and theater tickets and party dresses very scarce, but the country will be here and the people will keep comfortable and economize if they must in the luxuries of life and not in the necessities.

(To be continued.)

Rat Tail.

BY DR. EDWARD KIRK.

When visiting stove foundries I am frequently asked to give a reason for, and a remedy to prevent, the formation of the small scar on the surface of plate known as rat tail through the New England States and by various other names in other sections of the country. Rat tail is a small scar from $\frac{1}{8}$ to 2 inches in length and from $\frac{1}{16}$ to $\frac{1}{4}$ inch wide at the widest part, and tapering off to a small point. It is generally found on covers near the outer edge and on taps near the collar, but may be found on other castings.

This scar is formed when molten iron is poured into a mold for light plate, and is forced between the two surfaces of the mold by the pressure of iron in the gate. When the iron enters a mold it does not flow evenly from the gate, but streams shoot off in different directions until they reach the extremity of the mold. Each stream or branch from the gate is then spread out by the pressure in the gate until the edges come together and the mold is filled. If the rounded edges of the streams are too cold when they come together they do not unite, and the result is a cold shot in the casting. If the iron is hot enough for the edges to unite, but is a thick, non-fluid iron, then the rounded edges on the surface of the mold that have become more chilled than the center do not unite fully and the result is a scar, which is the widest and deepest at the greatest distance from the gate where the iron is chilled to the greatest extent.

The same phenomenon is seen in plate poured with two or more ladles where the streams from different ladles are too cold when they come together. The remedy for this scar is to use a more fluid iron or place a larger gate upon the casting and fill the mold more rapidly. Scars are frequently formed on the surface of plate by the blacking, washing or rolling up before the iron until the drifferent streams come together in the mold, where it is held in one place and leaves a scar upon the surface of the plate where the iron forms over it in filling the mold. This scar is generally flat, wide and smooth, and when narrow the edges are rough and show the marks of the blacking. This scar is often due to carelessness of the molder in putting the blacking on the mold too thick, and also to the use of poor blacking. To prevent its formation put the blacking on light and use a good quality of blacking.

ODD PLATES.

J. H. Beach, one of the founders of the Bridge & Beach Mfg. Company of St. Louis, Mo., died September 21 at his home in New York City. In the year 1849 he entered the employ of the late H. E. Bridge as a clerk, and eight years later he was taken in as a partner, the firm name being changed from Bridge & Brother to that of Bridge, Beach & Co. Afterward the concern was incorporated as the Bridge & Beach Mfg. Company, the success of which is well known to the stove trade of the country. At the time of his death Mr. Beach was in the sixty-fifth year of his age.

The Michigan Stove Company favor us with a copy of the gorgeous picture of their World's Fair exhibit which they are now sending their customers. The special feature of this exhibit is the mammoth Garland cooking stove, whose hight is 25 feet, length 30 feet, and width 20 feet. Its weight is 20 tons, and it filled three cars. This great stove is in every respect, except as to size, an exact representation of one of the company's standard stoves. Supported on four pedestals, one under each foot, it forms a cover or pavilion for the company's general exhibit of fine stoves and ranges. The total size of this exhibit is 30 x 40 feet, and it is valued at $25,000. It is by common consent one of the unique features of

the great exposition. The chief of the Department of Manufactures characterized it as the most typical of all the exhibits in the great Manufactures Building, the largest building in the world. A painting of the exhibit was made by Will H. Crane, the celebrated artist, and from it were copied the pictures which are now being distributed. These pictures reproduce the colors of the original faithfully. They are so artistic as to merit the suggestion made by the company that they be framed and placed in show windows of stores. We have also received from the same company samples of transparent signs to be affixed to the glass tops of showcases, warning loungers, "Don't lean on the glass," and tastefully designed match scratchers for wall use.

The Comstock Castle Stove Company of Quincy, Ill., issued under date of September 30 a stock sheet for the month of October, 1893. The object of this sheet is to call the attention of dealers to the kind and sizes of stoves which the company can promptly ship on receipt of orders. The company state that although "a very large proportion of manufacturers of stoves closed their works during the late monetary stringency, thereby causing a very short supply," the company have by special effort kept their foundries running full so that they now have a large and well assorted stock, as indicated by the list which they publish.

The Griswold Mfg. Company of Erie, Pa., have issued under recent date a circular letter addressed to their friends in the trade. Reference is made to the marked increase of orders with which the company have been favored during the past few weeks, indicating that business is reviving and that the future is likely to show a good volume of trade. The company state that they are prepared to promptly fill orders, and suggest to customers that they indicate at once their requirements. In addition to their regular line of hollow ware and American dampers, the company call special attention to their assortment of model or toy ware for the holiday trade. They refer to the new American waffle iron with improved hinge and handle, and to their line of post boxes, cuspidors, letter presses, tobacco cutters with name plates, French waffle irons, as well as to the great variety in style and finish of their lid lifters, pokers, stove scrapers, &c.

Among the minor souvenirs distributed in Chicago is a little circular card by the makers of Buck's stoves and ranges, in representation of a monocle, or, rather, the eye without the glass. The legend on the back relates to Buck's stoves and ranges.

We have received from Secretary D. M. Thomas a copy of the report of the proceedings of the twenty-second annual meeting held by the National Association of Stove Manufacturers of the United States, at Chicago, May 31 and June 1 of the present year. The report of this meeting makes a volume of 228 pages and contains much that is of interest and value to the trade at large. The arrangement of the matter is similar to that which has been followed in previous reports, the only noticeable change being the interpolation of pages of advertising in the early part of the volume. Another feature is a buyer's guide, consisting of a list of names of concerns dealing in goods employed in the manufacture of stoves. The report concludes with an index of the advertisers and a copy of the constitution and by-laws of the National Association. The interleaving with colored advertisements may be commendable from a financial point of view, but hardly from any other point of view.

J. H. Moses, an enterprising stove dealer at Croton Falls, N. Y., is at present visiting the Metropolis for the purpose of making his usual fall purchases. During his sojourn he will be the guest of George H. Butcher of Southard, Robertson & Co.

"Compliments of Peninsular Stove Company, Detroit, Chicago, Buffalo," is the inscription in raised letters upon the back of a nickel plated easel which the company named are distributing to those visiting their exhibit at the World's Columbian Exposition in Chicago. The little easel stands 5½ inches in hight and has an average width of about 2½ inches. The central portion is embellished with a sunken panel carrying, in relief, a representation of a stork standing amid rushes and cat tails. The raised surfaces of the easel are nickel plated and finished with a high polish.

Mosher's Lilliputian hot air furnace is the subject of a four page circular which reaches us from M. J. & M. R. Mosher of West Troy, N. Y. This device is referred to as a new and powerful furnace, lilliputian in size, but a giant in heating capacity. It is said to be simple in construction, having no joints except packed ones between the fire pot and dome, no bolts and no flues to fill up. The fire pot and dome are made extra heavy. In connection with this heater the manufacturers call attention to the fact that they have made laundry stoves since 1880 and have shipped them to all parts of the world.

The Milwaukee Gas Stove Company, 15 and 17 Erie street, Milwaukee, Wis., send us a miniature copy of their catalogue of Perfection gas grates. The little volume measures 2½ x 3¾ inches, and opens the long way of the book. The engravings are clear cut, and the text, although small, is yet readily readable.

Foster Brothers, proprietors of the Central Stove Works, at Lebanon, Pa., tested their new plant on October 5, with great success. We understand that their expectations were fully realized with regard to the melting apparatus and to the machinery with which the works are equipped. The plant has been constructed with due regard to the requirements of their business, and the company are now fully prepared to receive orders for stoves constructed after the latest improved patterns, using the best materials and employing skilled mechanics.

A. Weiskittel & Son, Baltimore, Md., have issued a pretty little catalogue descriptive of the Fire King gas heating stoves and ranges. It is made up of about 50 pages of letterpress, profusely illustrated, and bound in paper covers with attractive side title. The Fire King gas heating stoves are shown in several varieties and are made in such a way as to take the cold air from the floor and discharge it in a highly heated condition through openings in the top of the drum. Under the name Fire King the company offer a line of stoves somewhat resembling open Franklins in their general appearance and ornamented with brass plated fender and corrugated copper reflector. The other goods have asbestos flame plate and copper sides and bottom with a sheet iron upper section. A line of hot plates are provided with the company's new loose top burner, the top of the stoves being loose so that they may be removed for cleaning. This line of goods, we understand, is a new departure on the part of the company, the tops being extra wide and perfectly flush so that combination cookers or extra wide pots or pans can be set on without danger of tipping over. Fire King ovens, sad iron heaters, tubing for gas stoves, independent connections and other matters likely to prove of interest in connection with gas burning appliances occupy several pages of the pamphlet. The Fire King gas ranges with water heaters attached are illustrated and described, while a long list of testimonials show the favor with which the Fire King gas stoves and ranges have been received at the hands of those practically demonstrating their merits.

A neatly finished Maltese cross in bright red material, which might be mistaken for coral, is the souvenir of the Columbian Exposition that is distributed in the interest of the Red Cross stoves and ranges. The Co-operative Foundry Company of Rochester, N. Y., have given such wide renown to the Cross of Malta that a sight of this emblem is sure to bring to mind a certain line of stoves and ranges, where it formerly was only suggestive of an ancient order of knighthood.

The Joseph Bell Stove & Range Company of Muncie, Ind., recently shipped a stove which is destined for a long journey. It was purchased by Rev. T. A. Holliday, formerly of Cadiz, Ohio, and now a missionary in Northern India. The cook stove will cross the ocean on the steamer "Arizona," sailing on October 14. Upon reaching the other side it will journey something like 1700 miles further before its destination is reached.

Some of the people who reside in the natural gas districts do not seem to take kindly to the use of natural gas as a fuel for cooking purposes, if we may judge from a short article contained in a late issue of the *News*, published at Toledo, Ohio. This paper states that the hardware dealers in that place have noticed this fall that in the sale of stoves about 90 per cent. of the purchasers have taken coal burners. Several oil stoves have been sold, but the demand for those burning natural gas seems to be limited. The article in question continues: Of the old stoves thrown out or exchanged with the dealer the great majority are gas burners. There are very few coal burners being returned, and those which are taken in exchange are replaced by new coal burners. The hardware dealers say that they never had such a heavy business in the sale of stoves, especially heaters, as they are having at present. Everybody in the city appears to want stoves at the same time. The purchasers of stoves inform the dealers when they come to make a purchase that they will stand no more freezing or fooling with natural gas this winter. They claim that last winter's experience was enough for them.

At a recent meeting of the Vapor Stove Manufacturers' Association of the United States, held in Cleveland, Ohio, it was decided, owing to the numerous accidents which have occurred on account of a stationary tank on Junior stoves, that hereafter all Junior stoves turned out by the Manufacturers' Association shall be fitted with the lay down tank. The claim is made that the use

of this device makes it impossible to fill the reservoir while the burners are lighted. The manufacturers decided that there should be no extra charge for this attachment.

THE PLANT at Florence, Mass., of the Central Oilgas Stove Company recently began running full time in all departments, and the company, we understand, are shipping a large number of stoves.

JOHN P. BARSTOW, one of the best known and most respected business men of Norwich, Conn., died at his home on Huntington place, Tuesday afternoon, October 3. He was born in Augusta, Maine, the latter part of November, 1822, remaining in his native place until 1844, when he went to Canterbury, Conn., and entered the employ of his uncle Isaac Backus, who was engaged in the business of making cast iron stoves. In 1846 they moved to Norwich, the firm becoming Backus & Barstow. At the end of a few years Mr. Backus' health began to fail and he retired from the firm, his interest being purchased by Col. Edwin Palmer, then a resident of Preston. For a dozen years the firm name was Backus & Palmer, but ill health caused Mr. Palmer to sell his interest to the senior member of the firm, who continued alone until 1876, when Frank H. Smith and George S. Byles were taken into partnership, the style of the firm being J. P. Barstow & Co. In point of active service Mr. Barstow was the second oldest business man on Water street. In the years 1880 and 1881 he represented Norwich in the Legislature and at one time was a member of the Court of Common Council. He was one of the founders of the Storrs Agricultural College, a trustee of the Middletown Industrial College, a life member of the New London County Agricultural Society and director of the Chelsea Savings Bank.

THE BRAND STOVE COMPANY of Milwaukee, Wis., have issued a circular letter calling attention to the fact that they have a complete stock of goods on hand, and are in a position to fill all orders with which they may be intrusted. They express the hope that the financial disturbances which seriously affected the early fall trade and which made many of their customers hesitate to place large orders have come to an end. In view of the fact that the company's corps of traveling salesmen cannot this season cover their entire territories, customers are strongly recommended to mail their orders early. The wisdom of such a course, the circular states, will be apparent when it is remembered that if the present inflow of orders is maintained the excellent shape the company are in to do customers justice cannot endure, notwithstanding great exertions on their part.

W. JACKSON'S SONS, 246 Front street, New York, manufacturers of grates, fire places, &c., have prepared for the season's trade a number of new designs in fire place trimmings, including andirons, fenders, frames, grates and other fire place appurtenances. They have been arranged to suit almost any taste, and they cover a wide range in price from the primitive and inexpensive to the more pretentious and elaborate, where buyers are disposed to pay well for handsome goods.

W. H. LANDERS of the Syracuse Stove Works, Syracuse, N. Y., who was in New York during the week, is not complaining of the amount of business done by his firm. Through the early months, in fact, sales were much larger than a year ago, and even taking into account the relative dullness of the last two months, he is not anticipating a bad showing for the whole year.

WE ARE IN RECEIPT of a copy of a special edition of the Belleville *Illustrated Daily News-Democrat* of Belleville, Ill., which contains references to the stove foundries located in that city, as follows: "The Belleville Stove Works manufacture a full line of cook stoves and ranges in all styles and sizes. The trade-marks 'St. Clair' and 'Belleville' are everywhere regarded as synonyms of high grade and absolute perfection. The Snyder & Baker Stove Works employ 60 hands regularly and have a manufacturing capacity of 500 stoves weekly. They enjoy excellent shipping facilities, and their trade extends throughout the entire South and West. This company's success attests their merits and the esteem in which they are held at home and abroad. The Eagle Foundry is another of Belleville's important iron industries. It had its inception in 1882, and since that time has built up a large and increasing trade. The products of this foundry are the Star cannon, St. Louis box and O. K. stoves, which they sell largely in Illinois, Missouri, Nebraska and Kansas, the goods being particularly adapted to these sections."

THE QUICK MEAL STOVE COMPANY, St. Louis, Mo., are issuing to the trade their 1893 "pie" or diagram showing the number of stoves sold during the present year, which aggregate 71,316, or a total of 295,004 stoves sold since the business was started in 1882. During the present year they have sold 81 stoves to every one stove sold during 1882, and had their sales amounted to 1168 more during the present year they would have just doubled their business of 1891. When the conditions which have prevailed during the past six months are taken into consideration the record they have made for 1893 is certainly an enviable one and reflects much credit on the house and its management.

A FEATURE of the window display of the Barstow Stove Company, at the corner of Beekman and Water streets, New York, is a fine bas-relief casting of the "Beloved Disciple."

THE EXCELSIOR HARDWARE COMPANY, 58 Warren street, New York, have recently arranged for the sale of their imported English wall fires and gas grates at Philadelphia with E. J. Mahood & Co. and at Baltimore with A. W. Martin.

THE FULLER & WARREN COMPANY of Troy, N. Y., are represented at the Pure Food Exhibition in the Cyclorama Building, Baltimore, Md., by A. B. Morton & Sons, the enterprising stove jobbers of that city, who show the company's Splendid parlor fire place heaters. We understand that the manufacturers are meeting with a very gratifying demand for this line of goods from dealers in the Middle and Southern States.

"READ ME FIRST, and if I cannot help you throw me away" is the striking request made at the top of a folder which is a sample leaf from the "Furnace Estimate Book," published by Daniel P. Holmes, Norwich, N. Y. The book, as noticed some time ago in *The Metal Worker*, has two blank pages for drawings of special fittings or floor plans of houses or memoranda, and two pages enumerating all the different fittings to prevent anything being overlooked in estimating. It is convenient in size and having a record of prices quoted and jobs done, with the goods used, is a valuable possession, particularly in the off season when prices of such work have been forgotten.

HEATING NOTES.

UNDER DATE of October 1, Samuel I. Pope & Co., 360-364 Dearborn street, Chicago, Ill., announce that they have been incorporated under the name of Samuel I. Pope Company, with a capital stock of $60,000, fully paid. The corporation will be under the general management of Samuel I. Pope, the mechanical department under the charge of W. A. Pope, superintendent, and Henry F. Smith, heating engineer. The financial department will be in the care of Charles H. Patton.

THE REX HEATING COMPANY of Norwich, Conn., send out neat circulars relating to the Rex hot water heaters of their manufacture. One of them, an eight-page catalogue, is bound in highly colored paper covers, and within contains description with illustrations of the different forms of the Rex heaters, together with table of dimensions, capacities and prices. A second folder shows the application of the Rex heaters to various purposes. One is connected with a circulating boiler for supplying hot water in hotels, apartment houses, bathrooms, &c. The second sectional view shows a circulating boiler and heater, the former connected with a supply tank and supplying water to an adjacent bathroom. The third illustration shows the application of the Rex heater in a conservatory.

THE W. H. PAGE BOILER COMPANY of Norwich, Conn., have completed plans for a new foundry, which they propose to build in connection with their present plant, to accommodate increasing business.

THE AMERICAN RADIATOR COMPANY, New York, are sending to the trade an engraving on a fine cardboard of the new municipal building at Hamburg, Germany. With it is sent a newspaper clipping stating that the contract was closed at their World's Fair exhibit with the official engineers for four carloads of radiators for heating it, which is one of the largest orders taken at that office.

VICE-PRESIDENT PIERCE of the American Radiator Company is temporarily lending assistance at the New York office, where some night work has been necessary to give proper attention to their orders for radiators. F. S. Heywood is now talking radiation at the Chicago office.

C. B. THOMPSON AND C. C. FINKLER have purchased the interest of Frank Wheeler in the Illinois Heating Company, 88 Lake street, Chicago. As Mr. Wheeler resigned the presidency of the company, Mr. Thompson was elected to take his place. Mr. Finkler was elected secretary and treasurer.

Final estimates of the Kansas Board of Agriculture place the total wheat harvest of that State for the present year at 24,881,448 bushels, an increase of 5,000,000 bushels over the September estimate.

TRADE REPORT.

The Iron Market.

The terrific struggle for work continues, and on large orders accompanied by satisfactory terms of payment unprecedented prices are made. The sacrifice of all profits along the whole line, the low cost of raw materials and the reductions in labor have brought down the theoretical cost of manufacture to figures hitherto undreamt of in this country. We say advisedly "theoretical," because it is dependent upon full employment. To reach the condition begotten by a fairly well filled order book is what so many are striving for. Spot cash, too, fetches very low figures. In fact, the terms are so potent a factor now that reports as to prices accepted for prompt settlement are no criterion as to what could be done on transactions on the ordinary basis. This fact must be kept in mind steadily.

Pig Iron statistics reflect as closely as it is possible for any one article in the line of Iron products to do so the volume of current consumption. They show that we are still accumulating a little metal in spite of the fact that current production is only 43 per cent. of the normal output of say 9,000,000 tons per annum.

In a general way the conclusion is warranted that very few of the works throughout the country can touch the costs proclaimed by some, and that therefore any inferences based upon them as to the permanency of present values are dangerously unsafe to the buyer. That lasting reductions in the cost of producing Iron and Steel have been made no one will deny, but neither labor nor capital can long suffer as they are now doing. The present range of values is abnormal and cannot last long. Even now far more than half of the aggregate manufacturing capacity is helplessly out of the race. When consumers need their product they will have to accord prices which will pay them to start.

Pig Iron.—Buying in the New York market continues on a moderate scale. Sellers, notably of Southern Iron, are inclined to some firmness. An offer to take 15,000 tons of warrant Iron, which was widely circulated in this market during the past ten days, did not lead to any business, because no seller could be found to meet the buyer's views. We quote Northern brands $14 @ $15 for No. 1; $13 @ $14.25 for No. 2, at tidewater. Southern Iron, same delivery, $13.25 @ $14.25 for No. 1; $12.25 @ $13.25 for No. 2; $11.50 @ $12.25 for No. 3; $11.75 @ $12.25 for No. 2 Soft, and $12.25 @ $12.50 for No. 1 Soft.

The Pig Iron market in the Philadelphia district is about as dull and uninteresting as it possibly can be. Buyers appear to be utterly indifferent to low prices; if they need Iron they will order just a little; if they do not need it, price is no inducement. Sales therefore are to a great extent carload lots, 50 tons or 100 tons, and occasionally it may be a 200 or 300 ton lot at quoted rates, but on a larger lot special terms must be arranged, either by a concession in price, time for delivery, or in terms of payment. Sales are usually within the following range of prices, varying according to quantity, brand, delivery, terms of payment, &c.: $12.25 @ $12.75, delivered, for Plain No. 2; $13.75 @ $14 for No. 2x; $14.25 @ $14.50 for No. 1x.

The past week in the Chicago market is reported as having been quiet, with not even the rumor of a large sale. The few transactions reported in Coke Iron are principally in Southern brands. The situation is regarded by prominent dealers as one of waiting on the part of buyers. They believe that nothing favorable or unfavorable can be based on present conditions. Consumers are wholly at sea regarding the future, and not knowing what to do they naturally do nothing. Meanwhile everything hesitates. Quotations are now as follows for cash:

Lake Superior Charcoal.....	$16.00 @	$16.50
Local Coke Foundry, No. 1...	13.50 @	14.00
Local Coke Foundry, No. 2...	12.75 @	13.00
Local Coke Foundry, No. 3...	12.50 @	12.75
Local Scotch.....	14.00 @	14.50
Ohio Strong Softeners No. 1..	15.50 @	16.00
Southern Silvery, No. 1.	@	14.50
Southern Silvery, No. 2.....	@	14.00
Southern Coke, No. 2..... ...	12.35 @	12.60
Southern Coke, No. 3	11.60 @	11.85
Southern, No. 1, Soft.....	12.35 @	12.60
Southern, No. 2, Soft.....	11.85 @	12.10
Tennessee Charcoal, No. 1...	16.00 @	16.50
Alabama Car Wheel.....	18.50 @	18.75
Hocking Valley, No. 1	15 25 @	16.00
Jackson County Silvery.....	16.00 @	17.00

Advices from Pittsburgh describe the Pig Iron market in that section as being about as dull as it is possible for it to get, and with more Iron being made than is being used there does not seem to be any hope of improvement for some time. At furnaces in the Pittsburgh district, and in the valleys as well, large stocks of Iron are piled up, and these are being depleted very slowly, owing to the light demand. For ordinary lots ranging from 100 to 500 tons the following figures prevail, but on good sized blocks, with favorable time of payment, it is altogether probable that concessions would be offered. Quotations are as follows:

No. 1 Foundry	$12.75 @	$13.00,	cash.
No. 2 Foundry	11.75 @	12.00	"
Charcoal Foundry No. 1	14.00 @	15.00	"
Charcoal Foundry No. 2,	13.00 @	14.00	"

Reports from Southern markets indicate unusual dullness, even for these dull times. There has been about the usual current consumptive demand for car lots, but they seldom run above 200 tons each; and even the orders from the East have been for reduced quantities, and notwithstanding the comparatively light offerings of Southern Iron there is an ample supply for the wants of the trade. The stove works are buying generally in a small way, and while prices as a rule are sustained there have been concessions made in some instances. The current demand is mainly for No. 2 Foundry and No. 1 Soft, and for these pretty full quotations are realized. There appears to be no movement in Charcoal Iron. Collections are not improving much, if any. Quotations are as follows:

Southern Coke, No. 1.	$12.75 @	$13.00
Southern Coke No. 2.....	10.75 @	11.00
Southern Coke No. 3.....	10.25 @	10.50
Ohio Soft Stone Coal, No. 1....	15.50 @	16.00
Ohio Soft Stone Coal, No. 2....	14.50 @	14.75
Lake Superior Coke No. 1.....	15.00 @	15.25
Lake Superior Coke No. 2.	14.00 @	14.25
Hanging Rock Charcoal, No. 1..	18.50 @	19.00
Hanging Rock Charcoal, No. 2..	17.50 @	18.00
Tennessee Charcoal, No. 1.....	14.00 @	14.25
Tennessee Charcoal, No. 2.....	13.00 @	13.25
Standard Southern Car Wheel	17.75 @	18.00
Lake Superior Car Wheel and Malleable.....	17.00 @	17.25

Metal Market.

Pig Tin.—There has been a reverse movement in the price of this metal, the outcome of pressure by operators who have latterly figured with more or less prominence as "bears" in the speculative line and lack of support from the opposing interest. Comparatively little Tin has changed hands in a speculative way, however, except perhaps on old contracts, but the movement of stock into the channels of consumption has continued nearly up to the average for the season and the statistical position is stronger, if anything, at the present time, than it was prior to the reaction. However, the "bear" interest forced a decline of about 0.35¢ @ 0.40¢ in prices, carrying Straits to 20.65¢, regular terms, and 20.50¢ for immediate cash payment. At the close of the week under review the market was a trifle firmer, with 20.70¢ bid for current month delivery. Jobbers' prices for small lots are quoted at 22¢ for Straits Pig and 22½¢ for Banca Pig, with only a fair demand from consumers.

Copper.—There has been freer offering of Lake Superior Ingot by some of the smaller producers and by dealers, the outcome of which is reflected in a decline to 9¾¢ as common selling price. Some of the larger producers claim to

be sold ahead, and therefore place their quotations at 9⅞¢ @ 10¢, but it is an open secret that at least 250,000 pounds have been sold at 9¾¢, regular terms, and that offers were made openly at 9.70¢ on the Metal Exchange for deliveries running through the balance of the year. The cheaper varieties have fared no better. Electrolytic may easily be secured at 9⅝¢ @ 9½¢, and sales of common casting stock at above 9½¢ are the exception at present. In fact, it is intimated that those figures have been shaded, and that the general market is weaker below than above the surface, despite quite free movement of stock from this to European points of late. The domestic consumptive demand for Copper has not kept up to the level of the last few weeks; and a falling off in orders and inquiries is noted by dealers. Prices for small lots remain unchanged.

Sheet Copper.—The general state of suspense in which all business remains, pending the outcome of repeal at Washington, has been felt during the week in the market for Sheet Copper. Jobbers report a sensible slacking off in sales as well as in the number of inquiries. This is attributed to the contraction in building enterprises attendant on the recent money stringency and to conservatism among consumers, who do not purchase more material than they absolutely need for present use while the trade situation continues so unsatisfactory. Prices for small lots remain unchanged as per list.

Pig Lead.—Prices have undergone a sharp decline, and the market at this writing is in somewhat unsettled condition. Common Western Lead has been sold at from 3.70¢ down to 3.50¢. Between that range about 500 tons changed hands. Forced realization on speculative holdings is partly accountable for the decline, but there was some evidence of artificial pressure by a few local operators. At the close the market was about 3.45¢ bid, 3.55¢ asked. The consumptive demand for Pig Lead is quite small, such business as is current being usually confined to very moderate quantities; while retail prices are rather inclined to soften. American Pig is quoted for small lots at 4¼¢ @ 4⅜¢, but this rate might be shaded under favorable conditions.

Lead Pipe and Sheets.—Extreme dullness has settled down upon the market for Manufactured Lead. There is so little building doing at present that the demand for plumbers' supplies is of the slightest, nor is it thought, now the season is so far advanced, that much improvement is likely to occur uutil building is resumed in the spring, when, other things being favorable, a good business may be looked for, as stocks in consumers' hands are very narrow.

Spelter.—The market has been unsettled and irregular, with comparatively little business in this quarter and no sign of livelier demand from dealers or consumers at the decline. Ordinary Western brands have been secured at 3.65¢ @ 3.70¢, and the latter is at present a common selling price. Special brands bring about the usual premium. Jobbers' price for Western Spelter, in small lots, is given as 4¼¢ @ 4⅜¢ ℔ lb.

Antimony.—About the ordinary business has been effected and prices remain practically unchanged. We quote at 9¼¢ @ 9⅜¢ for Hallett's, 10¢ @ 10¼¢ for L. X., and 10⅛¢ @ 10¼¢ for Cookson's, in round lots, with an advance of ⅛¢ @ ¼¢ ℔ lb for small quantities.

Tin Plates.—The principal feature of the Tin Plate market during the week has been a revived demand for ordinary Bessemer Cokes, spot delivery, for canners' uses, which has drawn heavily on the stocks of certain descriptions of Plates, 100 lb in particular. These Plates are consequent'y somewhat scarce and command outside prices. A rather livelier interest has been manifested in future deliveries, but the business in this direction still continues extremely light, nor is it likely to grow to any considerable proportions until confidence is restored and money again flows readily in trade channels. A fair hand to mouth business is noted in Roofing Ternes, which suffices to keep the market from stagnation, but otherwise trade is quiet, prices remaining without radical change. Dealers' agents report the stocks of Tin Plates in all parts of the United States to be at an almost unprecedentedly low ebb, with no intention on the part of retailers and consumers to replenish them beyond the point of present requirements.

Sheet Iron.—Galvanized Iron is in fair demand, and as stocks are not large, while there are few signs of any immediate increase in the output of this material, some scarcity is looked for before long, which may induce an advance in price. Meantime the price continues unchanged per list. Black Iron shows considerable movement, as is natural at this season, and the mills that are now running appear to be busy. Still, consumptive orders are not up to their normal volume for the time of the year. Prices are, if anything, rather firmer and concessions on quoted rates harder to obtain, though not yet out of the realm of the obtainable where spot cash or other desirable inducements are offered.

THE EATON-RITCHELL COMPANY, manufacturers of Tinware, Denver, Col., have decided to remove to South Omaha, Neb., and will commence the erection of a plant at that point at once. The building will be 60 x 190 feet and will cost about $6000. The firm will give employment to 50 men.

AT THE TOP MILL, Wheeling, W. Va., operated by the Wheeling Iron & Steel Company, the 52-inch sheet mill is in operation, also one small sheet mill, each running double turn.

Chicago Report.

Scrap.—Inquiry is better, but actual sales are still slow. Dealers furnish the following list of buying prices, Chicago delivery:

	Per net ton.	Per lb
No. 1 Wrought Scrap	$8.00	....
Machinery Cast	7.00	....
Malleable Cast	6.00	....
Stove Plate (free of burnt)	5.00	....
Burnt Iron and Grate Bars	3.50	....
Sheet Iron and Hoops	2.00	....
Plow Steel and Breaking Stock	5.50	....
No. 2, such as Shovels, Hoes, &c	4.00	....
Old Boilers—whole (Iron)	4.00	....
" (Iron)—cut in single Sheets and Rings	6.00	....
Old Gas-Pipe and Boiler Tubes	5.00	....
Cast Borings	3.25	....
Turnings	4.00	....
Horseshoes	9.00	....
Copper Bottoms	....	5 ¢
Copper Clips and Heavy	....	7 ¢
Heavy Brass	....	5½¢
Light Brass	....	3½¢
Pipe Lead	....	2½¢
Tea Lead	....	2 ¢
Zinc	....	2 ¢
Rubber	....	2¼¢

Anthracite.—Business is good and considerable complaint is heard that deliveries are far behind on contracts. So little Coal has been sent here by vessel during the summer that much of the supply must be forwarded by rail from the mines. Reports from Colorado are to the effect that the Colorado Fuel & Iron Company are making plans to supply Anthracite as far East as Omaha in competition with Pennsylvania shippers. Carload lots of 12 net tons or over are quoted as follows:

	Grate.	Egg, Sto. and Ch.
Chicago, Ill	$5.85	$6.10
Milwaukee, Wis	5.85	6.10
Kansas City, Mo	9.05	9.30
Council Bluffs, Iowa	9.05	9.30
Lincoln, Neb	9.20	9.45
Sioux City, Iowa	9.05	9.30
Aberdeen, S. Dak	9.10	9.35
Dubuque, Iowa	7.15	7.40
Madison, Wis	7.35	7.60
St. Paul, Minn	8.35	8.60
Burlington, Iowa	7.35	7.60
Des Moines, Iowa	8.80	9.05
Davenport, Iowa	7.15	7.40
St. Joseph, Mo	9.05	9.30
Leavenworth, Kan	9.05	9.30
Omaha, Neb	9.05	9.30

Colorado Anthracite.

COLORADO FUEL & IRON COMPANY.

Denver	$8.00
Pueblo	8.00
Colorado Springs	8.00
Leadville	8.00
Cheyenne, Wyo	10.00
All points between Denver and Missouri River	9.35

THE LARGEST hot blast Dry Kiln for timber in Great Britain was shipped some months since to Manchester by the Huyett & Smith Mfg. Company, Detroit, Mich. Its successful operation resulted in an order for a duplication of the plant to go to Germany, and the house have recently opened an office in London to properly care for their growing trade abroad.

THE HAMMER HOUSE of the W. Dewees Wood Company, McKeesport, Pa., which has been idle for several weeks, has resumed in full. The steel mill has also resumed after a week's shut down, so that almost the entire mill is now in operation.

CONDITION OF THE

Hardware Trade.

SINCE the opening of October there has been a perceptible increase in the volume of business, but orders for the most part are small and jobbers report those received by them as very carefully assorted, covering a considerable range of goods in small quantities. As customary at this season, seasonable goods constitute a considerable portion of the business, but they are not moving in the usual quantities. Skates are referred to as in especially good demand, owing to the fact that stocks in dealers' hands were pretty generally cleared out last winter. In Builders' Hardware the demand is only moderate and limited principally to goods required to finish buildings in course of construction. Very little building is in progress, a fact which also accounts for the limited demand for Nails. A good deal of complaint is made in regard to Mechanics' Tools, of which much less than the usual quantity are being sold. In manufacturers' supplies also the volume of business is comparatively small and houses dealing in these lines of goods complain much more than those who handle or manufacture articles which go directly to the trade. A fair business is reported by dealers in Tin Plate, most of whose orders are referred to as coming from retailers and in comparatively small parcels. There are few quotable changes in price, but the market has rather a weak tone, the tendency being toward lower values. Collections on the whole are fair, but some houses refer to them as being difficult and unsatisfactory.

Advices from Chicago.—The Shelf Hardware jobbers were agreeably surprised the past week by a decided increase in their business. The character of the orders received, however, was about the same as previously, regular Hardware not constituting more than the recent proportion. The large numbers of very small orders sent in entailed an unusual amount of work. The packing force in several establishments was obliged to work for several nights in order to make prompt shipments, owing to the necessity of handling so many broken packages. It is an annoying feature of the present condition of the Hardware business. In ordinary time, with the demand running on full packages, there would have been no necessity whatever for night work in handling as large a volume of business as that of the past week. Quite a large number of Hardwaremen from the West have visited Chicago within the past few days in attendance at the fair. They report that business with them is not likely to be of a more than hand to mouth character this fall, because farmers are disposed to hold on to the bulk of their crops. The quantity so held is very large, but the means of providing better business is thus seen to be in hand whenever the farmers decide to sell. Heavy Hardware jobbers report a somewhat larger volume of business, but their trade is also running in the direction of very small orders requiring more than usual work to fill them. Collections are good; no complaint is heard on this score.

Notes on Prices.

Wire Nails.—The Wire Nail market continues in substantially the same condition as at our last report, and $1.30 may be named as a general price for carload lots at mill. Some of the manufacturers have endeavored to obtain a slightly higher figure, but on especially large or attractive orders it is understood that this price has been shaded. The volume of business is moderate, and none of the mills are running to their full capacity. They are careful to avoid an accumulation of stock, and in some cases have not been able to ship goods as fast as required, their orders being for the most part for immediate shipment. The tone of the market is not at all strong.

Advices from Chicago.—Wire Nail manufacturers report inquiries only moderate. Buyers who placed orders at very low prices some time since are complaining of trouble in getting delivery on such contracts and threats are made that the Nails will be bought elsewhere and the difference charged to the delinquent manufacturers unless they more speedily comply with their agreements. Prices on factory lots continue at $1.40 to $1.45, Chicago. Small lots are selling at $1.55 from stock.

Cut Nails.—Notwithstanding the fact that the demand is moderate, the market for Cut Nails seems this week to be in a slightly better condition than last week, and the quotation of $1 for carload lots at mill is quite generally adhered to, concessions being made in special cases. The market, however, is not strong, and it is not unlikely that a large order for a desirable assortment would secure relatively low figures. Small lots from store in New York are quoted at $1.25 to $1.30.

Advices from Chicago.—Cut Steel Nails are in the same condition as previously reported. Orders are not large but are moderately numerous. Manufacturers are still quoting carload lots at $1.20 to $1.25, and jobbers quote $1.30 for small lots from stock.

Barb Wire.—The market for Barb Wire is not in a very satisfactory condition, and somewhat lower prices have been developed. The quotation of $2.25 to $2.30 for Four-Point Galvanized at mill fairly represents the market, but a concession on the lower of these figures is made by some leading manufacturers. Painted is held regularly at 40 cents less. The volume of business is moderate, but it is understood that a good many small orders have been secured.

Advices from Chicago.—Manufacturers are doing a large business in Barb Wire. They have made decided inroads on the trade of jobbers, who report that for the past couple of weeks their business in this branch has been exceedingly light, while manufacturers talk much more cheerfully on the condition of the trade from their point of view. Carload lots of ordinary Galvanized Barb Wire are selling at $2.40, while Glidden is quoted at $2.50. The jobbing price for small lots of ordinary Galvanized Barb Wire from stock is $2.55.

Lawn Mowers.—The volume of business during the last season is referred to by the manufacturers as having been exceptionally heavy, the fact being that the 'low' prices which have ruled have induced a very large sale of the goods, the season on this line having practically closed so far as the manufacturers are concerned before the financial disturbance of the summer. The outlook for next year is regarded by the manufacturers as promising, provided general business conditions are reasonably favorable. An announcement in regard to the coming season is made by Dille & McGuire Mfg. Company, Richmond, Ind., for whom S. A. Haines, Indianapolis, Ind., is manager of sales department. Their catalogue, just issued, contains the following revised list of their Mowers, which is subject to a discount of 70 per cent.

Inch.	McGuire's Diamond. Style D.	Diamond High Grass. Style L.	Western. Style U.	Magic. Style W.	Crown. Style K.
8	.....	.....	....	.....	$12.00
10	$13.00	.....	$10.50	$9.50	13.00
12	14.00	.....	11.25	10.50	14.00
14	15.00	$22.00	12.00	11.25	15.00
16	16.00	23.00	13.00	12.00	16.00
18	17.00	25.00	14.00	13.00	17.00
20	.....	28.00	.....	.....	.....
24	.....	31.00	.....	.....	.....

Pony Lawn Mower, each.....$100

Oil and Gas Heaters.—The Oil and Gas Heaters put on the market by the Manhattan Brass Company, 44 Murray street, New York, and 506 Masonic Temple Building, Chicago, and illustrated in this issue, are sold at a discount of 25 per cent. from the following list:

Star Heaters.

	Each.
No. 40, Brass finish	$7.00
No. 40, Nickel "	7.75
No. 40, All Brass, including Cylinder	7.50
No. 44, Brass finish	8.00
No. 44, Nickel "	8.75
No. 44, All Brass, including Cylinder	8.50
No. 46, Brass finish	10.75
No. 46, Nickel "	12.00
No 46, All Brass, including Cylinder	11.25

No. 45, Brass finish	9 75
No. 45, Nickel "	10 75
No. 45, All Brass, including Cylinder	10.25

Hygienic Heaters.

	Each.
No. 48, Brass finish	11 00
No. 48, Nickel "	12.50
No. 49, Brass "	13 00
No. 49, Nickel "	14.50
No. 50, Brass "	14.50
No. 50, Nickel "	16.00
Gas Heater	5 00

Cordage.—Cordage at present is probably lower in price than for a long time. During the past few weeks, while there has been little quotable change, prices have been tending downward and are now slightly lower. Manila is maintained pretty firmly at 8 cents basis for large lots, f.o.b. factory or New York; but it is understood that in some special cases this quotation has been slightly shaded. Sisal and New Zealand are about ¼ cent lower than a few weeks ago. The volume of business is comparatively small and there is a good deal of competition among the manufacturers. The following are the present quotations for large lots, f.o.b. factory or New York, which are shaded in exceptional cases and are subject to a discount of 1½ per cent. for cash in ten days:

Manila, 7-16 in diam. and larger	℔ 8 ¢
" ⅜ in	℔ 8½¢
" ¼ and 5-16 in	℔ 9 ¢
" Tarred Rope	℔ 7½¢
" Hay Rope, Medium	℔ 8 ¢
Sisal, 7-16 in. and larger	℔ 6¼¢
" ⅜ in	℔ 6¾¢
" ¼ and 5-16 in	℔ 7¼¢
" Hay Rope	℔ 6¼¢
" Tarred Rope	℔ 5¾¢
" Medium Lath Yarn	℔ 6 ¢
New Zealand, 7-16 in. and larger	℔ 6 ¢
" ⅜ in	℔ 6¼¢
" ¼ and 5-16 in	℔ 6¾¢
" Hay Rope	℔ 6 ¢
" Tarred Rope	℔ 5½¢

Stove Boards.—While as seasonable goods there has been a fair demand for Stove Boards, the volume of business is referred to as considerably less than usual. In the matter of prices there has been comparatively little irregularity, as the leading makers agree pretty well in quotations. There is, however, some difference in the prices quoted, and careful buyers usually find it worth their while to look into the market before placing orders.

Glass.—Manufacturers of Glass evidently consider that the condition of trade does not justify them in starting up their factories. This apparently has more to do with the lack of interest which they take in an adjustment of the wage scale than because an agreement could not be reached. If there was a prospect of making money if the manufacture of Glass was begun and continued the fires would be started even if last season's wages had to be paid. It is reported that the low prices at which Glass has been sold to the jobbers who are members of the National Window Glass Association has left no profits for the manufacturers, and that they now feel that it would have been better if jobbers had not been admitted as members. The situation is intensified by the announcement of a further reduction in the price of foreign Glass on the other side. Quotations on all kinds of Glass remain unchanged.

Old Metals.—The market for Old Metals maintains the dullness reported last week, there being generally but little business doing beyond absolutely needed purchases. Heavy Cast Scrap Iron is, however, scarce and in fair demand. The following represent outside prices, New York delivery:

Heavy Copper	℔ 6¾¢
Light and Tinned Copper	℔ 6¼¢
Heavy Brass	℔ 5¼¢
Light Brass	℔ 4½¢
Lead	℔ 3¢
Tea Lead	℔ 2½¢
Zinc	℔ 2½¢
No. 1 Pewter	℔ 14¢
No. 2 Pewter	℔ 6¢
Wrought Scrap Iron, ℔ gross ton	$11.00 @ $12.00
Heavy Cast Scrap, ℔ gross ton	12.00 @ 13.00
Stove Plate Scrap, ℔ gross ton	7.00 @ 8.00
Burnt Iron (delivered at mill) ℔ gross ton	5.00 @ 6.00

Old Rags, Paper, &c.—Trade in these materials shows no improvement over last week. The demand is of the slightest description, consumers waiting a settlement of the silver question at Washington before making purchases. The quotations given below represent about the price of Old Rags, Paper, &c., delivered in New York:

No. 1 White Rags	℔ 3¼ @ 3½
No. 2 White Rags	℔ 2¼ @ 2½¢
Mixed Rags	℔ ¾¢
Blues and 3ds	℔ 1 @ 1¼¢
Hard Sized White Shavings	℔ 2¼¢
No. 1 White Book Shavings	℔ 2 @ 2⅜¢
No. 2 White Book Shavings	℔ 1 @ 1⅛¢
Light Book Shavings	℔ ¾¢
No. 1 Mixed Shavings	℔ ¾¢
No. 2 Mixed Shavings	℔ ½¢
No. 1 Printed Books	℔ 1 @ 1¼¢
Ordinary Mixed Books	℔ ½ @ ¾¢
Newspapers	℔ 3-5¢
No. 1 Manila Paper	℔ ¾ @ 1 ¢
No. 2 Manila Paper	℔ ⅝ @ ¾¢
Bogus Paper	℔ ½¢
Common Paper	℔ ¾ @ ½¢
Straw Chips	℔ ½ @ ⅝¢
Binders' Clippings	℔ ½ @ ⅝¢
Jute Butts	℔ 1¼ @ 1⅜¢
No. 1 Jute Bagging	℔ 1 ¢
Mixed Bagging	℔ ¾ @ 1 ¢
No. 2 Bagging	℔ ½ @ ¾¢
Hemp Twine	℔ 2¼¢
Manila Rope	℔ 2½¢
Jute Rope	℔ 1½ @ 1¾¢
Mixed Rope	℔ ⅝ @ ⅞¢

Old Rubber.—There is little or no market for Old Rubber at present. Prices at present ruling are about as follows:

Car Springs, ton lots, ℔.	@ $0.03¼
Rubber Shoes, carloads, delivered at factory, ℔.	@ .03
Rubber shoes, less than carloads, ℔.	0.02¼ @ .03⅛
Large Hose, ℔ ton	@ 9.00
White Wringer Rolls, ℔.	@ .04¼
White Syringes, ℔.	@ .05

Trade Notes.

I. P. FRINK, of 551 Pearl street, New York, writes us that he has been awarded a prize for superiority of Reflectors at the World's Columbian Exposition.

WE ARE IN RECEIPT of the fall catalogue of seasonable and other goods from C. Sidney Shepard & Co. of Chicago, the publication being issued under date of October 2. The first pages are devoted to Sheet Iron, Russia Iron, Galvanized Iron and Steel, with tables of prices and sizes, and Tin Plates, various grades being quoted, both bright and terne. Metals are likewise noted in the list, with Wire, Rivets, &c. Among the seasonable goods several pages are devoted to Stove Boards, Coal Hods, Fire Shovels, the latter line being particularly full. Adjustable Elbows and Heaters close the pamphlet.

SEVERAL MORE SHEET MILLS were put in operation last week at the plant of the Ætna-Standard Iron & Steel Company, Bridgeport, Ohio. All the sheet mills formerly included in the Standard plant are running except No. 9. The sheet mills of the Ætna works are not yet in operation. The three-high plate mill differences have been settled and it is now running.

AT THE WORKS of the Whitaker Iron Company, Wheeling, W. Va., four sheet mills are now in operation. Repairs and alterations are being rapidly made on three others and a new mill is being built. This will make eight sheet mills at this company's plant.

THE SWAMSCOT MACHINE COMPANY of South Newmarket, N. H., doing business in Boston under the firm name George K. Paul & Co., have assigned. It is hoped to pay creditors in full and to continue the plant in operation, which gives employment to practically the whole town of South Newmarket. The company's assets consist of bills receivable and cash amounting to $81,500; real estate, tools, machinery, &c., $110,000; stock in trade in store in Boston, $66,000. The debts amount to $140,000. The directors' object is to realize the best possible price on the stock in the store in Boston, pay up the debts, and thus free the corporation at South Newmarket.

A CERTIFICATE OF INCORPORATION is on file in the Hudson County Clerk's office in Jersey City for the Block Mfg. Company. The company are organized with a cash capital of $100,000, of which $50,000 has been paid in, for the manufacture of Tinware, Enameled and other Metallic Ware. The manufacturing plant will be erected at Union Hill.

W. H. ROUSH, Horton, Kan., has sold a half interest in his stove and tin business to his brother, A. J. Roush, the new firm being known as Roush Bros. Both members are practical tinsmiths and will increase their stock by other lines embracing the novelties of the times.

Owing to the accident to the cruiser "Montgomery," now at New London, Conn., the board of naval officers appointed to witness the trial of the vessel has been dissolved. It is estimated at the Navy Department that the accident and the delay will cost the builders, the Columbia Iron Works of Baltimore, fully $25,000; but this sum, it is said, could be materially reduced if the contractors will allow the trial to take place at once, notwithstanding the damage. Admiral Belknap's official report shows that while the injuries to her hull are serious, they are not such as to disable her. The damage cannot be determined until the ship is put in dry dock, but it is estimated that $10,000 will be necessary to repair her, and that the work will consume a month.

The estimated quantity of gold yielded from the mines of Victoria, Australia, from 1851 to 1892 is 58,101,429 ounces, valued at $1,115,547,437.

Professor Lippman is reported to have succeeded in photographing simultaneously all the colors of the rainbow on a layer of albumen.

WORLD'S FAIR NOTES.

R. E. Dietz Company of New York, and Steam Gauge & Lantern Company

of Syracuse, N. Y., who have a branch office at 25 Lake street, Chicago, have fitted up a joint exhibit of Lanterns and Oil Stoves in Manufactures Building, section N, block 3. Their space is 20 x 24 feet, inclosed by a neat railing in front, with counters for the display of goods on two sides and a wall in the rear on which shelves have been fitted, while a roof has been built over the top, composed wholly of Lanterns, with a row of Baby Lanterns in front, next Boy Lanterns, next Racket Lanterns, and the remainder up to the peak all tubular goods, with globes of different colors, making a very unique display. On the corners are globe and square street Lanterns, or corporation Lamps. Hanging from the eaves of the roof, like a fringe, extending completely around the space, are Baby Lanterns. Railroad goods are shown inside the pavilion, covering all kinds of Lanterns, from locomotive Headlights of great power and station Lamps of large size, down to very convenient and beautifully made hand Lanterns for conductors. The Reflector Lanterns are made for both oil and electricity. The display of Tubular Lanterns is very fine and covers many varieties, including Dashboard Lamps, which will neither blow out nor jar out. The Oil Stoves shown are manufactured by the R. E. Dietz Company, also on the tubular principle, and consist of both heating and cooking Stoves. The cooking Stoves are mounted on their own stands, so that they are complete in themselves. In capacity they correspond with a No. 8 cooking Stove. The special claim made for the tubular system on which the Dietz oil goods are constructed is that the oil is perfectly consumed, so that there is no odor, which is a very strong objection ordinarily made to the use of oil for heating, cooking or lighting. In a fine frame are shown the 35 medals received at different exhibitions by the R. E. Dietz Company.

The Erwin-Welch Hydraulic Machine Company

of Chicago have on exhibition, in operation, at Column I 34, Machinery Hall, their automatic hydraulic pump, water motors, automatic cellar drainer and a hydraulic ram of Rife's manufacture, at Roanoke, Va. In the last named, instead of a metal valve, a rubber one is used, which has been found to be a great improvement in not wearing the metal, while it may be adjusted to any pressure of water. Another feature which recommends the ram is that it automatically supplies itself with air. The automatic hydraulic pump above mentioned avoids dependence on the suburban storage tank, and is capable of supplying four or six families without the tank or from 40 to 50 with it.

The Walworth Mfg. Company

of Boston, Mass., have a large and comprehensive exhibit at Column O 27, Machinery Hall, of the many articles for which they have long been known as manufacturers. In a handsome case of ebony finish, supported by Ionic pillars, displayed against a black background, a beautifully finished assortment of nickel-plated steam and water fittings stands out in strong relief. Two sections of the Mills boiler, which they now manufacture, and the Walworth automatic sprinkler, are conspicuously shown. Cast iron fittings, valves and an extensive variety of expansion joints are displayed. The Ashley and Stillson wrenches, so well known as the product of this company, are tastefully arranged, while an attractive feature is the Hall tapping machine, which is used for tapping street mains of from 4 to 24 inches in diameter while under pressure. A brass railing surrounds the entire exhibit, while on each corner a support for street railway service, either for trolley wires or elevated system, blocks off their large space.

J. G. Hoffman

of Chicago, inventor of the Tornado fan blower, exhibits one at Column L 33, Machinery Hall. A forge of his design, supplied with a trough, is also shown. The Tornado fan blower has a combined crank and lever motion and gives an after blast the same as a bellows. There is no dead center and it can therefore be operated from any point with either a long or short stroke. All parts are interchangeable, and the fan shaft runs on hardened centers with self oiling supplies. These goods are manufactured by the Hurlbut Mfg. Company of Racine, Wis.

Allington & Curtis Mfg. Company

of East Saginaw, Mich., have one of their dust collectors in full operation at Column E 53, Machinery Hall, in connection with a Sturtevant fan. The efficiency of their collector is made apparent to every one who visits the exhibit.

Curtis & Curtis

of Bridgeport, Conn., exhibit samples of their specialties in pipe working tools at Column J 38, Machinery Hall. Among these are several power cutting and threading machines, the largest being shown belted up and in practical operation on 8-inch pipe. Half a dozen other sizes of such machines for either hand or power are exhibited, but not in operation. Two of them are mounted on bases with countershaft and driving pulleys attached, but the others consist merely of the cutting head, shown as a portable hand machine. All have samples of threaded pipe attached to show the exact work done on each size of machine. The Forbes die stock used in these machines is a complete tool, being all that is required to thread or cut off pipe, while much lighter than the old style of stock and the vise which must accompany it. With it one man can cut off and thread large pipe up to 8 inches diameter by hand and without assistance, while with the smaller sizes a boy can thread 2 and 3 inch pipe with but one hand on the crank. The bits draw back out of the way when the thread is cut. The parts are shown of an ingenious pipe and bolt threading attachment for lathes. This attachment has been devised to meet the wants of those whose work does not warrant the purchase of a regular power pipe threading machine. It can be fixed to any lathe within certain limits of size. It consists of a die carrying head attached to the spindle like a chuck, an adjustable self-centering vise attached to the carriage, and an adjustable pipe rest attached to the bed of the lathe to support long lengths of pipe. The feeding is done by hand, or an automatic feed can be arranged by setting the lead screw of the lathe to the number of threads corresponding to the standard of thread to be cut. Samples are shown of pipe vises, both hinged and solid frame, also reversible ratchet drills and reversible ratchet die stocks.

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Metal and Miscellaneous Prices.

CHICAGO, OCTOBER 12, 1893.

Tin—
Straits pigs.....23¢

Imported Tin Plates—
Charcoal Plates.—Bright.

Guaranteed Plates command special prices, according to quality.

		Per box.
Jalland and Melyn Grade	IC, 10 x 14	@ $6.75
	IC, 12 x 12	@ 6.75
	IC, 14 x 20	@ 6.75
	IC, 20 x 28	@ 13.50
	IX, 10 x 14	@ 8.75
	IX, 12 x 12	@ 8.75
	IX, 14 x 20	@ 8.75
	IX, 20 x 28	@ 17.50
Allaway Grade,	DC, 12½ x 17	@ 6.50
	DX, 12½ x 17	@ 8.50
"	IC, 10 x 14	@ 6.50
"	IC, 12 x 12	@ 6.50
"	IC, 14 x 20	@ 6.50
"	IC, 20 x 28	@ 13.00
"	IX, 14 x 20	@ 8.00
"	IX, 20 x 28	@ 16.00

Coke Plates—Bright.

	Per box.
Steel Coke—IC, 10x14, 14x20	$5.75 @ $5.85
IC, 14x20, 90 lb	5.50 @ 5.60
IC, 14x20, 100 lb	@ 5.85
10 x 20	8.75 @ 9.00
20 x 28	11.50 @ 12.70
X, 10x14, 14 x 20	@ 7.35
B.V. Grade. IC, 10x14, 14x20	5.85 @ 6.00

Charcoal Plates.—Terne.

Guaranteed Plates command special prices, according to quality.

Mansel and Dean Grades.—
IC, 14 x 20 ...@ $5.62½
20 x 28.....@ 11.25
IX, 20 x 28.....@ 14.25

Worcester Brand and equal.—
IC, 14 x 20.. 6.12½@ .....
IC, 20 x 28..12.25 @ .....
IX, 14 x 20.. 7.62½@ .....
20 x 28..15.25 @ .....

American Tin Plates.
Charcoal Plates.—Bright.

Irondale, A. A.—	IC, 14 x 20	$7.00
" "	IX, 14 x 20	9.00
" "	IXX, 14 x 20	11.00
" "	IC, 20 x 28	14.00
" "	IX, 20 x 28	18.00
" "	IXX, 20 x 28	22 00

Florence.—
IC, 10 x 14, 12 x 12, 14 x 20..$6.75
IX, 10 x 14, 12 x 12, 14 x 20.. 8.50

Palma.—
IC, 10 x 14, 12 x 12, 14 x 20..$7.25
IX, 10 x 14, 12 x 12, 14 x 20.. 9.25

Each extra cross $2.00 and 20 x 28 double these prices.

Brilliant, Tissue Packed, IC, 14 x 20,	$9.25
Royal, extra, IC, 14 x 20	7.25
Merion, IC, 14 x 20	7.00
Almond, IC, 14 x 20	6.50
Mint, IC, 14 x 20	6.25

Coke Plates.—Bright.

Elwood.—IC, 14 x 20	$6.00
" IC, 20 x 28	12.50

Roofing Plates.

Arch, IC, 20 x 28	@ $11.75
Crescent, IC, 20 x 28	@ 12.25
Crescent, IX, 20 x 28	@ 15.25
Empire, IC, 20 x 28	@ 12.50
Empire, IX, 20 x 28	@ 15.50
Hickory, IC, 20 x 28	@ 12.75
" IX, 20 x 28	@ 15.75
Alaska (heavily coated), IC, 20x28	@ $14.50
Alaska IX, 20 x 28	@ 17.75
Special, IC, 20 x 28	@ 15.50
" IX, 20 x 28	@ 18.50
Merchant's Roofing (extra coated), IC, 20 x 28	@ 17.75
Merchant's Roofing (extra coated), IX, 20 x 28	@ $21.50
Merchant's Old Method, (extra heavily coated), IC, 20 x 28	@ $19.75
Merchant's Old Method (extra heavily coated), IX, 20 x 28	$23.60
Irondale A: IC, 14 x 20	$6.25
IX, 14 x 20	7.75
IC, 20 x 28	12.50
IX, 20 x 28	15.50
Westmoreland: IC, 14 x 20	$6.25
IC, 20 x 28	12.50
Elwood: IC, 20 x 28	$12.00
Juno: IC, 14 x 20	$5.75
IC, 20 x 28	11.50
Illinois, Old Method: IC, 20 x 28	$17.00
E. L.: IC, 20 x 28	$12.50
Jessie: IC, 20 x 28	$12.00
Scott's Extra Coated, Stamped and Resquared, IC, 14 x 20	$9.50
Scott's Extra Coated, Stamped and Resquared, IX, 14 x 20	11.00
Scott's Extra Coated, Stamped and Resquared, IC, 20 x 28	19.00
Scott's Extra Coated, Stamped and Resquared, IX, 20 x 28	22.00
Neville, Stamped, IC, 14 x 20	6.25
" " IX, 14 x 20	7.50
" " IC, 20 x 28	12.50
" " IX, 20 x 28	15.00
Taylor's Old Style, IC, 14 x 20 (Stamped and Resquared)	$9.50
Taylor's Old Style, IC, 20 x 28 (Stamped and Resquared)	19.00
Taylor's Roofing, IC, 14 x 20 (Stamped and Resquared)	8.25
Taylor's Roofing, IC, 20 x 28 (Stamped and Resquared)	16.50
Columbia, IC, 14 x 20 (Stamped)	7.25
" IC, 20 x 28 (Stamped)	14.50
Maple, IC, 14 x 20 (Stamped)	6.75
" IC, 20 x 28 (Stamped)	13.50
Willow, IC, 14 x 20	6.50
" IC, 20 x 28	13.00
Knoxall, IC, 14 x 20	6.25
" IC, 20 x 28	12.50
Globe, IC, 14 x 20	6.00
" IC, 20 x 28	12.00
Miami, IC, 14 x 20	6.00
" IC, 20 x 28	12.00
" IX, 20 x 28	15.00
" (Redipped), IC, 20 x 28	17.00

Tin Boiler Plates.

	Per box of 100 sheets.	Per box of 112 sheets.
X, 14 x 28	$13.00	$13.00
XX, 14 x 28	14.50	14.50
X, 14 x 31	14.50	15.80
XX, 14 x 31	16.50	17.50

	Per box of 56 sheets.	
X, 14 x 56	29.50	16.50
XX, 14 x 56	32.50	18.20
X, 14 x 60	31.50	17.65
XX, 14 x 60	35.50	20.90

Sheet Iron—
Black.

	Common American	Refined.
Nos. 10 to 16	₩ lb 2 6 10¢	3 2-10¢
17 to 20	₩ lb 2 7-10¢	3 3-10¢
21 to 24	₩ lb 2 8-10¢	3 4-10¢
25 and 26	₩ lb 2 9-10¢	3 5-10¢
27	₩ lb 3¢	3 6 10¢

Russia, Planished, &c.

Genuine Russia, all numbers....13¢ net.
Patent Planished....₩ lb A, 10½¢; B, 9½¢ dis. 5%
Craig's Polished.....8½¢

Galvanized.

Juniata or first quality.....dis. 70&5%

Copper—
Ingot.

Lake.....11¾¢ @ 12¼¢
Casting Brands.....11¢ @ 11⅝¢

Sheet and Bolt.

Discount, 25%.

Copper Bottoms.

Discount, 25%.

Seamless Brass and Copper Tubes.

Base price, 17½¢, Chicago, with extras according to size.

Copper, Bronze and Gilding Tube, 3¢ ₩ lb additional.

Brazed Brass Tubing.
(To No. 20 inclusive.)

Add freight from New York to Chicago to these prices, or 50¢ ₩ 100 lb.

Above 5-16 inch to 3 inch inclu...	35¢
Plain, above 3 inch	45¢
Plain, 5-16 inch	45¢
Plain, ¼ inch	60¢
Plain, 3-16 inch	$1.00
Plain, ⅛ inch	$1.50
Fancy Tubing, Brass, to No. 20 incl	43¢ ₩ lb
Bronze Tubing, 3¢ ₩ lb more than Brass	

40 @ 45%

Roll and Sheet Brass.

Discount, 35 @ 40%.

Slab Spelter—
Western Spelter.....5

Sheet Zinc—
600 lb casks.....5 ¢
300 lb casks.....5½¢
Loose sheets.....5½¢

Lead—
Soft Pig Lead.....4½¢
Bar.....4.60¢@5¢
Pipe.....5½¢, dis. 10¢
Block Tin Pipe.....35¢
Sheet.....6¢, dis. 10%

Solder—
½&⅛.....13¢@13¼¢
Extra Wiping.....11½¢

The prices of the many other qualities of Solder in the market indicated by private brands vary according to composition.

Antimony—
Cookson.....12¢@12½¢
Hallett's.....11¼¢@11⅝¢

Wrought-Iron Pipe—
List on following page.

1¼ and under, Plain	57½&10%
1¼ and under, Galv	52½&10%
1⅛ and over, Plain	67½&10%
1⅛ and over, Galv	60&10%
Boiler Tubes, list Oct. 24, 1892	65@67½%
Casing, list Nov. 16, 1892	52½%
Inserted Joints Casing, list Nov. 16, 1892	47½%
Steel Boiler Tubes	27½%
Cold Drawn Seamless Steel Tubing	50%

Cast-Iron Soil Pipe—
Cast-iron Soil-Pipe, Tarred; sizes 2 to 6 inches, inclusive.....dis 70&2½%
Other sizes.....dis 60%

Leader Pipes—

Abendroth's Galv. Spiral Riveted	60%
Austin's Corrugated	60%
Gordon & Gilbert's Corrugated	60%
Ritchie's (Galv. Iron only) Cor'd	60%
Ritchie's Spiral Lock Seam, Galv'd	50%
Austin's Spiral Ribbed Pipe	60%
Plain Adjustable Elbows	60%
James A. Miller Bros. (Galv'd Iron only) Corrugated	60%

Furnace Fittings—
Discount from Excelsior Steel Furnace Co's list.....50%

Steel Roofing—

Perfection	$3.75 square
Climax	$3.50 square
The Lloyd Spanish Tiling	$4.50 square

Metallic Shingles—

Cushman's	$1.25 square
Merchant & Co.'s Spanish Tiles: Copper, 14 oz	$36.00 square
Tin	$9.75@$14.25 square
Steel, painted	$9.00 square

Drain Pipe—
Discount from list.....50%

Paints, Oils, &c.—

Deodorized Benzine	7½@8 ¢
Iron Paint, Bright Red	₩ lb, 2 ¢
" " Brown	₩ lb, 1½¢
" " Purple	₩ lb, 2½¢
" Ground in oil, B. Red	₩ lb, 6½¢
" Ground in oil, Red	₩ lb, 6½¢
" Ground in oil, Brown	₩ lb, 5½¢
" Ground in oil, Purple	₩ lb, 6 ¢
Linseed Oil, Boiled, in bbls	40¢
Linseed Oil, Raw, in bbls	37¢
Mineral Paints	2@4¢
Orange Mineral	10½¢
Pure White Lead in Oil	6¾@7¼¢
Dry White Lead in bbls	6¼@6¾¢
Red Lead, American	7@7½¢
Red Venetian, English, dry	$1.65@$1.70
Red Venetian in oil; asst'd cans, 8½¢; kegs	7½¢
Sipe's Japan Oil, in bbls, ₩ gal	34¢
Spirits Turpentine, in bbls., ₩ gal.	33½¢
Asphaltum, Trinidad Refined, ₩ ton	$45
Tarred Felt, 1 Ply, ₩ 100 lb	$1.60
Tarred Felt, 2 Ply, ₩ roll 108 sq. feet	$1.25
Tarred Felt, 3 Ply, ₩ roll of 108 sq. feet	$1.7
Roofing Pitch, lb bbl. of 300 lb	$3.0

NEW YORK, OCTOBER 13, 1893.

The following quotations are for small lots.

Aluminum—
No. 2 Grade Metal, in ton lots..₩ lb, $0.75
No 1 (guaranteed to be 98 % pure and over), in ton lots.....₩ lb .90
Lots less than 1 ton, 10¢ ₩ lb additional.

Antimony—
Cookson.....₩ lb, 11¢
Hallett's.....₩ lb, 10½¢

Brass—
Planished.....net
Roll and Sheet.....35@40%

Brass and Copper Tubes
Brazed Brass Tubing—
List May 20, 1889.

	Per lb.
Plain, to No. 20 inclusive, above 5-16 inch to 3 inch inclusive	$0.35
Plain, to No. 20, above 3 inch	45
Plain, 5-16 inch to No. 20	45
Plain, ¼ inch	60
Plain, 3-16 inch	1.00
Plain, ⅛ inch	1.50
Fancy Tubing to No. 20, inclu...	43

35@40%

Copper and Bronze Tubing—
3¢ ₩ lb more than brass.

Bronze, Tobin—
Drawn Rods for Bolts, Forgings, &c

Over ¼ to 3½ inches inclusive....17¢ ₩ lb
Over 3½ to 5 inches inclusive.....18¢ ₩ lb

Piston Rods, Finished True, Smooth and Straight.

Over ¼ to 3½ inches inclusive....18¢ ₩ lb
Over 3½ to 5 inches inclusive.....19¢ ₩ lb

Clips—
Buffalo Damper: Nos. 1, $1.25; 2, $2.50 per doz.....40&10%

Conductors—
Corrugated. *Round or Square—*

Galvanized	60%
Galvanized, Locked Joints	60%
Tin	60%

Spiral Riveted—

Galvanized	50%

See also *Elbows and Shoes; Eave-Trough Miters; Strainers, Conductor.*

Conductor Strainers—See *Strainers, Conductor.*

Copper—
Bottoms, Pits and Flats....25@25&5%

Ingot.

Lake	11¢
Ansonia Grade Arizona	10½¢
Ansonia Grade Casting	10¢
Planished	net
Sheet and Bolt	25&25&5%

Tubes—See *Seamless Brass Tubes.*

Coppers, Soldering—
See *Irons, Soldering*, in Current Hardware Prices.

Damper Clips Buffalo—
See Clips, Buffalo Damper.

Eave Troughs—
Lap or Slip Joint, Galvanized.....60&10%
Lap or Slip Joint Terne.....60%

Eave-Trough Mitres—
Lap or Slip Joint.....list, net

Elbows—
Plain Adjustable—

Tin	70%
Galvanized	70%

Crimped Tubing—

Re-Tinned or Galvanized	35%

Stove-Pipe—
Buffalo Four-Piece.

4½	5	5½	6	7 inch,
$0.78	.87	.90	.99	1.20 per doz..20 %

Elbows and Shoes—
Flat Crimp.

Tin	35%
Galvanized	35%

Corrugated.
Flat Crimp.

Galvanized	60%

Round or Square.

Tin	60%
Galvanized	60%

Iron, Sheet—
Black.

	Common American	R. G. Cleaned American.
Nos. 10 to 16	₩ lb, 2¼	3 10¢
Nos. 17 to 20	₩ lb, 2.85	3.10¢
Nos. 21 to 24	₩ lb, 2.90	3.20¢
Nos. 25 and 26	₩ lb, 3.05	3.30¢
No. 27	₩ lb, 3.15	3.40¢
No. 28	₩ lb, 3¼	3½¢
American B. B.	₩ lb,	4¢@4½¢

Russia, Planished, &c.

Genuine Russia, according to assortment.....₩ lb, 11¾@12¼¢
Patent Planished....₩ lb, A, 10¢; B, 9¢, 5%
Craig Polished Sheet.....₩ lb, 8½¢

Galvanized.

	B. B.
Nos. 10 to 16	70&2½%@ 70&5%
Nos. 17 to 22	
Nos. 23 to 24	
Nos. 25 to 26	
No. 27	
No. 28	
Nos. 29 and 30	

Filter Joints—
Lee's.....33⅓

Lead—

American Pig	4¼¢@4⅜¢
Bar	4½¢
Pipe	6¼¢, 20%
Tin Lined Pipe	15¢, 20%
Block Tin Pipe	37½¢, 20%
Sheet	7¢, 20%

Old Lead in exchange, 3¼¢ ₩ lb.

Metal, Expanded—
Manufacturers' list No. 5.

Lathing	10%
Fencing, Painted Sheets	20%
Netting, Painted Sheets	20%
Door Mats, Galvanized	25%
Window Guards, Paneled	15%
Tree Guards, Paneled	15%

Mitres Eave-Trough—See *Eave-Trough Mitres.*

Paints Oils &c.—

Lead, Amn. White, in oil	6¾ @ 7¼
Lead, Red, bbls. and ⅛ bbls	6½ @ 7
Lead, Red, kegs	6¾ @ 7
Ocher, American	1 @ 1¼
Red, Venetian, American	1½ @ 2½

Linseed Oil:
Raw, ₩ gal..... @ .40
Boiled..... @ .43
Spirits Turpentine:
In bbls..... @ .32
Putty:
In barrels and ½ bbls..... .01⅝@.01¾
In tubs..... .01⅝@.01¾
In tin cans..... .01⅞@.02¼
In bladders..... .01⅞@.02¼
Roofing Material, &c.:
Asphaltum, Trinidad Refined, ₩ ton..... $30.00@$35.00
Asphaltum, Rock, ₩ ton..... $14.00
Coal Tar Felt, 1 Ply, ₩ ℔..... 2¢
Coal Tar Felt, 2 Ply, ₩ roll 108 sq. ft. $1.42½
Coal Tar Felt, 3 Ply, ₩ roll 108 sq. ft. $1.85
Roofing Pitch, ₩ bbl..... $2.26

Pipe, Drain 50%

Pipe and Fittings, Cast Iron Soil—

Cast-Iron Soil Pipe, Tarred, sizes 2 to 6 Inches, inclusive..... 60@60&10%
Other sizes..... 55@55&10%
Cast-Iron Fittings, Tarred, sizes 2 to 6 inches..... 60@60&10%
Other sizes..... 55@55&10%

Pipe, Spiral—

Galvanized..... 60%
Tin..... 60%

Rock and Slag Wool—

	₩ ℔	₩ cub. foot.
Slag Wool, ordinary	1¼	15¢
Slag Wool, extra	4¼	38½¢
Rock Wool, ordinary	2¼	27¢
Rock Wool, extra	7¼	43½¢

Rosin—

Common and Good—Strained,
Rosin, C. & D..... ₩ bbl. $1.02@$1.05
Rosin, E. & F..... ₩ bbl. $1.15@$1.30
Rosin, G. & H..... ₩ bbl. $1.45@$1.70
Rosin, I. & K..... ₩ bbl. $1.90@$2.35
Rosin, M. & N..... ₩ bbl $2.50@$3.50

Seamless Brass Tubes..net

Shoes and Elbows—See *Elbows and Shoes.*

Slate Roofing—

According to size, f.o.b. cars, Quarry Station.

Pennsylvania:
Best Bangor, ₩ sqr..... $3.25@$4.50
Pen Argyle, ₩ sqr..... 3.50@ 4.25
Peach Bottom, ₩ sqr..... 5.00@ 6.25
No. 1 Chapman, ₩ sqr..... 4.00@ 4.65
Lehigh Slates, ₩ sqr..... 3.00@ 4.50
Vermont:
Sea Green, ₩ sqr..... 2.70@ 3.20
Purple, ₩ sqr..... 3.50@ 4.50
Unfading Green, ₩ sqr..... 3.50@ 4.00
Red, ₩ sqr..... 9.75@12.00

Solder and Soldering Fluids—

Solder—

½ & ¼ (Guaranteed)..... 13½@14½¢
No. 1..... 11¾@12 ¢
Prices of Solder indicated by private brands vary according to composition.

Soldering Fluids—

Concentrated Soldering Flux.
f.o.b. New York.
In barrels, ₩ ℔..... 4¢
Smaller quantities, ₩ ℔..... 5¢

Gedney's Soldering Fluid.
In carboys or barrels, ₩ ℔..... 2¢
$1.50 for carboy or barrel; money refunded when returned.

Perfection Soldering Flux.
No charge for package.
Bbls., about 500 ℔, ₩ ℔..... 3½¢
½ bbls., about 300 ℔, ₩ ℔..... 4¢
Kegs, about 110 ℔, ₩ ℔..... 4¢
Kegs, about 55 ℔, ₩ ℔..... 4¢
} 5% dis.
75¢ extra for keg.

Yager's Soldering Salts.
¼-℔ bottles, each..... 30¢
Large quantities, per ℔..... 40¢

Spelter—

Western Spelter..... 4½¢@4¾¢
Bertha..... 8¼¢@9¢

Spiral Pipe—See *Pipe, Spiral.*

Stove-Pipe Elbows—*See Elbows, Stove Pipe.*

Stove Polish—See *Polish, Stove.*

Stove Trucks—See *Trucks, Stove.*

Strainers Conductor—

Galvanized..... 60%

Tin, Pigs and Bars—

Banca, pigs, ₩ ℔..... 22½¢
Straits, pigs, ₩ ℔..... 22¢
Straits in bars, ₩ ℔..... 23¢

Tin Plates—

American Terne Plates—

Alaska (re-squared) IC, 14 x 20..... $7.00
Alderly, extra quality, IC, 14 x 20..6.37½
Allegheny, IC, 14 x 20..... 6.12
" " IX, 14 x 20..... 6.38
Apollo Roofing, IC, 14 x 20..... 6.25
" " " IX, 14 x 20..... 7.25
Bonus, Extra Coated, IC, 14 x 20.... 6.75
" " " IX, 14 x 20.... 8.25
Buckeye, IC, 14 x 20..... 7.00
" " IX, 14 x 20..... 8.25
Chicago, IC, 20 x 28..... 11.50
Central, IC, 14 x 20..... 5.37½
Climax, IC, 14 x 20..... 5.70
Columbia, IC, 14 x 20..... 7 00
Crescent, IC, 14 x 20..... 6.00
Dunlap's Double Dipped, IC, 14 x 20 8.25
" " " IX, 14 x 20 9.50
" Domestic, IC, 20 x 28..... 12.00
" " IX, 20 x 28..... 15.00
Empire, IC, 14 x 20..... 6.12½
Extra Central, IC, 14 x 20..... 5.62½
First New York, IC, 14 x 20..... 5.75
First New Jersey, IC, 14 x 20..... 5.75
Flag, IC, 14 x 20..... 5.50
Fort Pitt, IC, 20 x 28..... 11.00
Globe, IC, 14 x 20..... 5.75
Hamilton's Best Redipped, IC, 14x20 9.25
" " " IX, 14x20 10.75
Hickory (Resquared), IC, 14 x 20..6.37½
Juno, IC, 14 x 20..... 5.75
Kensington, IC, 14 x 20..... 6.75
" IX, 14 x 20..... 8.00
Knoxall, IC, 14 x 20..... 6.00
Laufman's Apollo (Resquared), IC, 14 x 20..... 8.12
Laufman's Apollo (Resquared), IX, 14 x 20..... 9.37
Leominster, Extra Coated, IC, 14x20 7.75
Lion (Stamped), IC, 14 x 20..... 6.25
Lula, Best Charcoal, IC, 20 x 28..12.50
" " " IX, 20 x 28....16.00
Manhattan, IC, 14 x 20..... 7.00
Maple, IC, 14 x 20..... 6.50
Merchant's Old Method (Resquared), IC, 14 x 20..... 9.50
Merchant's Roofing (Resquared), IC, 14 x 20..... 8.50
McKinley, IC, 20 x 28..... 12.00
" IX, 20 x 28..... 15.00
Neville, IC, 14 x 20..... 6.00
" IX, 14 x 20..... 7.25
N. F. Old Style, IC, 14 x 20..... 7.50
" IX, 14 x 20..... 9.00
Old Colony, IC, 14 x 20..... 8.00
Optimus, Best Redipped, IC, 14 x 20 8.25
" " IX, 14 x 20 9.50
Osceola, Hand Coated, IC, 14 x 20.. 8.25
" " IX, 14 x 20.. 9.75
Palacio, IC, 14 x 20..... 5.55
Pennsylvania Old Method (Treble Coated), IC, 14 x 20..... 8.50
Phœnix, IC, 14 x 20..... 5.80
Scott's Extra Coated (Resquared), IC, 14 x 20..... 9.25
Scott's Extra Coated (Resquared), IX, 14 x 20..... 10.75
Taylor Old Style (Resquared), IC, 14 x 20..... 9.25
Taylor Roofing, IC, 14 x 20..... 8.00
Thomson's Puritan, IC, 14 x 20..... 5.75
Tip Top, IC (Resquared), 14 x 20.... 6.62
" " IX 14 x 20.... 7.88
U. S. Monongahela, IC, 14 x 20..... 6.50
U. S. Redipped, IC, 14 x 20..... 9.25
Venux, IC, 14 x 20..... 5.60
Waldo Redipped, IC, 14 x 20..... 7.25
Westmoreland, IC, 14 x 20..... 6.25
Wilkinsburg Redipped, IC, 20 x 28.16.00
" " IX, 20 x 28.19.00
Willow, IC, 14 x 20..... 6.25

American Bright Plates—

Almond, IC, 14 x 20..... $6.25
Brilliant (Tissue Packed), IC, 14x20. 6.00
Climax, IC, 14 x 20..... 6.50
" IX, 14 x 20..... 8.00
Florence, IC, 14x20..... 6.75
Hazel, IC, 14x20..... 5.85
Linden, IC, 14x20..... 6.50
Merchant's Dipped, IC, 14x20..... 11.00
Merion, IC, 14x20..... 6.75
Mint, IC, 14x20..... 6.00
Palma Xtra, IC, 14x20..... 7.25
Phœnix, IC, 14x20..... 6.25
" IX, 14x20..... 7.75
Royal, Extra, IC, 14x20..... 7.00
U. S., IC, 14x20..... 7 25

Imported Terne Plates—

Charcoal.
Dean Grade.—IC, 14 x 20.....@$5.50
" 20 x 28.....@11.00
" IX, 14 x 20.....@ 6.75
" 20 x 28.....@13.50
Abercarne Grade.—IC, 14 x 20.....@ 5.40
" 20 x 28.....@10.80
" IX, 14 x 20...@ 6.62½
" 20 x 28.....@13.25

Imported Bright Plates—

Charcoal.
Duty: 2.2¢ ₩ ℔.

Melyn and Calland Grade.	IC, 10 x 14	@$6.50
" "	IC, 12 x 12	@ 6.75
" "	IC, 14 x 20	@ 6.50
" "	IC, 20 x 28	@13.00
" "	IX, 10 x 14	@ 8.50
" "	IX, 12 x 12	@ 8.75
" "	IX, 14 x 20	@ 8.50
" "	IX, 20 x 28	@17.00
" "	DC, 12½ x 17	@ 6.00
" "	DX, 12½ x 17	@ 8.00
Allaway Grade.	IC, 10 x 14	@ 6.00
" "	IC, 12 x 12	@ 6.25
" "	IC 14 x 20	@ 6.00
" "	IC, 20 x 28	@12.00
" "	IX, 10 x 14	@ 7.50
" "	IX, 12 x 12	@ 7.75
" "	IX, 14 x 20	@ 7.50
" "	IX, 20 x 28	@15.00
" "	DC, 12½ x 17	@ 5.50
" "	DX, 12½ x 17	@ 7.00

Coke.
Steel Coke.—IC, 10x14, 14x20.$5.40@$5.50
" 10x20..... @ 8.50
" 20x28.11.50@12.00
" IX, 10x14, 14x20..... @ 6.75
B. V. Grade.—IC, 10x14, 14x20.... @ 5.50

Imported Boiler Plates.—

IXX, 14x26..(112 sheets)..... @$13.38
IXX, 14x28..(112 sheets)..... @ 14.50
IXX, 14x31..(112 sheets)..... @ 16.00

Tinning—Brass and Copper.....net

Tubing—Tin..... 55%
Galvanized..... 55%

Brass and Copper.—Standard List..... 35@40%

Troughs, Eave—See *Eave Troughs*

Trucks, Stove—Improved Lock Frame, per doz.....$15.00
Steel Lock Frame, per doz..... 18.00
Daisy Improved Pattern, ₩ doz..... 18.00

Zinc—600 ℔ casks..... ₩ ℔ 5¾¢
Per ℔..... 6¼¢

MANUFACTURING.

Machinery.

Among orders received by A. L. Ide & Son of Springfield, Ill., during the last ten days are the following: One 100 horse-power Ideal engine for the Ludington Building, second order; one 125 horse power engine for the Hoopeston Canning Company, Hoopeston, Ill.; three 175 horse-power Ideal tandem compound engines for the new Stock Exchange Building, Chicago; two 125 horse-power and one 100 horse-power Ideal engines for the Southern Hotel, St. Louis. The Stock Exchange and the Southern Hotel engines are all to have General Electric Company multipolar armatures directly attached to their crank shafts, the stock Exchange engines driving 100 K. W. machines and the Southern Hotel engines driving 50 K. W. machines. The two 125 horse-power engines each drive in addition one 50 arc light dynamo bolted from its governor pulley.

The newly incorporated firm of Harrington, Son & Co., Philadelphia, will erect a large machine plant.

The Lehigh Valley Railroad shops, at Easton, Pa., are now working full handed on full time.

Frisbie Elevator & Mfg. Company, New Haven, Conn., have recently put in what is said to be one of the largest electric elevators ever built. It is located in the car house of the Consolidated Street Railway Company, Worcester, Mass., and is used for elevating cars. Its capacity is 9 tons, with platform 34 x 10 feet and 15 feet high.

The W. H. Page Boiler Company of Norwich, Conn., have completed plans for a new foundry, which they propose to build in connection with their present plant, to accommodate increasing business.

The machine shops of the Southern Pacific Railroad Company, which for some time past have been working but four days per week and eight hours a day, are now running on full time with a full force.

The Hay-Budden Mfg. Company of Brooklyn, N. Y., have been incorporated to manufacture and sell dies and anvils and carry on a general forging and blacksmithing business. The capital is $20,000.

The National Iron Works and the Vulcan Brass Works, at Cleveland, Ohio, have been damaged by fire, the former sustaining a loss of $7000 and the latter $4500.

John Adt & Son, well-known builders of machinery at New Haven, Conn., are operating their plant with about one-quarter of their usual force, eight hours a day and six days a week. While the tone of business with them has considerably improved during the last month, they do not look forward to any considerable improvement in the situation until Congress takes action on the tariff question.

Thurman & Powell, machinists and foundrymen of Louisville, Ky., have assigned. The assets are $36,468.29, and the liabilities $31,401.49.

The Swamscot Machine Company of South Newmarket, N. H., doing business in Boston under the firm name of George K. Paul & Co., have assigned. It is hoped to pay creditors in full, and to continue the plant in operation, which gives employment to practically the whole town of South Newmarket. The company's assets consist of bills receivable and cash amounting to $81,500; real estate, tools, machinery, &c., $110,000; stock in trade in store in Boston, $66,000. The debts amount to $140,000. The directors' object is to realize the best possible price on the stock in the store in Boston, pay up the debts and thus free the corporation at South Newmarket.

The Finance Committee of Montreal, Canada, have recommended to the Council the purchase of a Worthington high duty pumping engine having a capacity of 12,000,000 United States, or 10,000,000 Imperial gallons of water per 24 hours. The Worthington Company offer to deliver and install within 60 days from the closing of the World's Columbian Exposition the pumping engine now on exhibition at the fair for the sum of $55,000. The engine in question is of the same type and capacity as the one already in operation at Montreal, so that the water capacity of that city will be doubled.

Hardware.

The cutlers of the Humason & Beckley Mfg. Company, New Britain, Conn., have resumed work.

The nailers and the Laughlin Nail Company, Martin's Ferry, Ohio, have come to an agreement, the former accepting the 15 per cent. reduction in wages proposed by the company. The works are again in operation, giving employment to nearly 700 hands.

The implement works of the Parlin & Orendorff Company, Canton, Ill., have resumed work with 800 employees.

The Parker Mills Nail Works, Wareham, Mass., which have been idle for six weeks, have started up.

The Eaton-Ritchell Company, manufacturers of tinware, Denver, Col., have decided to remove to South Omaha, Neb., and will commence the erection of a plant at that point at once. The building will be 60 x 190 feet and will cost about $6000. The firm will give employment to 50 men.

The Birmingham Iron Foundry, founders and machinists, Birmingham, Conn., continues to run six days a week, with nearly a full complement of hands. The company are troubled with slow collections, but otherwise the outlook with them is quite satisfactory under the circumstances.

The American Wringer Company's plant at Woonsocket, R. I., which has been running three days a week during the past two months, will probably start in on full time in a few days.

G. W. Denison & Co., Winthrop, Conn., manufacturers of wood planes, are closing out their business.

The Hatch Cutlery Company, South Milwaukee, Wis, and 97 Chambers street, New York, are congratulating themselves on the amount of Christy knives sold since they undertook to market the entire output in July last. They refer to the aggregate number of sets disposed of since that time as 10,000, and assure us they are making an effort to execute orders promptly.

LABOR EXCHANGE.

Notices under this heading of reasonable length are inserted free of charge. Only those relating to employment are admitted. Write distinctly on one side of paper only, and do not use postal cards.

HELP WANTED.

Will I. B. Schneider, who used to work in Toronto, please write to "T. McD.," 10 Inspector street, Montreal, Canada. Oct. 14

At once, a first-class TINSMITH and GENERAL JOBBER for country shop; must be able to do iron pipe and pump work and have knowledge of plumbing and steam fitting; state wages and experience. Jno. N. Remsen, West Grove, Pa. Oct. 14

A first-class STEEL RANGE MAKER; capable of conducting a shop; new business. M. N. Donnelly, Pittston, Pa. Oct 14

A first-class TIN and SHEET IRON WORKER; no half plumber and half tinsmith, but a genuine, first-class tinsmith; wages, $3 per day steady the year round. "Steady," office of *The Metal Worker*, 96-102 Reade street, New York City. Oct. 14

Six experienced MOUNTERS wanted in a stove foundry. Ohio Stove Company, Portsmouth, Ohio. Oct. 7

TRAVELING SALESMEN to sell specialty in sheet metal as side line; good commission. "R. W. B.," office of *The Metal Worker*, 220 South Fourth street, Philadelphia. Oct. 7

A STOVE SALESMAN, thoroughly acquainted with the trade of New York City and Brooklyn, to represent a large manufacturing house. Apply, stating former employers and references. "A. B.," office of *The Metal Worker*, 96-102 Reade street, New York City. Oct. 7

FIVE SHEET METAL AND SKYLIGHT MAKERS. Apply to James F. Dean, 38-40 North street, Salem, Mass. Oct. 7

SITUATIONS WANTED.

By a TINNER, SHEET IRON WORKER and ROOFER, used to jobbing, inside and outside. B. Simon, 303 Eldridge street, New York. Oct. 14

In a shop by a general workman as PLUMBER and STEAM and HOT WATER FITTER; some knowledge of tinning; 23 years of age; five years' experience; strictly temperate and steady. "S.," Box 81, Dobbs Ferry, N. Y. Oct. 14

As TRAVELING SALESMAN for manufacturer of steam supplies or specialties; ten years' experience; best of references. "J. W. B.," P. O. Box 744, Philadelphia, Pa. Oct. 14

As SHIPPING CLERK with some good house in Baltimore, Md.; old railroad man, and knows all points in the South; can give best of reference. "H. L. D.," 111 York street, Savannah, Ga. Oct. 14

A young man of 19 would like to finish plumbing trade or work under instructions; four years' experience. W. Wadden, 36 Main street, Marlboro, Mass. Oct. 14

By a good PLUMBER; can read plans; would like a steady position; married; can furnish references; would work on shares—West, South or East; steady and reliable. "R. B. C.," care John Flynn, 331 West 117th street, New York City. Oct. 14

As TINSMITH, SHEET IRON WORKER and ROOFER; can also do stove, range and furnace work; some knowledge of plumbing and gas fitting. Herman Gold, 19 Chrystie street, New York. Oct. 14

Young man, 22, in business in New York, desires employment evenings; good draftsman and rapid writer. "Rapid," office of *The Metal Worker*, 96-102 Reade street, New York City. Oct. 14

A No. 1 PLUMBER, STEAM and HOT WATER FITTER of long experience, thoroughly posted on plans, specifications and estimating; by the year or percentage; best of references. J. A. Bolton, Syracuse, N. Y. Oct. 14

By a young man who has had a course of plumbing in the New York Trade School and is a good workman in lead and can do lead burning and has a machine; good reference. R. S. Sholes, Jr., Norwich, Conn. Oct. 14

Young man, age 17, would like to get a place in plumbing shop, where he could obtain a knowledge of the trade. Charles Laird, 186 Tenth street, Brooklyn, N. Y. Oct. 14

By a STEEL RANGE MAKER of 15 years' experience; can act as SALESMAN. "Range Maker," 103 Ross street, Pittsburgh, Pa. Oct. 14

By an experienced TINSMITH, capable of doing roofing, furnace, heating and range work and general jobbing. Fritz Freeman, 408 Grand street, Hoboken, N. J. Oct. 14

By a TIN and SHEET IRON WORKER and ROOFER. B. Gorden, care Jas. Sheer, 43 Henry street, New York. Oct. 14

First-class TINSMITH, thoroughly competent in the different branches, including plumbing, wishes a steady position at fair wages in Central New York, in shop with fair tools and light. "Steady," Box 202, Fulton, N. Y. Oct. 14

By a young man 26 years of age with 12 years' experience at TIN and SHEET-IRON WORK and ROOFING; furnace work a specialty; can do all kinds of general jobbing. J. Fink, 604 East Ninth street, New York City. Oct. 14

Steady job by a first-class PLUMBER, with a fair knowledge of tin and sheet iron work, roofing and pump work; city or country. "Plumber," Box 266, Hyannis, Mass. Oct. 14

As CORNICE CUTTER, by a practical mechanic of 20 years' experience; situation desired in a good cornice shop. L. W. Cutter, 488 Winchester avenue, Chicago, Ill. Oct. 14

As PLUMBER, TINNER and GENERAL JOBBER in any shop in New England; 12 years' experience; wages $3 a day. G. H. O'Neill, Box 315, East Brookfield, Mass. Oct. 14

By a good TIN and SHEET IRON WORKER; city preferred. "J. J.," care S. Greenwald, 4 Lewis street, New York. Oct 14

By an all around TINSMITH, who would like to work in some large country village. "C. R. T.," Hyannis, Mass. Oct. 14

As SALESMAN with some good stove or crockery house in Baltimore, Md., by a sober man and good salesman; have 15 years' experience in stoves and five years in crockery; can give best of reference. "S. A. C.," 111 York street, Savannah, Ga. Oct. 14

By a young TINSMITH with eight years' experience in country shops; can repair and put up any kind of pump and do jobbing at plumbing; steady situation desired. "F. M.," Box 75, Manhasset, L. I. Oct. 14

By a TINNER with 12 years' experience at roofing, guttering and general jobbing; young man; sober. Box 207, Harrodsburg, Ky. Oct. 7

An experienced man desires position as SUPERINTENDENT of stove foundry; first-class reference given. "Stove Foundry," Box 107, office of *The Metal Worker*, 96-102 Reade street, New York City. Oct. 7

A practical STEAM and HOT WATER FITTER, capable of estimating and constructing work, desires to represent in Philadelphia and vicinity some party or manufacturer of heating specialties, or would take the agency for, and push the sale of, some special goods of merit in the heating or plumbing line, on commission or salary; reference and security if necessary. "W. C.," office of *The Metal Worker*, 220 South Fourth street, Philadelphia, Pa. Oct. 7

By a WOOD and METAL PATTERN MAKER who is also a molder by trade, and a first-class wood turner; can do a fair job at tinning; worked for Seymour & McIntosh until they shut down; best of references. Madison Vorce, 15 Wood street, Auburn, N. Y. Oct. 7

By a METAL PATTERN MAKER who can file, fit and ornament stoves, originate patterns or repair same. "J. P.," 11 Delevan street, Auburn, N. Y. Oct. 7

By a TINNER, with 11 years' experience at all kinds of inside and outside work, tinware and piping; steady job desired with some good hardware house; small city preferred. "Tinner," 113 E. Second street, Pine Bluff, Ark. Oct. 7

By a STOVE PATTERN MAKER who has had 15 years' experience; can give good reference. C. W. Williams, 225 Warren street, Pittston, Pa. Oct. 7

A first-class plumber, gas, steam and hot-water fitter wants a position of trust as FOREMAN of shop; is thoroughly reliable, estimating from plans and specifications; close figurer; is a practical mechanic, and capable of handling small or large jobs; 22 years' experience; understands testing soil pipe and first-class work; has passed examination of plumbers in New York City and Brooklyn, N. Y.; first-class references given if required. "On the Square," office of *The Metal Worker*, 96-102 Reade street, New York City. Oct. 7

Man of practical and commercial experience in hardware, cutlery, notions and electrical work desires engagement in a responsible position; highest references. Box 2268, General Post Office, New York City. Oct. 7

Steady position with some good firm by a young man 25 years of age, as TIN and SHEET IRON WORKER; can also do warm air furnace work and slate roofing; 11 years' experience; steady, sober and industrious; can furnish best of references. "Tin and Sheet Iron Worker," L. Box 536, Cincinnati, Ohio. Oct. 7

In a good shop, by a boy 16 years of age, to learn the plumbing trade. "A. J. C.," P. O. Box 363, Haverstraw, N. Y. Oct. 7

Steady job wanted by a first-class PLUMBER; willing to go to any part of the United States; seven years' experience. J. Godsill, 1221 Third avenue, New York. Oct. 7

PLUMBER and GAS FITTER wishes employment in or near New York City; ten years' experience; sober, reliable and can furnish reference if required. "W. W. H.," 1910 Congress street, Louisville, Ky. Oct. 7

By an experienced STOVE PATTERN MAKER and CARVER of 12 years' practice at stove foundry; am a thorough mechanical and ornamental draftsman and designer on stove work in the latest styles. "Experience," office of *The Metal Worker*, 96-102 Reade street, New York City. Oct. 7

By competent cornice maker, as CUTTER or FOREMAN; looks for steady employment; best of references. "L. M.," 101, office of *The Metal Worker*, 59 Dearborn street, Chicago, Ill. Oct. 7

By a practical SHEET IRON WORKER, who can work from plans and lay out and cut out all kinds of work; capable to have charge of shop. "Capable," office of *The Metal Worker*, 96-102 Reade street, New York City. Oct. 7

A young married man, 26 years of age, in the hardware, stove and tinware business, wholesale and retail, wishes to better his position; is also conversant with the details of bookkeeping; best of references. Joseph Birbeck, Post Office box 157, Freeland, Pa. Sept. 30

As BOOKKEEPER; has had experience in wholesale and retail plumbers' and mill supplies; can give reference. F. H. Carter, 275 South Factory street, Springfield, Ohio. Sept. 30

Cornice cutter of 12 years' experience desires a position as CUTTER or FOREMAN by October 15; thoroughly understands the business in all its branches; the West preferred; can furnish the best of references. "A. B. C.," office of *The Metal Worker*, 59 Dearborn street, Chicago, Ill. Sept. 30

An experienced hardware SALESMAN wishes a position with some good firm, either in store or on the road; capable of taking full charge of a store; can give best of references. Box 53, Middletown, Ohio. Sept. 30

By a thoroughly first-class PLUMBER, a steady position in or near New York; 15 years' experience; can take charge and do a little tin work if necessary; state wages. "A. W.," care Mitchell Bros., 438 Grove street, Jersey City, N. J. Sept. 30

As TINNER on furnace and job work. "Tinner," P. O. Box 169, Cochranton, Pa. Sept. 30

By a young TINSMITH, 24 years old; competent to do any work in this branch. L. Kreurmann, 199 Forsyth street, New York City. Sept. 30

By a japanner, as FOREMAN with a first-class house in the West; understands all the branches of the business and can instruct boys and girls. "Japanner," office of *The Metal Worker*, 96-102 Reade street, New York City. Sept. 30

By a young man, as TINSMITH; 18 years' old; three months in this country. Mr. Schapiro, 217 Madison street, New York City. Sept. 30

Experienced STEAM FITTER, well acquainted with the latest system of burning oil under boilers and heaters. C. F. Pluemacher, 455 Ninth avenue, New York City. Sept. 30

WOOD PATTERN MAKER and CARVER in stove works; competent to make drawings, both ornamental and mechanical. J. Thomas, 10 Broadway, two flights, front, Troy, N. Y. Sept. 30

By a PLUMBER who thoroughly understands plumbing and gas fitting, also has some knowledge of steam fitting; steady position desired for the fall and winter in some Southern town or city; has worked in city and country; temperate. F. J. Wolfel, care B. D Lum & Son, Stamford, Conn. Sept. 30

By a TINNER of six years' experience at furnace work, roofing, spouting and jobbing; am strictly temperate and reliable; steady job wanted in town or country; state wages. "A. B.," Box 83, Woodstock, Ontario. Sept. 30

By an A1 pattern fitter and stove mounter, as FOREMAN or to work at the bench; position desired by January 1, 1894. Frederick Kent, 1188 Congress street, Detroit, Mich. Sept. 30

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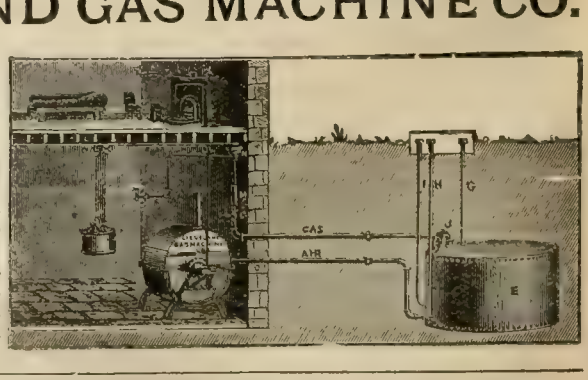

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THE METAL WORKER.

NEW YORK AND CHICAGO.

Saturday, October 21, 1893.

DAVID WILLIAMS, - PUBLISHER

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Foresight Better Than Hindsight.

It is encouraging to perceive in current discussions of the subject of ventilation an emphatic demand for the preparation of plans for ventilation and heating prior to the commencement of the construction of buildings. It has been shown that a large part of the expense often attending the securing of good and sufficient ventilation is due to want of consideration of this question at the proper time; that is to say, at the time the rudimentary scheme of a building is being worked out. The chosen system of means and appliances for heating and ventilation should always be decided upon, incorporated in and form part of the perfected general plans. When this is done, the cost of a sufficient supply, as compared with a largely deficient one, will not be so great as many have been led to suppose.

General Application.

The force of the above remarks equally applies to plans for heating apparatus for dwellings and other buildings wherein no special system of ventilation, other than afforded by grates, &c., is intended. The whole category of extra charges that so frequently come in with bills for heating work is properly to be laid at the door of architects who neglect to consider the requirements for heating in drawing their plans; or who, if they do consider the matter, do so without such a practical knowledge of the heating business as enables them to properly plan a heating apparatus, and without the always easily obtained aid of a competent adviser. There is no good reason assignable why a building should not be designed with full reference to its being properly heated and ventilated any more than that windows should be omitted from plans and left to be put in by the builder, during construction, according to his own judgment. But this is exactly what is done, in the majority of cases, with heating apparatus for dwellings. The building is first planned, and, as a general thing, almost completed before the heating engineer is called for consultation and requested to make plans upon hard and fast lines necessitated by the architect's plans; and when some utter impracticability is encountered an alteration, attended with extra cost, is the result. Such was recently the case in the heating of a large dry goods store, in which a workroom that required to be heated was found inaccessible for the purpose except by an objectionable position of risers, where they would be not only in the way of incoming customers, but greatly mar the effect of the desired display of goods. To remove this impracticability an extra cost of about $500 was entailed. To have avoided the introduction of such an impracticability under the advice of a competent heating engineer and to have secured a better job of heating work than was ever possible under the obstacles introduced would not have cost over $50.

New York Trade School.

The thirteenth annual session of the New York Trade School, to which reference was made in our last week's issue, was inaugurated on Monday evening, October 16. The evening classes in plumbing, bricklaying carpentry, house and fresco painting, blacksmithing and stone cutting on that day commenced their respective courses of instruction, the number in each department being as follows: Plumbing, 115; bricklaying, 32; carpentry, 41; house painting, 15; fresco painting, 17; blacksmithing, 21; and stone cutting, 4. The evening class in plastering will not begin work until December 11. This attendance is fully up to the average of recent years and speaks well for the sustained popularity of the school, which has now attained to such prominence as to be the model for similar institutions throughout the country. The present season of work opens under the shadow of a great loss which has fallen upon the institution since the classes were last in active session. The honored founder and active manager of the school has been removed by death, and his wise and invaluable personal influence and efforts are no longer at its service. Happily Colonel Auchmuty left his cherished enterprise on so firm a basis, and its machinery in such a complete state of efficiency, that it is not likely to languish now, even though his guiding hand has been removed. Colonel Auchmuty's co-workers in the school have been thoroughly imbued with his enthusiasm in the work and with the ideas formulated in the now celebrated "Auchmuty system," under which it is conducted; and they will undoubtedly be competent to carry on the good work successfully on the old lines. Our best wishes go with the New York Trade School in its new year of existence.

The Closing Month of the Fair.

The World's Fair is winding up its career in a blaze of glory. As Chicago suprised the world with the grandeur of its exposition buildings, and as the magnificence of the display in its entirety far surpassed anything previously accomplished in the same line, so has the attendance outrun all expectations, and in that respect another phenomenal triumph has been scored. High water mark was struck on the 9th inst., "Chicago Day," when the total attendance reached 761,942 including those admitted on passes, or 716,881 paid admissions. Several days in the same week the paid attandance ran above 250,000 and on two days it was over 300,000. The total paid attendance for the week, including Sunday, the 8th, was 2,131,719. This far outnumbers the attendance in any similar period at any previous international or any other kind of exposition, or, in fact, any other kind of gathering of which there is any authentic record. A figure is thus set for the future that will be very difficult to exceed, and it is safe to say that for years to come any very great gathering of people will be compared with this stupendous occurrence in Chicago on the 9th of October, 1893.

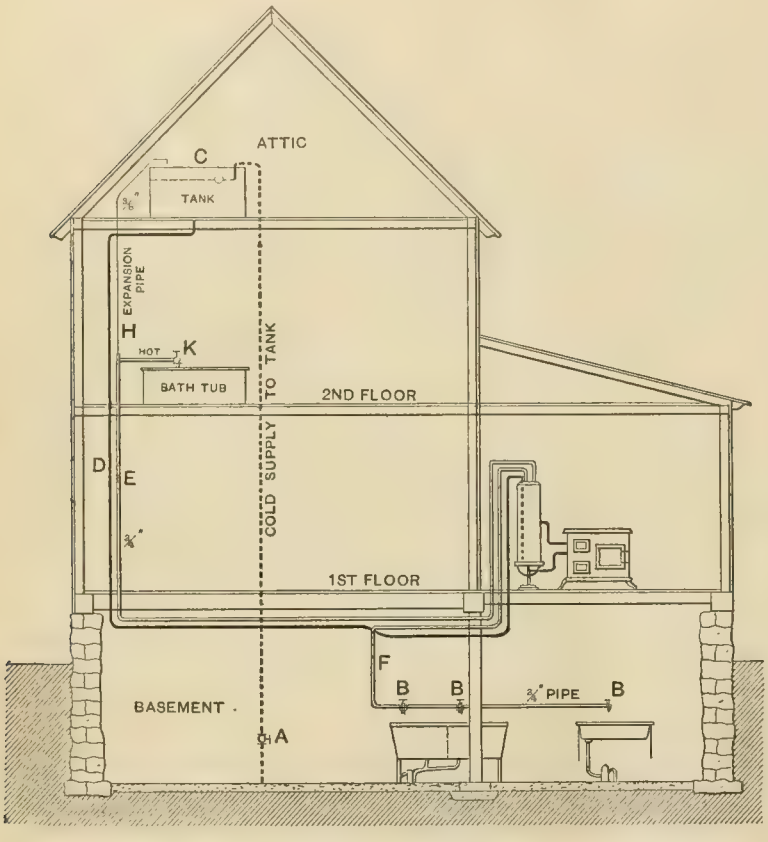
Chicago's Boast.

The attendance at the exposition for the week is another most notable matter. The figures are staggering. But Chicago boasts not alone of this achievement in attendance. To the surprise of many shrewd business men, who had not looked for such success, the exposition managers signalized Chicago Day by paying off the floating debt and the mortgage on the gate receipts, thus leaving the enterprise free of all obligations to any persons but the stockholders, who may now reasonably expect a dividend in due season. The check drawn on this memorable occasion for the payment of the trustee of the several classes of creditors called for $1,565,310.76. Thus has Chicago gloriously redeemed the obligations incurred when she assumed the task of building a World's Fair. Chicago's business men started out to prepare for a finer, bigger and more successful enterprise than the world had ever seen in this line. The verdict of the jury of the nations of the earth who have seen it is that it is unquestionably bigger and undoubtedly finer, and now it is assuredly more successful. Great is Chicago, and we are prouder than ever of her.

THE LETTER BOX.

To Prevent Collapse of Boiler.

From T. L., *Natick, Mass.*—Will *The Metal Worker* please give me information as to the result of the conditions shown by the sketch? Cold water supply at A cut off, all the bibbs in the bathroom K closed, and the bibbs B B B on the hot water pipe in the laundry open. From the top of the hot water pipe in the bathroom a ⅜-inch pipe is carried to the supply tank. Will the supply of air through the ⅜-inch expansion pipe be sufficient to prevent a partial collapse of the boiler?



To Prevent Collapse of Boiler.

Note.—It is possible that a ⅜ inch pipe would prevent the boiler from collapsing, but a safer practice is to use a larger size. A ½-inch pipe is used by many experienced plumbers, though some observe a rule of making this pipe the full size of the pipe which leads from the boiler, and others use a vacuum valve at the top of boiler.

School of Pattern Cutting.

From F. D., *New York.*—Please inform me, through *The Metal Worker*, if there is a school in New York City where pattern cutting for cornices and skylights is taught. It is not taught in any of the public schools nor in Cooper Union.

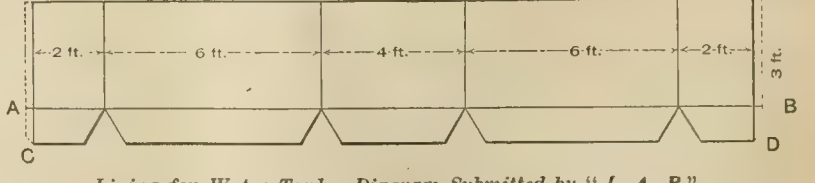
Note.—We do not know of any place in New York City, or elsewhere, for that matter, where instruction can be obtained in pattern cutting, outside of the shops devoted to that sort of work. If there is such a school in New York City, or any other place in the country, we shall be glad to know of it.

Bending Iron Pipe.

From J. HAWK, *Nevada.*—Will some of the practical contributors to the Letter Box tell a backwoods tinner and all around workman how to bend wrought iron pipe into a coil to be used in a hot air furnace for heating water?

Lining for Water Tank.

From J. A. B., *Riverhead, L. I.*—In answer to H. and S., Marietta, Ohio, who wish information regarding the material and method to be used in lining a 60-barrel water tank, I would advise the use of 16-ounce tinned copper, for the reason that it is easier to place in the tank than sheet lead; besides, it will not injure the water. I am informed that the boards of health in some of the large cities require all water tanks to be lined with tinned copper, as sometimes the water is used for cooking and drinking purposes and is not injured by coming in contact with the tinned metal. I have lined about 20 tanks with tinned copper, some of which have stood nearly 14 years, and never had a leaky tank. Other tanks, lined with sheet lead and put in by tinners, have failed because the tinners could not solder the upright seams with a soldering iron strong enough to stand the water pressure. Suppose a tank 6 feet long, 4 feet wide and 3 feet high is to be lined with tinned copper. First get out the sides and ends in one piece, as shown in the accompanying diagram. The sheets of copper would be locked together and the seams well soldered. Below the line A B allow for bending in, which makes it easier for joining the bottom. Also allow for end seam, as shown by the dotted lines. Form the lining as indicated by the solid lines, place in tank, and finish the end seam. When soldering the upright end seam use very small bars of solder, which are light to handle and melt easy at the point of the soldering iron. After the lining is in position, turn over the edges from C to D, so a locked joint can be made with bottom piece, which is also to have its edges turned over. The seams thus formed are to be pounded down and well soldered. For securing lining to tank use copper nails, as iron nails are liable to corrode and cause leaks.



Lining for Water Tank.—Diagram Submitted by "J. A. B."

Water Back and Boiler Connection.

From F. M. P., *Washington, N. J.*—I would like to say to "G. E. M." of New Hampshire, whose letter appears in *The Metal Worker* of October 14, that I fear he will have to resort to heroic treatment. Two remedies suggest themselves to me: One is to put the boiler upstairs, in a closet if convenient, over the range, and the other is to change the range for one with the boiler resting horizontally on a high shelf. If he overcomes the difficulty he should report to the Letter Box for the benefit of other readers of the paper.

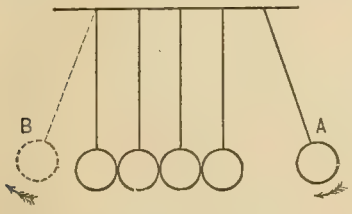
Connecting Bathroom Radiator With Water Back.

From INQUIRER, *New Jersey.*—Will the practical readers of *The Metal Worker* please tell me which is the better place to connect the pipes from a radiator in a bathroom to the kitchen apparatus? Should the pipes be joined by means of a Y branch with the pipes between the boiler and the water back, or should the flow pipe to the radiator con-

nect with the hot water service pipe at the top of the boiler? I favor the top of the boiler and think that, as a rule, better circulation would follow and the boiler would not be likely to be robbed of hot water by suspended or sluggish circulation, which would be possible if the flow pipe connected with the branch on the hot water pipe from the water back.

Riveting Hammers.

From B. S., *Boston, Mass.*—Let a number of balls be suspended as shown in Fig. 1, and one of the balls, as A,



Riveting Hammers.—Fig. 1.—Effect of Light Hammer.

lifted and allowed to strike the row. One ball, as B, will be made to swing off on the other side, regardless of the velocity with which the first ball strikes the others. If two balls, as C and D, are allowed to fall against the three, as shown in Fig. 2, then two balls, as E and F, will be thrown off on the other side, and as in the previous instance, regardless of the velocity with which the two balls struck.

Let us suppose the balls in line represent the atoms of a body, and the striking balls to be hammers of different weight. The heavy hammer, as illustrated in Fig. 2, can be said to transfer its force into the interior of the object struck, while the light hammer, as illustrated in Fig. 1, does not put so much of the material in motion. When riveting with a heavy hammer, we may infer that the rivet would be made to expand, and thus fill in the recesses of the rivet hole, besides forming the usual head on the hammered end. The lighter

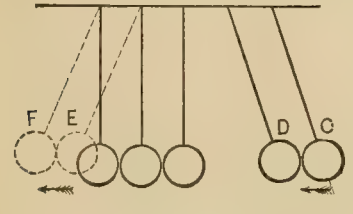


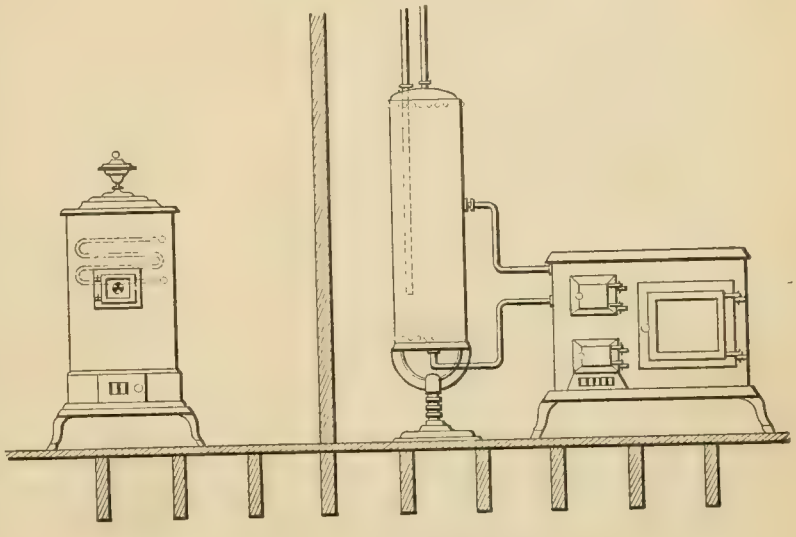
Fig. 2.—Effect of Heavy Hammer.

hammer being used, as indicated in Fig. 1, it would simply form a head on the hammered end of the rivet without expanding its body to any great extent.

Note.—Our correspondent has given a very interesting illustration, but we are by no means sure that his reasoning is correct, although his results are plausible. He seems to think that the force of a blow depends upon the weight of the hammer. As a matter of fact, the force of a blow is dependent upon two things, the weight of a striking body and the velocity with which it moves. A 1-pound hammer when striking with the velocity of 2 feet a second delivers the same blow as a 2-pound hammer when striking with a velocity of 1 foot a second. When it comes to the matter of riveting there is another curious fact that must be considered. A light hammer striking with high velocity will give, as we have pointed out, just as heavy a blow as the heavy hammer that is swung more slowly. The effect of the latter, however, would be more likely to fill up the rivet holes our correspondent mentions, as it would give more time for the rivet metal to "flow," as the term is.

Boiler Connected with Two Stoves.

From B. & S., *Franklin, N. Y.*—Will *The Metal Worker* give the best method of doing the work suggested by the accompanying sketch? It represents a 40-gallon boiler connected with a range in a farm house kitchen, which has been in satisfactory operation one year. In an adjoining room, separated by a partition, is a heating stove in



Boiler Connected with Two Stoves.

which a coil is to be placed and properly connected with the boiler. The object is to secure a supply of hot water from the heating stove when the range is not in use. There is about 20 pounds pressure and I wish to ask if it would be advisable to run a supply pipe under the floor to a heating coil in the stove? How many elbows or return bends should be used in the coil?

Note.—A branch from the cold water pipe at the bottom of the boiler should be run under the floor to the coil in the stove. A pipe taking the hot water from the coil in the stove should run up to the ceiling and then through the partition, where an air cock should be placed, and be connected with the hot water service pipe from the top of the boiler. Some may prefer a more direct connection with the boiler, even by running down and connecting with the return from the water back; but either way will answer. A condition that may be troublesome will arise when there is a good fire in both stoves, which may heat the water more than is desirable. The size of the coil in the stove and the number of elbows or returns to use is difficult to decide without knowing the size of the stove and how much of the time its door is left open to check the draft. However, to give something that our correspondent can use as a basis from which to make a decision according to his own judgment, with all the conditions before him, a coil of 1-inch pipe running once around inside of a 14 inch cylinder stove and located just above the top of the fire would do the work. Such a coil would not interfere with adding fuel, and if the door of the stove was opened the inflow of cold air would not strike directly against it. If a coil is used, as shown in the illustration, more surface should be exposed in it to do the work, possibly one-third more.

Check Valves and Steam Heaters.

From H. W. W.—In reply to "Inquirer," in the issue of *The Metal Worker* of October 14, I would say that where two boilers or more are working together, check valves must be used to prevent the water from backing out of one into the other, as the steam capacities of both boilers are not at all times equal. This is owing to the covering of the fire with green coal, &c. Where one boiler is used checks are seldom put in, and this, I think, is a mistake, as many boiler tubes and sheets have been burned and destroyed simply because there was no check in the return to prevent the pressure from backing the water out of the boiler. I maintain that every heating apparatus should have checks in the return. The horizontal swinging check valve will not obstruct or offer any more resistance than an ordinary right angled bend when properly adjusted. They are as important and reliable a fixture as any connected with a steam heating outfit. It has happened where a steam pipe burst that the attendant shut off the steam valves first, which had the effect of lowering the water level about 12 inches below the top row of tubes, and this with a brisk fire going. If there had been a check valve used it would have saved a great deal of trouble and expense. I believe in the check valve for every heating apparatus, particularly where they are handled by careless or indifferent employees.

THE TIN SHOP.

Pattern for an Elliptical Flaring Article.

From W. S. C., *Tallahassee, Fla.*—would like to be informed how to describe the patterns for an elliptical flaring article, similar to a foot bath.

From W. F. S., *Bayfield, Wis.*—Will *The Metal Worker* publish a simple method of describing the patterns for an oval flaring pan, the body to be in two pieces?

Answer.—The first step to be taken in describing the patterns for the articles mentioned above is to obtain the shape of an approximate ellipse, or one struck from two sets of centers, which can be done as follows: In Fig. 1, let B C represent the length of the ellipse, and D E the width. Draw B C and D E at right angles to each other, intersecting at A. Take the width D E and set off from C on C B, as shown at F. Divide F B into three equal parts, as indicated by the small figures. Then take two of these parts, as B 2, and, with A as center, establish the points H and G on B C. With H G as radius, and G as center, strike an arc indefinitely, as shown by J K H, and in a similar manner, with H as center, describe the arc K G J. From K draw lines through the points H and G indefinitely, as shown by K N and K O.

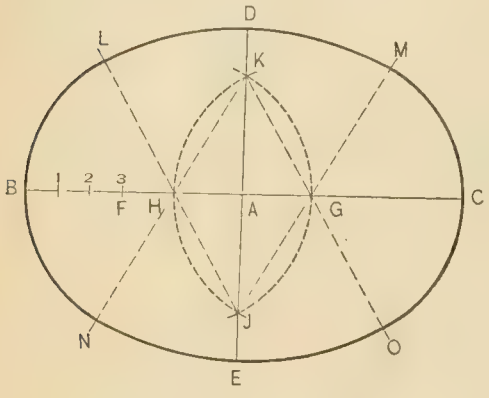


Fig. 1.—Method of Describing an Ellipse.

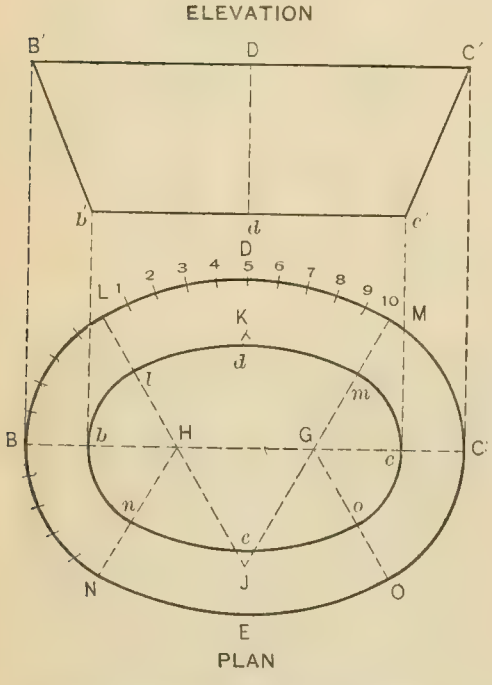


Fig. 2.—Plan and Elevation of Article.

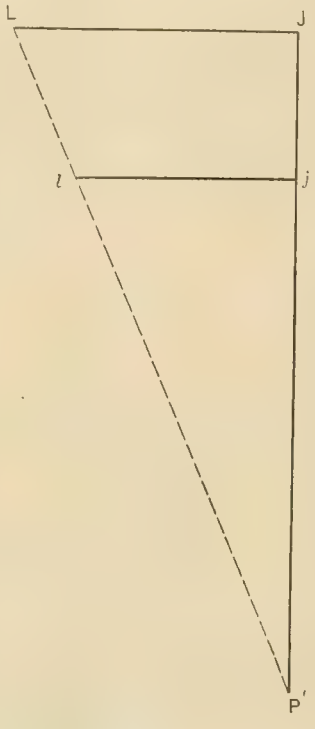


Fig. 3.—Method of Obtaining Radii for Sides.

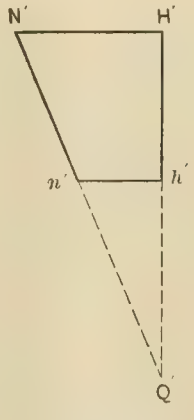


Fig. 4.—Method of Obtaining Radii for Ends.

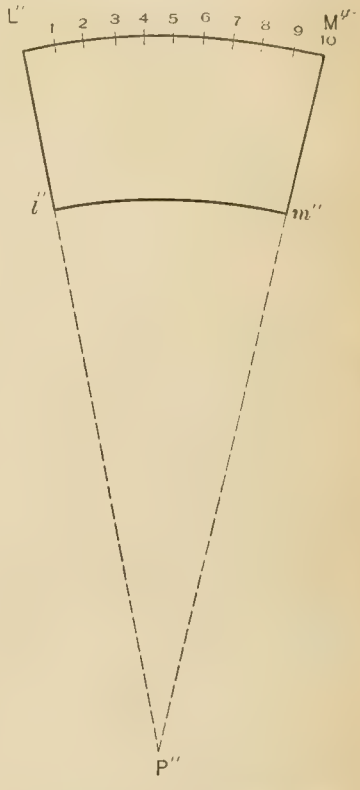


Fig. 5.—Pattern for One of the Sides.

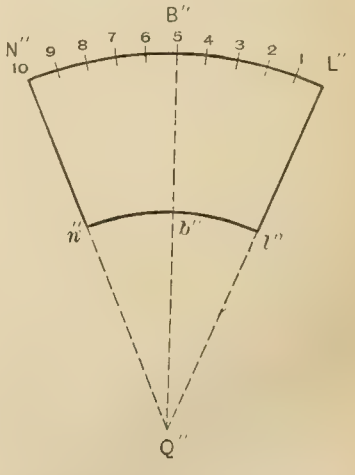


Fig. 6.—Pattern for One of the Ends.

Lines are to be drawn in a similar manner from J through points H and G, as shown by J L, J M. With J D as radius, and J as center, strike the arc L D M, and with K as center, and K E as radius, strike the arc N E O, thus forming the sides of the figure. With H as center, and H B as radius, strike the arc N B L. With G as center, and G C as radius, strike the arc M C O, which completes the figure, a duplicate of which is shown in Fig. 2. Supposing this figure, as shown by B D C E, to represent the top of the article, the next step will be to draw the elevation of the article corresponding to and in line with the plan, making the hight D′ *d*′ and length of bottom *b*′ *c*′, as may be desired. Place the T-square at right angles to B C and bring the blade against point *b*′ and drop a line cutting B C at *b*. In a similar manner drop a line from *c*′ to *c*. Then *b c* gives the length of bottom of article on plan. With H as center, and H *b* as radius, strike the arc *n b l*, cutting H N and H L, as shown. Also, with G as center, and G *c* as radius, strike the arc *m c o*, cutting G M and G O. With J as center, and J *l* as radius, strike the arc *l d m*. In a like manner, with K as center, and K *e* as radius, strike the arc *n e o*.

Then in Fig. 2, B′ C′ *c*′ *b*′ represents the elevation of article, B D C E the plan of top, and *b d c e* the plan of bottom. If so desired the elevation could be first drawn, giving the length of top, bottom and hight of the article, after which the plan could be drawn, as shown. While the elevation is necessary to show the shape of article it is not required in obtaining the patterns, providing the hight of article is known. The next step is to construct the diagram shown in Fig. 3 for obtaining the radii of sides. Draw the perpendicular line J′ P′ indefinitely, and at right angles to it draw J′ L′ indefinitely. Make J′ L′ equal to J L of the plan. From J′ on J′ P′ set off the vertical hight of the article, as shown by D′ *d*′ of elevation. Draw *j*′ *l*′ parallel to J′ L, and from *j*′ set off the distance J *l*′ of plan. Having established the points L′ and *l*′, draw the line L′ *l*′, which continue until it intersects J′ P′ at P′. Then P′ L′ will be the radius for describing that part of the pattern indicated on plan by L D M, as P′ *l*′ will be the radius for describing the part of pattern indicated by *l d m* of plan. The diagram in Fig. 4, representing method of obtaining radii for ends, is obtained in a similar manner. Draw the right angle N′ H′ Q′, and from H′ set off the distance H N of plan. Make H′ *h*′ equal to the vertical hight of article, as shown by D′ *d*′ of elevation. Draw *h*′ *n*′ parallel with H′ N′, and from *h* set off the distance H *n* of plan. Through the points N′ *n*′ draw N′ Q′, as shown. Then Q′ N′ will be the radius for describing N B L of plan, and Q′ *n*′ for describing *n b l* of plan.

We are now ready to describe the pattern of one of the sides, to do which proceed as follows: In Fig. 5 draw any line, as L″ P″. With L′ P′ of Fig. 3 as radius, and point P″ of Fig. 5 as center, strike the arc L″ M″. With the same center, and with P′ *l*′ of Fig. 3 as radius, strike the arc *l*″ *m*″. Make L″ M″ of Fig. 5 equal to L D M of plan, either by measuring with a strap or by dividing into equal parts, as shown by the small figures. From the point M″ draw a line to P″, as shown. Then L″ M″ *m*″ *l*″ is the pattern for part of article shown on plan by L D M *m d l*.

For pattern of end piece, which includes the part of plan between N and L, draw the line L″ Q″ of Fig. 6 indefinitely. With Q″ as center, and Q′ N′ of Fig. 4 as radius, strike the arc L″ N″, making it in length equal to N B L of the plan. With Q″ as center, and Q′ *n*′ of Fig. 4 as radius, strike the arb *l*″ *b*″ *n*″. From the point N″ draw a line to Q″. Then N″ B″ L″ *l*″ *b*″ *n*″ is the pattern for that part of article shown on plan by N B L *l b n*. To construct the article shown in Fig. 2 two side pieces and two end pieces similar to Figs. 5 and 6 are required. As the net patterns only are shown, allowance is to be made for joining, burr and wire. If it is desired to have the article made from two pieces, so the seams will be at the ends, as indicated by B *b* C *c* in plan, describe the pattern as shown in Fig. 7. In this figure L‴ M‴ P‴ is a duplicate of Fig. 5, and is drawn as previously described. It is then only necessary to draw the half of pattern of end, Fig. 6, on each side, as shown. This can be done as follows: From the points L‴ and M‴, in the direction of P‴, set off the distance N′ Q′ of Fig. 4, thus locating points X and Y. From X as center, describe the arcs L‴ B‴ and *l*‴ *b*‴, using the radii X L‴ and X *l*‴, or Q′ N′ and Q *n*′ of Fig. 4. Make L‴ B‴ of pattern equal to L B of plan, and from B‴ draw a line to X. In a similar manner describe the arcs M‴ C‴ and *m*‴ *c*‴ from the center Y, using the same radii as in the previous instance. Make M‴ C‴ equal to L‴ B‴ and draw C‴ Y, which completes the half pattern. As the net pattern only is shown, the usual allowances are to be made for joining, burr and wire.

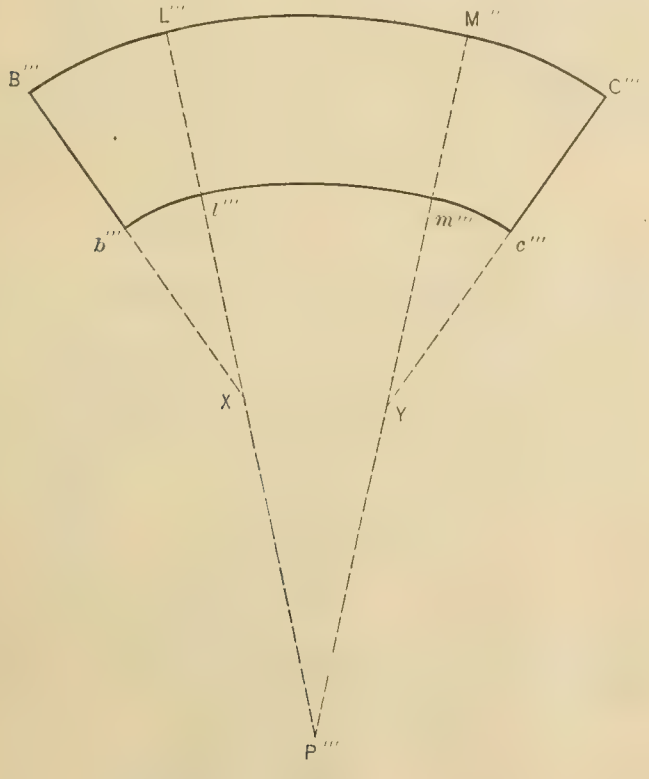


Fig. 7.—Pattern for One-Half of the Article.—Seams on the Ends.

PATTERN FOR AN ELLIPTICAL FLARING ARTICLE.

The fire loss of the United States and Canada during September amounted to no less than $10,508,700, which, although a decrease of $2,714,000 from that of August, still shows a serious increase, amounting to $2 628,900, over the loss of September, 1892. The total value of property destroyed by fire for the first nine months of the present year now reaches the enormous figures of $120,832,700, or over 25 per cent. greater in the aggregate than those of the same period in 1892.

Prof. Sylvanus Thompson of London believes that ocean telephony is not only possible, but that it will be among the developments of the near future.

Among those who will lecture before the Franklin Institute of Philadelphia during the coming season will be Henry R. Towne of Stamford, Conn., who will speak, on January 26, on "American Bank Locks and Fastenings."

ROOFING AND CORNICE.

Some Western Methods of Cornice Work.

BY C. H. ARGO.

In this article we will endeavor to illustrate some of the simplest points about galvanized iron cornice constructions as practiced in the West, and show, perhaps, where some time may be saved by describing the different steps to be taken, from the time the drawing is received from the architect to the setting of the cornice on the building ready for the mason to back up.

We have chosen for this purpose a plain, ordinary main cornice, with a head block on each end, as shown by Fig. 1. The first thing to do is to make a full size detail, if none be furnished, and place it on the drawing table in the lower left hand corner, so as to facilitate the drawing of the horizontal lines. About the first pattern cut on a cornice of this kind is the bracket side, which is marked (with muriatic acid in which some copper filings have been dissolved) with the number required, the 7 *m* in Fig. 3, meaning seven more, which, with the pattern, makes eight sides, the number required for four brackets, as called for in the elevations. The scroll in the side is a single cut of the snips. It will be observed that in addition to the ⅞-inch lap allowed to turn out for riveting purposes, we have two pair of prick marks on the outside edge, the use of which will be explained further on. We next take, with a strip of thin metal, the stretchout of the top part of the bracket face, from the top of the sink at A, Fig. 2, upward, allowing a ⅞-inch lap to turn out, to which the crown mold will be fastened. Transfer this stretchout to a piece of iron the width the brackets are to be, and mark it as before described 3 *m*, which will be four with the pattern, the number required. We should here state that it is usual to use up the patterns, as it would be found a costly system to keep the patterns for all the cornices made, in this age of keen competition and variety of designs. The stretchout of the foot of the bracket is next taken from the point B downward, turning out ¼ inch on the wash of foot mold.

It is these little details of construction which count in putting the work together, the getting enough laps and edges to make a good job without getting in anything of the kind that will impede the putting together of the work. We next draw a half section of the face, as shown by C, Fig. 2, giving the depth of sink and width of strips on each side of it, the middle strips or back of sink being cut to the exact length called for on dotted lines, but ⅛ inch wider, for convenience in putting together. Now take the pattern of the side and laying it on a piece of iron scribe along its curved edge from one pair of prick marks to the other and put the marks in. Cut out along this line, then with a gauge made of sheet iron the depth of sink, as shown at G, Fig. 3, mark off the pattern and cut off ends through prick marks, which gives the right length. There are no edges or laps on these strips, the different pieces being soldered together sharp.

The head block will be treated in the same way, only the pattern for the side

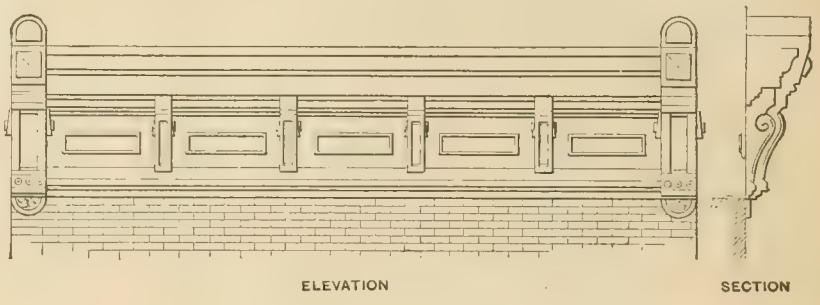


Fig. 1.—Example of an Ordinary Cornice.

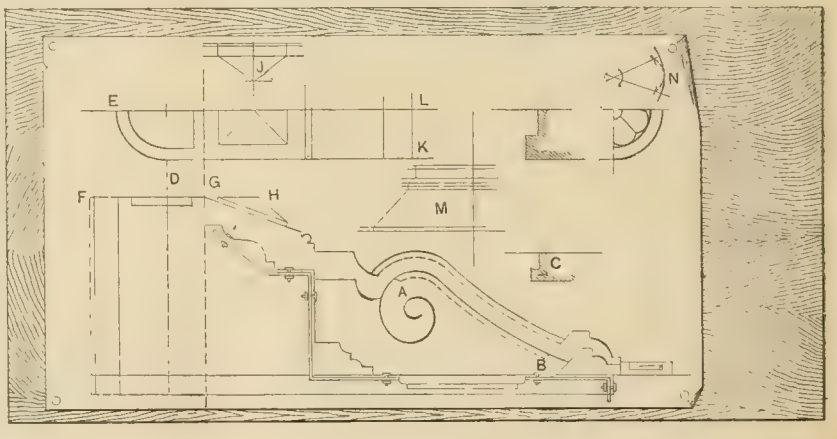


Fig. 2.—Drawing the Patterns.

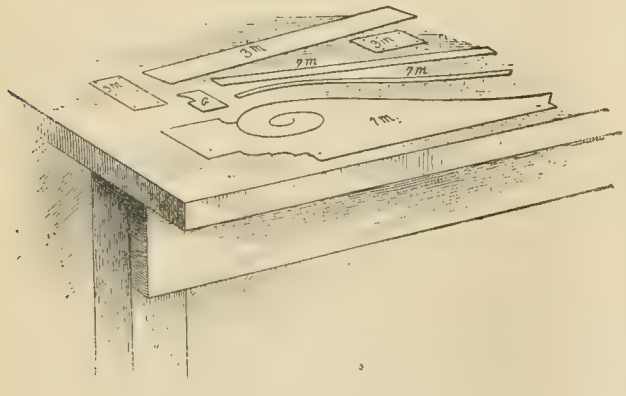


Fig. 3.—Patterns for Bracket.

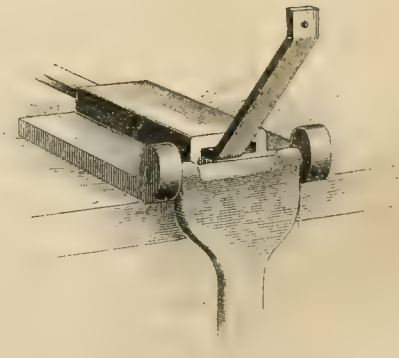


Fig. 4.—Anchor Bending Device.

that goes on the outside will run back 2 inches over the wall line with a 1 inch edge turning in, while the side butting the cornice will be cut to fit moldings of cornices with edges left to turn over same. It will be readily seen from an inspection of the drawing, Fig. 2, that we have laid off a stretchout of face down to top of sink, giving a true face of the part that takes the raised panel H, the pattern for one quarter of which we also show at J.

Take the pattern for this part of the front off the paper in this way, slide a

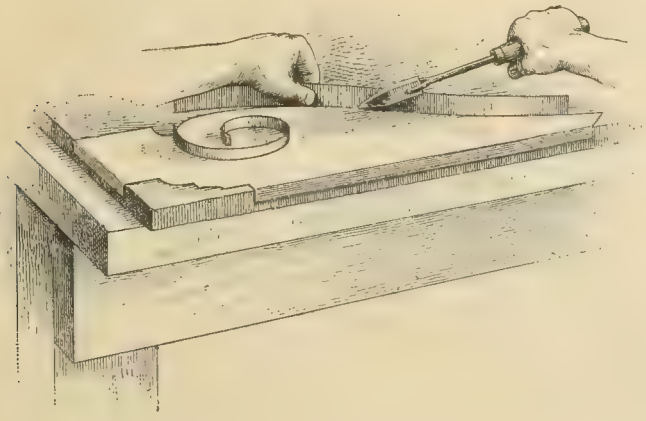


Fig. 5.—Soldering Strip on Outside Edge of Bracket.

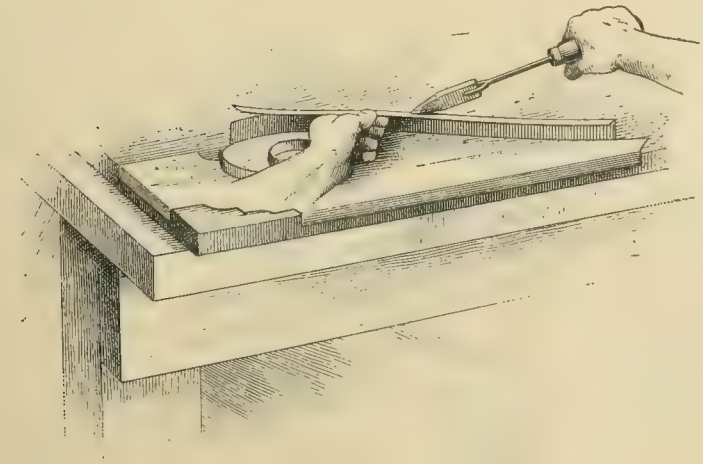


Fig. 6.—Soldering on Sink Strip.

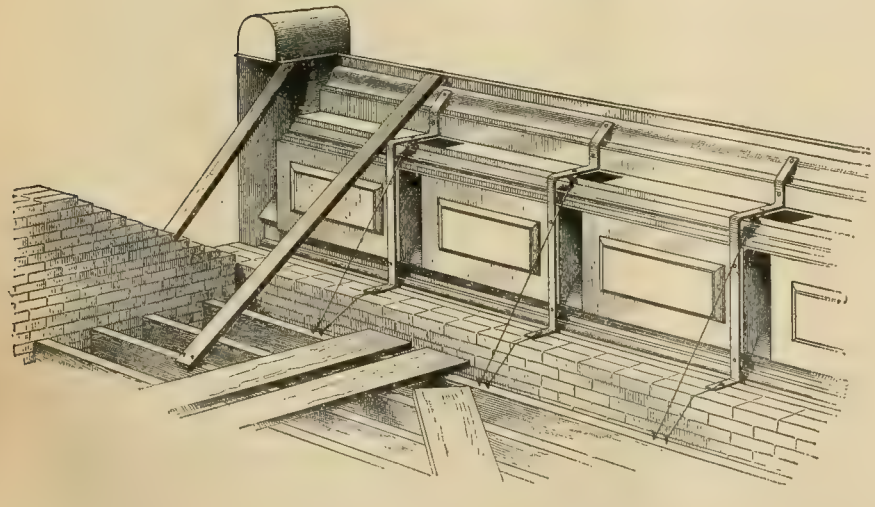


Fig. 7.—Back View of Cornice.

SOME WESTERN METHODS OF CORNICE WORK.

we have taken the stretchout of the top part of head block from the spring line D to center line E, which we have laid off in its proper place on side of head block, and allowed a lap where the sides will meet on top, all as shown by F. From the line G downward piece of iron large enough for the whole pattern under the paper, feeling its position from the outside of the paper, bring one edge about parallel with the line D K, and put in the necessary prick marks for bending, and one mark each at E and L on center line. Turn the iron over, bringing the reverse side of the prick marks at E and L (which can be plainly felt as the iron is being slid around under the paper) to their respective places, and repeat the pricking process, giving the whole pattern. It takes longer to describe this than it does to do it, and it has the advantage of not only saving time and space in the making of the drawing, but it is very accurate as well. The panel head M is taken off in the same way, where its advantages are still more apparent. The sinks in the face at top and bottom of head block are cut in, the piece falling out making the back. The strip used for sink is straight with one edge on it turned in, so that where the before mentioned back is dropped in it will lay on it and be tacked there. The pattern for flutes in base of head block is shown at N.

The molding is the next thing to get out, and as there are no miters in the cornice we take the stretchout with a strip of thin metal. The crown mold runs down to the face of the brackets usually, but sometimes the crown and bed are made all in one: this, of course, depends on whether the stock cuts to good advantage that way or not. The body of the panel is usually cut all in one, but this also depends on the size of it, and is cut by using the panel head for the four miters, the distance between the panel moldings being the length of the head itself. The anchors come next and are made of $\frac{1}{4}$ x $1\frac{1}{2}$ inch band iron, and are fastened to the cornice with $\frac{1}{4}$ x $\frac{3}{4}$ inch flat head stove bolts. For the pattern we take a strip of metal and obtain the stretchout, indicating where a bend is to be made by a line drawn across it, and where holes ought to come by a dot of the marking stick. The anchors, after being punched, are bent to shape in the vise or by a contrivance fastened to the bench, as shown in Fig. 4, and which is made of cast iron.

The next thing we turn our attention to is the putting together of the various parts, and the bracket side comes first, as before. We put a $\frac{1}{2}$-inch strip around the scroll, starting at the terminus of the scroll and cutting off when it comes to the face of the bracket. This strip is soldered on the inside of the bracket side and on the side of cut furthest from wall line of bracket at the starting point, which will allow the scroll to be pulled out when the bracket is together, showing the volute shown in the elevation. This strip is held while being soldered by the forefinger and thumb of the left hand, in the same way as shown for the strip on the outside edge in Fig. 5. Instead of tacking about every inch, as is often done, and then going over it the second time to solder through, we solder right through in the first place by drawing the tack along until it meets that already done.

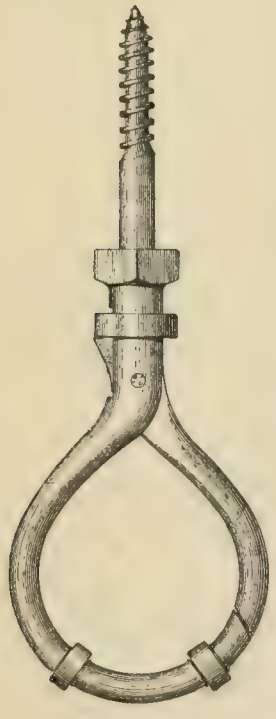
The strip on the outside edge is next put on, as shown in Fig. 5, and right here is where those prick marks save time, as this strip is started from the lower pair on one set of sides and from the upper pair on the other set. Next the sink strip is put on, as shown in Fig. 6, by putting the acid on the inside and soldering from the outside, the solder soaking through and taking a firm hold. These are done in pairs, of course, and after putting the head and foot on one side and soldering fast, the bracket is ready to be put together, which is done by laying the side with head and foot attached flat on the slab and laying the opposite side on top, soldering from the outside as before described. This finished, the bracket is turned up and the back of sink is

pressed up against the sink strips and soldered fast. Care should be taken that the work is true, as this piece makes the bracket rigid. When the molding is formed and put together to the right length, and the panels made up, we are ready to put the sections together. The brackets are spaced off as called for on the elevation and soldered to the bed mold, then the crown and foot are put on, and the panels are dropped in and tacked; finally the whole is riveted off with small rivets headed up on the inside.

The anchors are put on about 4 feet apart and placed so they do not interfere with the panels; that is, they are set near the brackets clear of the panels. This done and the cornice is ready for the building, and is set on the wall, as shown by the section, Fig. 1, and also by the inside or back view of cornice, Fig. 7. Wires are tied to the anchors at convenient points and a spike tied to the wire and driven into any stationary timbers that are handy, such as roof joists or ceiling joists. This mode of fastening allows the cornice to be drawn to proper position and held there by the help of a few braces of wood, all as shown in Fig. 7.

Beaton's Patent Pipe Hangers.

In the accompanying illustrations we show what are known as Beaton's patent pipe hangers, which are being manufactured by the Beaton & Corbin Mfg.



Beaton's Patent Pipe Hanger.—Fig. 1.—Hanger Closed.

Company of Southington, Conn. The hanger shown in Fig. 1 is made of malleable iron, the parts being so adjusted that it can be lengthened according to requirements by simply taking out the screw and inserting a piece of pipe, as the thread employed is a pipe thread. This pipe hanger is referred to as having no bolts, screws or nuts to be removed, and by simply slipping up the ring the jaw may be kept open, as indicated in Fig. 2 of the cuts, while by lowering the ring the jaw is closed and locked, as indicated in the first illustration. The small rolls in the hanger are for the purpose of providing for expansion and contraction of the pipe. The hanger is made in various sizes to meet different requirements. In Fig. 3 of the illustrations is shown what is known as

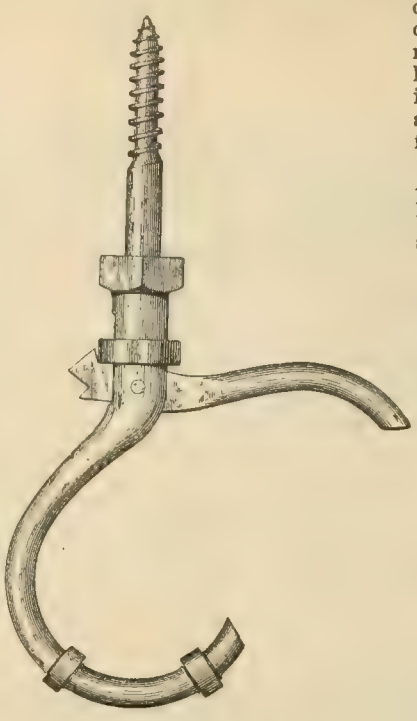


Fig. 2.—Hanger Open.

Beaton's patent chain pipe hanger, constructed of malleable iron and involving several interesting features. It is made in sizes from ½ inch to 6 inches, each hanger having 1 foot of chain attached. This hanger is of such a nature that it can be used by plumbers for hanging soil pipe or for hanging wrought iron pipe.

Fig. 3.—Patent Chain Pipe Hanger.

FLASHINGS.

The Illinois Roofing & Supply Company, 203 Lake street, Chicago, have a prominent exhibit of some of their specialties on the Midway Plaisance at the World's Fair. The Hindoo jugglers' pavilion is roofed with their Perfection steel roofing and the sides are finished with their imitation in steel sheets of brick and rock faced siding. The rock faced siding forms the lower courses of the building above the foundation. Next comes apparently a belt of red brick and above that a belt of yellow brick. The colors are an exact imitation of the natural materials, and at a short distance the illusion is perfect.

A French consular report from Mexico mentions a steady increase in the imports of British sheet iron and sheet zinc for roofs in that country.

Proudman Bros. have bought the old established business of H. B. Todd, Meriden, Conn., and will continue the manufacture of light metal goods, including the well-known Yankee eave trough hangers and other patented articles.

The Columbia Corrugating Mfg. Company, formerly known as the Chicago Steel & Iron Roofing Company, and now located at Niles, Ohio, have almost completed their new buildings and expect to begin active operations in a few days.

The Cortright Metal Roofing Company, Broad and Hamilton streets, Philadelphia, Pa., are making strong claims for their system of roofing and the quality of material employed. They state that they make no low grade goods, no iron shingles and no goods from waster tin plate. Their product is turned out from tinned steel, and the workmanship is referred to as being first class in all particulars.

The Skyes Steel Roofing Company of Chicago, Ill., and Niles, Ohio, write us that they have been awarded a medal and diploma at the World's Columbian Exposition on Sykes' patent cap steel roofing.

Incoming vessels report an unusual crop of derelicts in the Atlantic, many of which are in the direct path of the ocean liners. Twenty of these obstructions were recently reported to the Hydrographic Department in various positions off the coast from Maine to Florida, and the dynamite cruiser "Vesuvius" was sent last week on a mission of destruction toward those floating off the Jersey shore. It is probable that another naval vessel will be detailed to remove the derelicts since located, the number of which is said to have been augmented by last Friday's storm.

One outcome of the recent financial stringency in New York City is noted in an almost complete cessation of speculative building during the past few months. Real estate journals regard this as a not unmixed evil, as the demand for houses is said to be rapidly catching up to the supply, causing greater steadiness in the market. The concomitant lack of employment is, however, pressing hardly on workmen in the building trades.

It is said that Secretary Herbert does not think that the Holland submarine boat, selected by the expert board, fulfills all the requirements sufficiently fully to justify him in expending $150,000 in constructing and experimenting with a boat of this type. The Secretary believes it will be better to wait awhile before building a submarine vessel, so that time may be allowed for the development of a thoroughly trustworthy one.

PLUMBING and GAS FITTING.

The Leading Principles of Scientific House Drainage and Sanitary Plumbing.—II.

By Wm. Paul Gerhard, C.E.

IV.—ACCESSIBILITY.

The fourth principle of modern sanitary drainage is the accessibility of all parts of the work.

By this we obtain not only a greater feeling of security and acquire more actual safety, but we also secure better workmanship, give easy access for inspection of the work, facilitate cleaning operations, secure greater purity and a circulation of air about the plumbing fixtures, expose any slight leaks and render repairs to plumbing work less difficult, less troublesome and less costly.

Applying the principle of accessibility to the drains of a house, we carry them, wherever practicable, in plain sight above the floor and along the cellar wall. Where we are obliged to put the main house sewer under a concrete, tiled or asphalt floor, we provide frequent cleaning and flushing hand holes to gain access to the drain in case of stoppage, and we keep all such hand holes accessible by means of man holes, with cast iron frames and covers. The rest of the pipe may then be safely buried in concrete; in fact, I prefer this method of construction to the method sometimes required of putting such underground drains in trenches with brick walls and flagstone covering, for these in time accumulate dust, dirt and dampness, besides not infrequently forming channels for rats and harboring places for vermin.

This principle efficiently carried out requires all pipes for drainage, water and gas to be placed in plain sight and kept accessible throughout. All soil and waste pipes should be thus arranged, and, as a rule, can be kept exposed and standing free from the walls except possibly on the parlor floor, and here they should be covered by a hinged face board so as to be readily got at. No pipes should be built into walls or put in plastered partitions.

The same rule applied to water supply pipes requires these to be kept outside of walls, plastered partitions and floors. Water pipes in the cellar should not be buried under the concrete floor, and the proper place for distributing pipes for hot and cold water for the upper floors is at the kitchen and laundry ceiling, and not under the parquet floor of dining rooms or parlors, as is still so often done. All rising lines should be carried exposed in closets and in the bathrooms, and no supply pipes should be concealed behind marble casings or tile wainscoting.

Even in regard to gas pipes, which are generally buried out of sight, an effort should be made to keep all risers and main lines exposed, while distributing pipes laid under floors should be kept accessible by screwing down the floor boards over the pipes with brass screws.

Rain water pipes, overflow pipes, refrigerator wastes and other disconnected wastes should also be kept accessible and means provided for flushing them out at regular intervals, and all these pipes should have access holes for removing obstructions.

What is true of the pipes is also applicable to the valves and shut offs on supply lines and gas services, so that in case of the bursting of a water pipe or in case of fire the water and gas may be readily shut off, either from the whole house or on the different floors, without losing much valuable time in searching for hidden stop valves

All traps should likewise be kept accessible. The trap on the main drain should, if under the floor, be incased in a brick man hole. Rain water area and yard drain traps should not be buried out of sight in the ground, but placed in the cellar where they can be got at. All traps under fixtures should remain exposed and access be given to them by clean out caps or brass screws.

The main house drain should be made accessible by placing frequent hand holes, closed by brass trap screws, at the foot of all vertical lines, at all bends, at junctions, at traps, and so on.

Last, but not least, all plumbing fixtures should remain open, exposed and accessible, and all wood casings, which only serve to conceal defects, should be done away with. Until quite recently the custom has been to box up and incase the various fixtures, water closets, wash basins, bathtubs and sinks with much useless wood work. Fortunately, this custom has slowly but surely given way to the new method of open fixtures. This principle is particularly important in the case of water closets and of slop sinks, although it is equally desirable for lavatories and bathtubs, and the less wood work all these fixtures have the better they are. Until recently it required strong arguments to secure a client's approval to the open arrangement of water closet seats, but happily its advantages are now being more universally recognized and adopted.

With the desire of making exposed plumbing as showy and handsome as possible, it has become the custom to specify nickel plated brass piping and traps at all open fixtures. This has recently led, owing to the increased labor for the servants of the household involved in keeping the nickel plated work bright and polished, to a certain amount of prejudice, even in architects' offices, against open work. This misunderstanding—for as such it must be regarded—is a very unfortunate one, for it is not at all necessary, in order to have open plumbing work, to use nickel plated brass piping. On the contrary, work of equal quality from a sanitary point of view can be secured with lead or galvanized pipes, which may be suitably painted with enamel paint, or covered with silver or aluminum bronze and made to look quite attractive.

In the servants' quarters of a house, however, under kitchen, scullery and pantry sinks and laundry tubs, the use of lead traps and waste pipes in open work should, in my opinion, be discouraged, and lacquered brass traps and pipes should be given the preference as being much stronger than lead work in resisting blows or indentations caused by the careless knocking about of pails, cans, &c., under these plumbing fixtures.

Not only should all plumbing fixtures be arranged in an open manner, leaving all parts accessible, but preference should be given in the selection of fixtures to those without hidden, inaccessible waste valves, overflow pipes or traps.

V.—SAFE TRAPPING.

A fifth principle consists in the safe trapping of all house drains, of area and yard drains, of the subsoil drains, if connected with the sewer, and of all plumbing fixtures, in order to prevent the escape of sewer or soil pipe air and disease germs into the house. Rain water pipes should likewise be trapped if they open near dormer windows or near vent flues or light and air shafts.

The trap on the main drain serves to shut off the house from the sewer air in the common street sewer, and thus maintains a perfect isolation of each dwelling. All sanitarians agree that such a trap is necessary where houses discharge into cesspools or sewage tanks, and also where they are connected with old, ill constructed sewers without ventilation and proper flushing appliances. It is also generally considered permissible to omit the trap where the house connects with a well constructed, amply ventilated sewer system, provided always that the soil pipe system in the house is absolutely air tight and the fixtures safely trapped.

But since dangers to health may arise just as much, and even more so, from bad gases and germs evolved from the foul discharge pipes inside of a house than from the outside sewers, it is necessary to trap all plumbing features of a house separately. A popular fallacy is that all so-called "sewer gas" comes from the public sewers In many cases, on the contrary, house pipes generate more "sewer gas" than is found in a well flushed, well ventilated street sewer. Therefore, each fixture should have its own trap, set as close to the fixture as practicable. This trap should be one absolutely safe against self syphonage, against syphonage produced by the flow from adjacent fixtures or fixtures on upper floors, against back pressure and against loss of water seal by capillary attraction and by evaporation.

Space does not permit to discuss separately the numerous forms of water seal and mechanical traps which have from time to time been invented.

In my judgment, mechanical traps should not be used except where the waste water is comparatively clean, as at tank overflows, fountain wastes and the like. For fixtures discharging befouled waste water the simple water seal traps only should be used.

To render the trapping of fixtures safe against the above named dangers two methods may be adopted, one being the method now largely called for in Board of Health regulations of the venting or back airing of traps, the other and the more advanced one being the

use of non-syphoning traps or of anti-syphon trap attachments, or security shut offs. The former method is costly, complicated, fraught with new dangers and not altogether reliable, whereas the latter is simple, efficient and safe, if judiciously arranged. My personal preference, in conformity with the third fundamental principle of simplicity of arrangement, has always been for the second method. With few exceptions, Board of Health and Building Department rules still require the method of back air pipes. It seems quite desirable that all such rules should make it at least optional with the owner or architect which of the two systems he will adopt.

Double trapping of house drains is likewise objectionable and unnecessary, and so is the double trapping of fixtures, particularly of water closets. Double trapping in the case of fixtures having traps with back air pipes often leads to the establishment of dangerous "by passes."

As regards the supply system, as well as the gas pipe system, it is almost superfluous to state that all manner of traps in such piping must be carefully avoided.

The disconnected pipe systems, such as refrigerator wastes, boiler blow offs, floor drains, fountain wastes, safe wastes, tell tales, overflows and the courtyard and area drains, if disconnected, as is sometimes done, need not ordinarily be provided with traps, because they are not connected directly with any soil, waste or drain pipe. They should discharge over a properly trapped water supplied sink, placed in the lowest part of the house, and all that is necessary is to prevent their acting as conductors of cellar air by placing a hinged brass flap valve over the outlets at the sink. Overflows and blow offs from tanks on roofs of buildings may safely discharge into a roof gutter or into a leader pipe.

VI.—THOROUGH VENTILATION.

We come now to the consideration of a very important principle in house drainage, the thorough ventilation of the drainage system. In order to render the soil, drain and waste pipe system of a building safe it is necessary that the air contained in these pipes be kept constantly in motion and continually changed. This is effected by extending all soil, waste and vent pipe lines the full size up to and through the roof. It is even better to increase all pipes from under the roof upward, and this enlargement is very necessary in the case of the smaller waste and vent pipes, because roof pipes smaller than 4 inches become sometimes closed in winter by hoar frost.

All pipes above the roof should be kept open, free and unobstructed. Return bends, ventilating caps and all forms of patent ventilators practically do more harm than good.

But in order to have a circulation of air in the soil pipe system, the pipes ought to be open not only at the top, but should have a foot vent at the lowest point. Where the trap on the house drain is omitted this foot vent is not needed, as air is then admitted from the street sewers. Where the trap is used a fresh air inlet pipe connected with the drain at the house side of the main trap should be provided. The fresh air pipe should not terminate in close proximity to windows, but it is equally important to avoid placing it where it may become obstructed by snow, ice or dirt.

It should be a rule to avoid all dead ends in the pipe system, and hence where a fixture cannot practically be located within 5 or 6 feet from the main ventilated soil pipe the lateral waste should under all circumstances be continued upward to the roof independently, and this rule applies whether the fixture is trapped by a common S-trap or by a non-syphoning trap, or by a mechanical trap. Where the traps of fixtures are located within a few feet from a well ventilated upright line it may be safely assumed that a sufficient diffusion of air takes place in the short lateral pipe, particularly if the fixtures are in constant daily use.

The ventilation of plumbing fixtures is suitably accomplished where open or exposed work is used by the proper ventilation of the apartment, and hence it is important to place fixtures in well lighted rooms having outside windows. Fixtures such as water closets or housemaids' slop sinks should never be located in dark interior closets without ventilation, nor should servants' water closets be located in dark, out of the way corners of a cellar.

Ventilation should also be provided for the tank for drinking water, as well as for refrigerator waste pipes, particularly in the case of apartment houses.

VII.—EFFICIENT FLUSHING.

Another cardinal principle is the efficient flushing of the whole plumbing system. It should apply not only to the main house drain, but likewise to the soil pipes, waste pipes, the lateral branches, the traps and the fixtures.

The regular flushing of house drains is accomplished, 1, by laying them with a grade which will insure a cleansing velocity of the flow, and, 2, by restricting them in size so as to concentrate the sewage flow. Where this object can be attained the drains may be called self cleansing. Where the fall is necessarily slight artificial flushing appliances, such as automatic syphon flush tanks, should be constructed at the head of the drain. This matter has, in my judgment, received far too little attention in the past. It has been customary to rely too implicitly upon the scouring power derived from the connection of rain water pipes with the sewage drains. While the beneficial effect of a good rain storm in the flushing of house drains cannot be denied, it must not be overlooked that there are often protracted periods of dry weather, particularly in the summer season, when house drains are most in need of a regular periodical flush.

With soil and waste pipes restricted in size it is believed that the daily flow from the plumbing fixtures will keep these upright pipes sufficiently scoured for all practical purposes.

The disconnected refrigerator waste pipes need a frequent application of a thorough flush, which can in most cases be readily accomplished by branching the blow off from the kitchen or laundry boiler into the refrigerator waste and blowing off the boiler at regular intervals. Where this cannot be done, it will be found useful to put over the refrigerator waste pipe a small automatic flush tank.

Safe waste and drip pipes ordinarily receive no flushing whatever, and hence I am inclined to favor their entire omission, except where they serve to protect expensively decorated ceilings. Safe waste or drip pipes from urinal platforms are particularly objectionable and are often the cause of bad odors in toilet rooms. Where floors in toilet rooms of office buildings or in hospitals, railroad stations, etc., are tiled, and where an abundance of water for floor washing is available, and this washing is done regularly, large size floor drains may with advantage be employed, and should discharge openly over trapped sinks on the lower floor.

The principle of constant flushing should also be applied to the traps under the fixtures, and it is suitably accomplished, 1, by restricting the diameter of the traps so as to insure a scour through the traps, and, 2, by the use throughout of quick emptying fixtures, having large outlets. In this respect a great improvement in the manufacture of plumbing appliances has been noticeable during the past years. The old fashioned lavatories, with small waste outlets obstructed by strainers, have been replaced by basins with large outlet, and the same is true of bathtubs and plug sinks. In the case of kitchen sinks with open strainer, the flow from which is generally a mere dribbling stream, an improvement in the discharge may be effected by the use of a flush pot or similar sink attachment, which collects the dribbling stream until it becomes full, and then discharges rapidly the whole contents either by an automatic device or by the lifting of a plug. Such a device is also useful as a grease trap, and much superior to the forms of grease trap commonly used under sinks, which accumulate putrefying grease, and are seldom, if ever, cleaned by kitchen servants.

As regards plumbing fixtures those receiving the alvine discharges from persons—viz.: water closets, urinals and slop sinks—should always be efficiently flushed from special flushing cisterns, discharged either by hand or automatically, and the bowls should be provided with proper flushing rims.

Water closets as well as other fixtures with movable mechanism in the bowl or with mechanical obstructions of any kind, or those having unnecessarily large fouling surfaces, should be avoided as being liable to remain imperfectly flushed.

(*To be concluded.*)

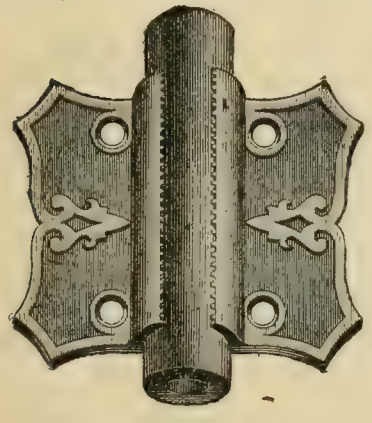
The Pratt Institute Trade School.

The 1893-94 course of the trade school attached to the Pratt Institute, Brooklyn, commenced on Monday, September 25, with a promising number of students in the various trades in which instruction is given; namely, plumbing, carpentry, house, sign and fresco painting, and machine work. The entries in the plumbing class were, as usual, the most numerous, numbering 45 young men, nearly all of whom are working as helpers in the trade in the city of Brooklyn. As the plumbing school only accommodates 50 pupils, this leaves but 5 vacancies, which will probably be filled before the close of this month, when the registration of candidates closes. The course of instruction followed in the Pratt Institute plumbing class, which applies in its salient features to those of the other trades, was fully outlined in *The Metal Worker* of June 24, 1893. It may be of use, however, to state that the full course, entitling a pupil to a certificate of profiency, after examination by a committee of the Journeymen Plumbers' Association of Brooklyn, extends over two periods of six months each; a fee of $15 being payable for each half-yearly term. All tools and materials are furnished free of charge; and the hours of instruction are from 7.30 to 9.30 p.m. on Mondays, Wednesdays and Fridays. Applicants for instruction must, according to the rules of the

institute, be between the ages of 16 and 25. The equipment of the plumbing shop is complete and the instruction given, both practical and theoretical, is said to be the best obtainable.

Evory's Plumbers' Tacks.

The illustration herewith shows a plumbers' tack, now being introduced to the trade by the Evory Mfg. Company, 21 and 23 Ann street, New York. It is made of cast iron, and furnished either plain, tinned or nickel plated. The claim is made that the device does not need to be soldered to the pipe, thereby saving time and material. The jaws are ridged and so made that the tighter the screws that fasten up to the wood work are turned the tighter they grip the pipe, tests having shown, it is claimed, that they will sustain a strain far in excess of any that is likely to be put on a lead pipe. Several new modifications have recently been added to the variety,



Evory's Plumbers' Tack.

adapting them to all the requirements for ceilings, side walls, corners, cornices, &c. One form is made to hold two pipes for the flush and supply of water closet tanks and for holding bibbs or T-branches. Their quick adjustment and wide usefulness have made them popular with plumbers who have used them.

TRAPS AND VENTS.

A PLEASING FEATURE of the recent convention of the Master Plumbers at Springfield, Mass., was the banquet in the evening and after dinner speeches that followed.

AN EXCHANGE SAYS that the jokes innumerable that have been perpetrated on the subject of plumbers' bills pale before an episode in real life which happened in Washington. Bills to an enormous amount having been frequently rendered by a plumber of that city on a piece of property without the result of liquidation, law proceedings were finally instituted. As a result the house sold under the hammer failed to bring the amount charged in the bill of the disgruntled mechanic.

BUCKINGHAM PALACE is at present in the hands of the sanitary engineers, says a London paper. For several years considerable sums have been spent upon the drainage, but it has been rather surface work than otherwise, and the object of the present work is to bring the system in full accordance with modern science. The huge structure so familiar to Londoners is a comparatively modern building, and takes its name from John, Duke of Buckingham, who built himself a residence on the spot just two centuries ago. The palace was never occupied by George IV, and it was not till 1857 that the Queen chose it as her residence; but after the death of the Prince Consort her Majesty apparently took a dislike to the place. The value of the property has increased at an enormous rate, and several well-known experts place its present value at 5,000,000 sterling—five times as much as its original cost.

THE PLUMBING HOUSE of McDonald & Glennin, at Macon, Ga., recently lost its senior partner by death.

AUGUST WAGNER, a prominent young plumber of Wheeling, W. Va., was recently married to Miss Honora Walton. The ceremony was witnessed by a number of friends.

THERE STILL EXISTS at Norfolk, Va., some slight difference between the master and journeymen plumbers as regards the number of helpers or apprentices that shall be employed in a single shop.

PRESIDENT DANIEL J. FINNERTY of the National Association of Master Plumbers was recently the guest of the Massachusetts Master Plumbers' Association at their convention in Springfield, Mass. The new plumbing laws of the State were the subject of considerable discussion.

THE BOARD OF PLUMBING EXAMINERS was organized in New Bedford recently, consisting of City Physician Kelly as chairman; John Green, secretary, with Superintendent of Buildings Rielly as third member of the board.

J. P. FOX secured the contract for plumbing in the Seventh Ward Schoolhouse at Eau Claire, Wis., at a reported price of $673.95.

THE CONTRACT for the plumbing and sanitary arrangements in the High School building at Portland, Maine, has just been awarded to M. C. Hutchinson of that city, the consideration being $5080. Mr. Hutchinson is a young man whose close attention to business and strict integrity have obtained for him a large share of the best patronage of the city.

A LATE ISSUE of one of the Detroit evening papers states that A. D. Benjamin, a wealthy Toronto hardware dealer and one of the principal stockholders of the Detroit Steel Clad Bath Company, has recently fallen heir to an immense fortune through the death of his father in England.

AT A RECENT MEETING of the Board of Health of Los Angeles, Cal., a report was made of the sanitary condition of the public buildings, with the statement that very little improvement had been made since the previous report, which gave very much the same information. Steps are now being taken, however, to improve the character of the plumbing work in the different public buildings. A complaint was made to the board of the work done for a citizen by a plumber, and after some discussion on both sides, the board decided the matter was a breach of contract rather than a question for them to decide.

E. BAGGOT, 169 and 171 Adams street, Chicago, is doing the plumbing in the St. Nicholas Hotel, and is supplying the electric light fixtures for the residence of Adolphus Busch, St. Louis, Mo.

AN EASTERN PAPER of recent date gives some particulars of the house of S. Wilder & Co., Holliston, Mass., manufacturers of copper force, well, cistern and air chamber pumps. The house was founded by Houghton & Joslin, who were succeeded in 1849 by the present firm, which consists of Charles and George Wilder.

THE PLUMBER'S ASSISTANT was plugging away at a piece of lead pipe when a city missionary happened along, says the Detroit *Free Press*, and after a little preliminary talk said:

"My dear young friend, do you know the value of time?"

"You bet I do," was the frank response, "I am working by the day."

To encourage the mining industry of Chile the Government of that Republic has, as previously mentioned in these columns, decided to hold a mining and metallurgical exposition at Santiago, opening on March 15, 1894. Foreign manufacturers have been invited to exhibit machinery and tools and other apparatus connected with mining, the suggestion being made that only models or drawings of heavy machinery, motors and boilers be sent. The space needed will be given to exhibitors who apply for it before January 1, 1894, and motive power will be supplied. The freight on exhibits from Europe or the United States will also, it is understood, be paid by the Chilian Government. The exposition will close on April 30, 1894.

Co-operation has, says the *Mining and Scientific Press* of San Francisco, Cal., been successfully adopted as the method for starting several of the idle mines at Leadville, Col. The Maid of Erin has set the example, and others are expected to follow. The plan whereby the resumption took place was an agreement between the men and the management to deduct the expenses of operating from the gross receipts and divide the net profits on a percentage mutually satisfactory. Between 50 and 100 men went to work on the first day, and should the scheme prove successful the force will be largely increased, and many idle men thus be employed.

One of the novel business trades of Boston is that of a dealer in second hand plate glass. Nearly all of this glass, says an exchange, is bought by the dealer from insurance companies. The large plates of this kind of glass are insured when put in a window, and when any of them is broken the owner of the injured glass usually prefers that the insurance company should replace the broken piece rather than that he should be paid its price. The dealer in the second hand glass contrives to utilize what remains of the unbroken part of the glass.

At the office of the Ansonia Brass & Copper Company, 19 Cliff street, New York, is prominently displayed a large sheet of Tobin bronze similar to those used in the construction of the victorious cup defending yacht "Vigilant," the material for which was supplied by the Ansonia Company.

The following details of the amounts of various materials used in the construction of the new Tower Bridge in London are given by an English journal: Bricks, 24,000,000; granite, 415,000 tons; cement, 19,000 tons; concrete, 72,000 cubic yards; and iron and steel, 15,800 tons.

TIN PLATES.

The British Tin Plate Outlook.

The position of the British tin plate trade, according to late advices, is very discouraging to manufacturers. Prices are at the lowest point on record, and there is thought to be little prospect of improvement for some time to come, notwithstanding the large reduction of output that has prevailed for the past three months. Bessemer cokes are being quoted at 11 shillings a box, f.o.b. Swansea, a price, says an English iron trades journal, which would until recently have been regarded as ruinous to the producer. Steel, however, is now bought at very low figures, and throughout the trade, since the introduction of the United States tariff on tin plates, the Welsh works have been remodeled and nothing left undone that would tend to lower the cost of production. Although some of the makers can, it is believed, make a bare profit out of the present market prices, many of the works are for the present shut out of the trade. The cause is, of course, mainly due to the falling off in American orders, owing, perhaps, in a measure to American competition, but principally to the late financial stringency on this side and the uncertainty in regard to tariff legislation. Until these causes are removed or modified it is not expected by Welsh tin plate makers that any revival can take place in their business. Meanwhile many tin plate works are still closed, while others are mentioned as having given notice to their work people of an intention to do so shortly should trade not improve. The majority of the works still in operation are, moreover, either running on short time or with greatly reduced forces; consequently severe distress exists in the tin plate districts, and the resources of the Tin Platers' Union are taxed to the utmost to provide for members out of work.

The Jaques Tinning Pot.

We show in the accompanying engravings illustrations of a new tinning pot for which a patent has just been granted to George W. Jaques of the firm of A. A. Thomson & Co. of New York city. Fig. 1 is a side elevation of the pot, while Fig. 2 is a sectional view showing the position of the bath and the arrangement of the special feature of the pot, which is the air flues at the exit N. The object in the construction is to obtain two temperatures at the bath with one fire and to regulate the temperature of the metal under the grease pot. The great difficulty heretofore has been that plates in their continuous passage through the metal became so highly heated at the delivery end that they ignited the oil, while if two fires were used to regulate the temperature greater expense was involved. Another method of overcoming the difficulty to which the patentee refers is the passage of air currents about the grease. A side elevation in Fig. 1 shows the brick work of the apparatus and the position of the single furnace, as well as the opening to the cooling flues at the right. Fig. 2, which is a sectional view, shows the interior construction more clearly. A is the main portion of the bath with the furnace under it. The sheets are fed at the left hand and delivered at the right hand, being guided along the bottom of the bath by the guides C. They are drawn out through the grease through rollers. At the delivery end is an inclosure, A^1, the side A of which dips down into the metal in the bath, thus cutting off from the main bath a portion, within which inclosure the oil rests

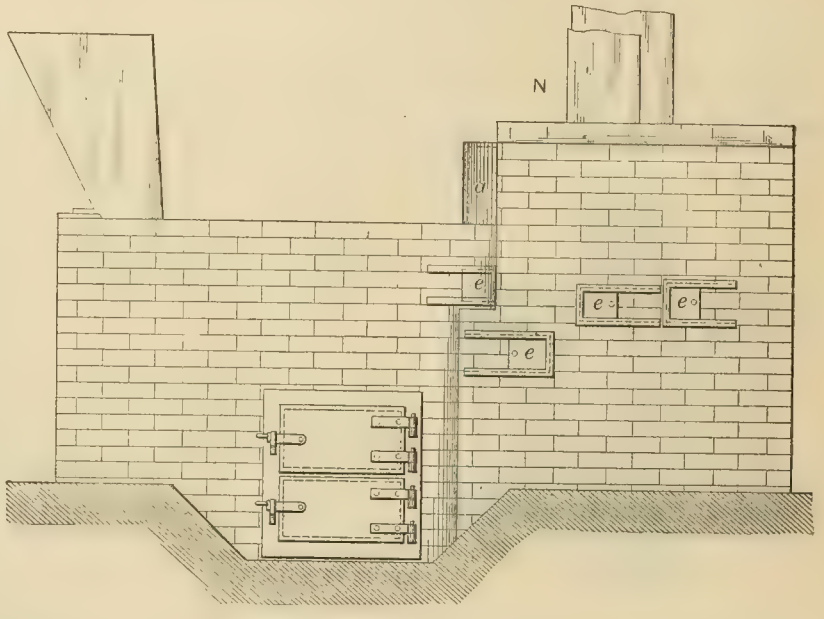


Fig. 1.—Side Elevation of Pot.

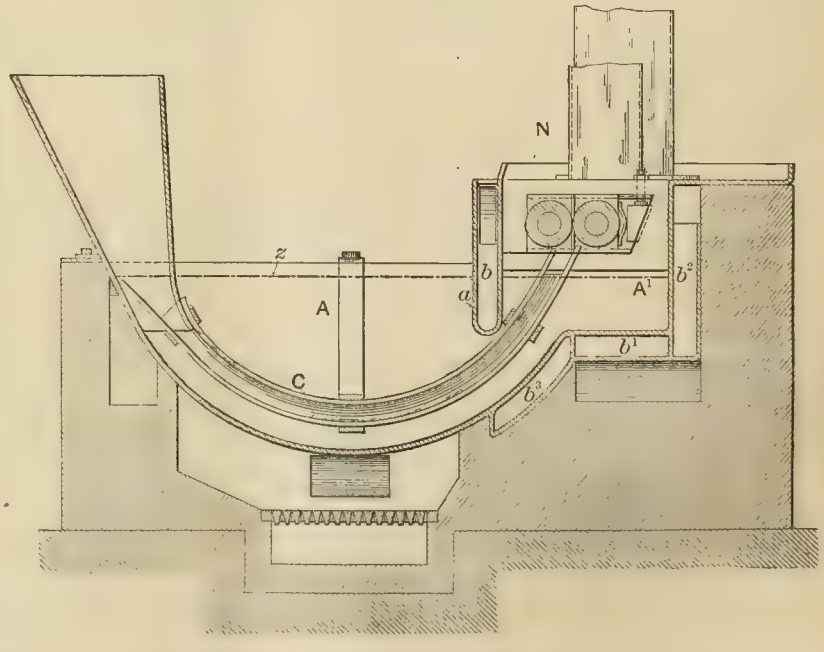


Fig. 2.—Sectional View of Bath.

THE JAQUES TINNING POT.

on the molten metal. The dotted line Z shows the usual level of the metal in the bath, the oil level being at about the axes of the rollers. A special feature of this apparatus is the control of the temperature within the grease pot A^1, maintaining it lower than the main body of the pot by means of air flues. The walls and bottom of the inclosure A^1 are made double, so as to leave flues around the inclosed metal and oil through which the air may be made to circulate. In the illustration four flues are shown, b, b^3, b^1 b^2. The flue b^3 is under the curved portion of the bottom of the bath, the flue b^1 is under the flat portion or shelf of the bottom of the inclosure A^1, and the flue b^2 is in the wall opposite A. The air enters these flues at openings shown in Fig. 1 at *e e e e*, which openings are controlled by slides. After circulating through the cooling flues the air enters either through the flue in the chimney or into a separate uptake. The front flue b and back flue b^3 are connected by a cross flue; on the other side, where the uptake is situated, the several flues b, b^3, b^1 and b^2 open into a cross flue, which forms the enlarged base of the uptake. The arrangement is such that the air may be allowed to flow through any one or more flues, and may be regulated by register slides, thus controlling the temperature of the metal and oil within the inclosure A^1 and keeping it normally below the temperature of the main portion of the bath instead of permitting the oil and metal to become gradually hotter from the passage of the hot plates.

American Tin Plate Production.

The *American Metal Market* of October 14, 1893, in printing Special Agent Ira Ayer's report on domestic tin plate production for the quarter ended June 30, 1893, puts the increase in the output of American tin plates made from black sheets rolled in the United States in a very striking manner, as follows: The black plate produced and used in this country amounted to 785,547 pounds for the quarter ending September 30, 1891. In the 21 months following this date the production increased in the proportion indicated by the rules below, so that for the quarter ended June 30, 1893, the American plate used in this country was 18,264,225 pounds, showing that the product of this country has increased to about 2314 per cent. of its former dimensions.

Quarter ended	
September	30, 1891
October	31, 1891
March	31, 1892
June	30, 1892
September	30, 1892
October	31, 1892
March	31, 1893
June	30, 1893

No compilation of statistics and reports could tell the tale of progress more effectually than the above presentation.

SCRAP.

The New Castle Tin Plate Mill, New Castle, Pa., resumed operations last week, with all departments of the large establishment in full work, employing about 500 persons. The machinery is reported as running very smoothly, and the plates turned out as of an entirely satisfactory character. American workmen have, so far as possible, been engaged in the works.

In striking contrast to the general run of Welsh tin plate works at present, those of William Williams & Co. of Morriston are reported by a London trade journal to be busy on a contract to supply an American firm with 500,000 boxes of 19¼ plates. The price to be paid is said to be very low.

A. A. Thomson & Co., 213 Water street, New York, manufacturers of tin plates, report their Central brand of American ternes to be receiving a very wide appreciation at the hands of the trade. Their tin plate works have been kept fairly busy, even during the recent depression, on orders for these plates. The recent addition of a third tinning machine has enabled the firm to increase their output nearly 50 per cent.

The port of Swansea, Wales, ships about 65 per cent. of the total exports of tin plates from Great Britain.

The New York *Journal of Commerce and Commercial Bulletin* has been obtaining the opinions of prominent representatives of various trades in this city in regard to the prevailing business depression. Among other firms engaged in the tin plate and metal trades, Phelps, Dodge & Co. are reported as saying that trade has suffered 25 per cent. from the inaction of the Senate in regard to the Silver Purchase Repeal bill. The firm of C. S. Trench & Co., tin plate brokers, are of the opinion that 50 per cent. has been lost in a majority of branches in the trade, owing to the same cause having destroyed reviving confidence.

J. O. Hughes of the firm of Hughes & Patterson, rolling mill proprietors, Philadelphia, Pa., died a few days ago of apoplexy.

Recent troubles in Central and South American republics have caused an active drain on our naval resources for war vessels for the protection of United States interests in the disturbed quarters.

The situation of the unemployed miners on the Gogebic range is reported by Western papers to be becoming serious. Bread riots have already occurred in several towns, and further disturbances are feared. Efforts are meanwhile being made to relieve the distress by raising money to feed the men and their families, as no present prospect of employment can be be held out to them.

Representative Caminetti of California has introduced in the House a bill to provide for the establishment of a gun factory for the finishing and assembling of heavy ordnance at Benicia, Cal., at the cost of $1,000,000.

Ground was broken on October 12 for the new Bourse Building in Philadelphia. The work will, it is said, be vigorously pushed, and the building is expected to be well under way by spring.

Canada's mercantile fleet on the registry books last year numbered 7007, with a tonnage of 964,129, a decrease in the year of 84,364 tons.

A notable exodus of Hungarians from Pennsylvania has occurred during the past two months. At least 7000 laborers of that nationality are reported as having left the State, owing to the poor labor market. Most of them have returned to their own country.

HEATING AND PLUMBING.

NEW WORK AND CONTRACTS.

Shumway & Rielly, Northampton, Mass., will use a Victor steam heater in P. Dewey's new residence.

Daniel S. Ingersoll will do the heating and R. & J. Robertson will do the plumbing in the new Universalist Church at Beverly, Mass.

A. L. Fessenden, Townsend, Mass., is about to have a steam heating apparatus put into his house.

The city of Bath has expended $2000 for a steam heating plant in the High School building. A recent test proved it to be satisfactory in every respect.

A new steam heating plant has been installed by W. H. Hill in the freight and passenger depot at Marlborough, Mass., for the Consolidated Road.

A steam heating plant is being installed at the Cathedral at Burlington, Vt., and it will also heat the Bishopric residence.

A steam heating plant has just been completed in the Lutheran Orphans' Home, at Mount Airy, Pa.

Manchester & Ward of Turners Falls, Mass., are doing a fine plumbing job in the new Jacobus mansion. They will also install the heating apparatus, which will be on the Gurney system.

The Hamburg American Packet Company have made contracts for the construction of five large twin-screw steamers for Transatlantic service. Three of the new steamers will be built at Belfast, and the other two at Stettin and Hamburg respectively. They will each be of 7800 tons and 465 feet in length, and will have a very large freight capacity. When these five steamers are completed, the Hamburg-American line will own the second largest tonnage in the world, being less than that of the Peninsular and Oriental Company only.

The contract for building the much talked of Syrian railroad from Haifa to Damascus has been awarded to a Chicago firm, Huss & Townsend. Work is to be begun immediately. The enterprise has been initiated by English capitalists, who purpose ultimately extending the road to India if Persian concessions can be obtained.

A combination of all the street railways of San Francisco is announced, with a capital stock of over $18,000,000, the greater portion of which is understood to be owned by the Southern Pacific Company.

Professor Bland of Vermont University is making experiments with the view of converting culm into a fertilizer.

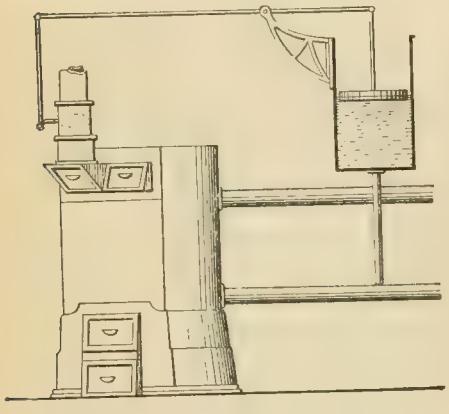
The great coal strike in England, which began on July 28, is practically over, a large majority of the strking miners having resumed work.

The recent depression in business has had a marked effect in decreasing the consumption of tobacco and beer, as shown in a material falling off in the internal revenue from those manufactures.

STEAM AND HOT WATER.

A Hot Water Regulator.

The illustration which we present in this connection is reproduced from a London exchange, and shows a device for regulating the fire in a hot water apparatus. It is made by the Patent Automatic Damper Company, 97 Fleet street, E. C., London, and depends for its operation upon the increase in the bulk of water in the cistern as it becomes heated and which acts upon a float that rises and falls as the water in the pipes becomes hotter or colder. It consists of a small tank connected with the return pipe of a hot water system and a float connected by levers and rods with the draft dampers. The apparatus shown is evidently intended for greenhouse use, but could be applied to a house



A Hot Water Regulator.

system by modification. The explanation given does not say how the damper is to be regulated, but it is possible that by an adjustable connecting rod or a system of weights the temperature of the water in the system could be regulated to meet the requirements of the weather.

The A. A. Griffing Iron Company.

A catalogue in blue covers and printed in red and black reaches us from the A. A. Griffing Iron Company, 15 Dey street, New York. It is devoted to their newest goods in the way of steam and hot water radiators. The Bundy Columbia, which was illustrated in *The Metal Worker* a short time since, occupies the first page, followed by the Bundy Elite. Half-tone engravings are used to show the Bundy Pyro, Pyro wall radiator, the Bundy Princess and the Bundy Renaissance, the latter being represented in several forms for both steam and hot water. These are followed by some of the makers' standard goods and the Bundy hot closet dining room radiator. A page is devoted to showing the Bundy box radiator for the direct-indirect style with a fresh air inlet. The Bundy Crescent dampers are for use in connection with direct-indirect-radiators to control the air supply. Then follow the Bundy Perfect direct-indirect radiators, the Bundy Climax indirect radiator and the Bundy Pin radiator. The Bundy Climax is also made as a vertical direct radiator. Several pages are then devoted to Bundy separable mercury bath hydrothermometers, Bundy bonnetless quick opening valves, full opening radiator valves, automatic air valves, bronzing powder and liquid enamels, expansion tank and floor and ceiling plates. This catalogue will be found very convenient in having grouped together the newer goods of this concern. It is now being mailed to the trade and will also be distributed among the architects and builders.

HEATING NOTES.

THE RICHMOND steam and hot water heaters are the subject of an interesting little pamphlet of 32 pages which reaches us bearing the imprint of J. W. Gifford & Co., heating and plumbing engineers, Bank and Park streets, Attleboro, Mass. The goods named are carefully illustrated and described in a manner to attract the attention of the trade, while numerous tables give prices and capacities of the various sizes manufactured. A feature of the pamphlet is found in a number of testimonial letters from those who have used the Richmond heaters, while numerous engravings represent buildings heated with these goods.

T. C. JOY, 48 Centre street, New York, reports an increasing demand for low or window radiators. Some new samples of this character of radiators are to be seen in the showroom at the address given.

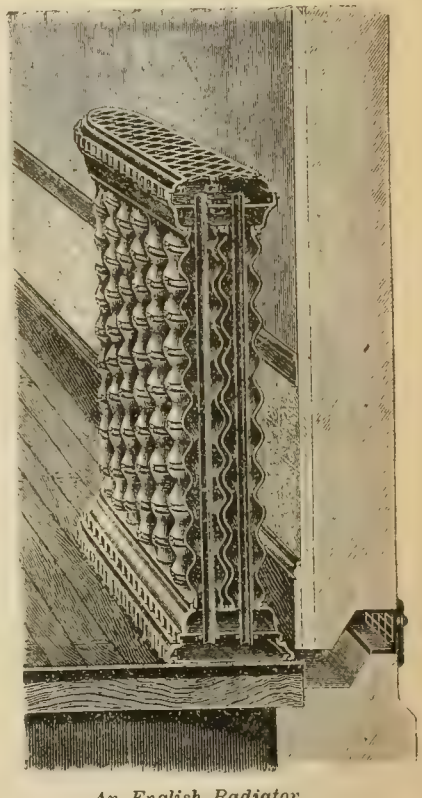
COUNCILS' HIGHWAY COMMITTEE of Philadelphia, Pa., had before it recently an important ordinance, which was to grant permission to the Overbrook Steam Company to enter upon streets, avenues and highways of the Carpenter Land & Improvement Company, at Upsal street and Germantown avenue, in the Twenty second Ward, and to lay pipes, conduits and service pipes to supply steam for heating purposes. It was agreed to report this favorably after the adoption of an amendment of U. C. Smith that all streets shall be dedicated within three years, or sooner if requested by the Director of Public Works. The ordinance provides for the filing of a bond for $25,000 to meet possible damages, and the free heating of all school houses, fire, patrol, and police station houses and other public buildings now existing or hereafter constructed on the line of the steam mains.

E. RUTZLER, 178 Centre street, New York, president of the National Association of Master Steam Fitters, is installing a steam heating plant in the new Continental Life Building. An order has been placed with the American Radiator Company for the Excelsior radiator for use in this building.

THE AMERICAN BOILER COMPANY, at 94 Centre street, New York, have recently received a number of orders for hot water apparatus for greenhouse heating. Among them may be noted one from John T. Herr of Dover, N. Y., who has recently set a No. 25 Perfect hot water heater in an asparagus house as an experimental venture, and if it proves a success a number of similar houses will be built later on ; one from J. T. McNab, who is setting a No. 41 Double Tropic to heat three greenhouses in Paterson, N. J., and one from F. W. Grant of Nyack, N. Y., who is setting a No. 16 Little Giant for a small rose house.

An English Radiator.

The illustration herewith, from a foreign exchange, shows one of Richardson's patent radiators, made by the Meadow Foundry Company, Mansfield, England. Of it our contemporary says: The heat is radiated equally in every direction, including the floor,



An English Radiator.

thereby preventing cold drafts. The annular corrugated tubes occupy the same space as ordinary 2-inch pipes, and contain but little more water than the latter, though they present a radiating surface equal to that of 4-inch pipe. The radiators are made as direct radiators only, or with provision for the distribution of warmed fresh air through the air chambers and tubes. All the joints are lathe faced and packed. The general form of this radiator will not be novel to American readers, but the particular combination of features shown may be suggestive.

FRANK WILLIAMSON AND WILLIAM COLE, employees of R. & J. Robertson of Beverly, Mass., are being congratulated on the superior job of steam fitting they have done in remodeling the heating plant in the fire engine house.

J. Augustus R. Hall.

Supplementing the brief notice of the death of J. Augustus R. Hall, one of the oldest and most prominent metal merchants in the city of Philadelphia, and late of the firm of Hall & Carpenter, we present this week an excellent likeness reproduced from a photograph. Mr. Hall was born in Paterson, N. J., in the year 1824, and early in life was, by the death of his father, thrown on his own resources. After receiving a common school education he found employment for a time on a farm in his native State, but after a few years he left agricultural pursuits to enter the United States Navy, in which service he remained nearly five years, visiting nearly all the principal seaports of the world. Subsequently he entered the house of W. N. & G. Taylor, importers of tin and terne plates, metals, &c. In January, 1862, Mr. Hall, by reason of his excellent business qualifications and marked executive ability, was admitted into copartnership in connection with William B. Taylor, the style of the firm being N. & G. Taylor Company. He took entire control of the sales department, and commenced the direct importation of tin and terne plates by a line of steamers between Philadelphia and Liverpool, which was started with his assistance. In February, 1867, he withdrew from the firm of N. & G. Taylor Company and founded the house of Hall & Carpenter at 709 Market street. In the year 1883 Mr. Carpenter died, leaving Mr. Hall the sole proprietor of the business. Mr. Hall was liberal in dispensing charity, and was connected with some of the leading clubs and organizations of the Quaker City. He was a member of the Board of Trade, Commercial Exchange, Maritime Exchange, Master Builders' Association, Historical Society of Pennsylvania, Franklin Institute, Manufacturers' Club, Philadelphia Lodge No. 72, F. and A. M., Jerusalem Chapter No. 3, R. A. M, Kadosh Commandery, K. T., and was Sovereign Grand Inspector-General of the Ancient Accepted Scottish Rite of Freemasonry.

The funeral services took place from Mr. Hall's late residence, 1742 Green street, after which the remains were taken to the family plot at Mount Vernon Cemetery. The deceased leaves four sons and a daughter.

J. AUGUSTUS R. HALL.

A certain experimenter, says the *American Architect and Building News*, has been trying the comparative effect of various sorts of decoration upon the lighting of rooms. Taking a room hung with black cloth, he illuminated it with 100 candles, and then counted the number of candles necessary to bring rooms decorated in other ways to the same degree of illumination. He found in this way that a room with a dark brown paper required 87 candles to make it as light as the black cloth one with 100; a room with blue paper took 72 candles, and one with a pale yellow paper required 60. A room lined with panel work, either in natural wood or in white paint, needed 50 candles; one with dirty paneling required 80, and a room with plain, whitewashed walls took only 15.

Metallic Furniture.

In speaking of the increasing use of metal in the manufacture of furniture a maker of brass and iron bedsteads is quoted in the New York *Sun* as follows: Although metallic bedsteads match well with almost any kind of furniture in a sleeping room, the metallic craze has extended to other articles. Besides bedsteads, we make metallic bureaus, dressing tables, cheval glasses, shaving stands, towel racks and clothes trees. Parts of the bureaus, of course, have to be made of wood, usually mahogany or oak, and always highly polished. These articles are not likely to come into general use on account of their cost. A mahogany bureau with good brass trimmings costs $140. The trimmings can be attached to any bureau that is handsome enough to support them. They consist of six handles, four cast brass feet, three keyhole escutcheons and a brass cheval frame. Such a set of trimmings sells for $65. A brass dressing table, all of metal but the two oak or mahogany shelves, sells for $50. A cheval glass, 69 inches high, with brass mountings, is worth $70; a brass shaving stand, with polished mahogany drawer, $35; a smaller one $20. Brass towel racks sell for $10, and clothes trees the same. This makes an entire metallic outfit for a bedchamber except the chairs, and there are several firms making ornamental brass chairs.

Palm Oil.

The part played by palm oil in the manufacture of tin plates gives interest to the following information, relating to the production of this material, presented in an export exchange: The export of palm oil and kernels forms by far the largest part of the West African export trade. In 1890 the value of the palm oil exported from Sierra Leone was $13,599 and of the palm kernels £107,827. The tree is more abundant further down the West African coast, and appear to prefer alluvial, often marshy, ground near the sea. It particularly seems to thrive on the rich soil of the mangrove accumulations. There are a large numbers of palm trees in the Mahela district, where a factory once existed, and there are also a considerable number up the Scarcies River and in the lower part of the Limba district. It grows also on low sandstone or gneissose hills, but probably does not produce so much in such places as on the low lying rich alluvials. The palm is propagated from the offshoots that appear at its base, and these are said to begin in the second or fifth year, and are in full bearing about the tenth or fifteenth year. They continue producing for 60 years. A single tree yields from 1 to 3 gallons of palm oil, or, according to Selmer, 16 liters annually, and this amount of oil will give from $\frac{1}{6}$ to $\frac{1}{3}$ hundredweight of kernels. This would be a profit of from 2 shillings to 6 shillings a tree per annum, as about 300 gallons of palm oil give a ton of oil and about $2\frac{1}{2}$ tons of kernels. Hence plantations of these trees should be profitable in time. It is, however, exceedingly difficult to get any trustworthy information, and the above must be regarded as very approximate. The palms require no care, and are not, apparently, attacked by any injurious insects. The preparation is of a very rough and makeshift character; the fruits are thrown into a tank and left till decomposition begins. They are then boiled and afterward pounded in a mortar. Probably 25 per cent. of the oil is lost in preparation.

Sealed proposals will be received until November 9, at the office of the Supervising Architect, Washington, D. C., for all the labor and materials required for the interior finish, &c., including marble floors, plumbing, lathing, plastering, wood stairs, joiner work, wood flooring, marble work, painting, polishing, glass, hardware, approaches, &c., of the United States Post Office building, at Jackson, Mich.. in accordance with the drawings and specification, copies of which may be had from the office of the Supervising Architect, at Washington, or from the Superintendent at Jackson, Mich.

THE RETAIL STORE.

Enterprise New Slaw Cutter No. 94.

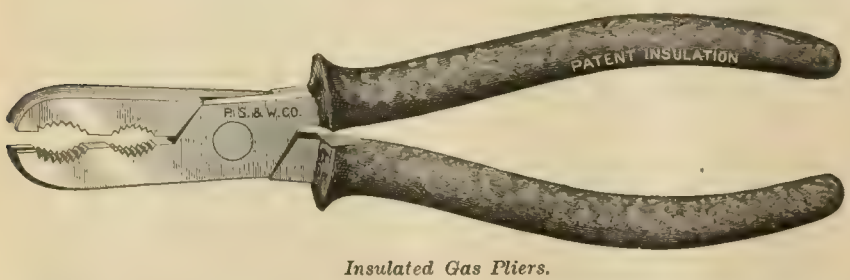
The Enterprise Mfg. Company of Philadelphia, Pa., are putting on the market a slaw cutter, as herewith shown.

Enterprise New Slaw Cutter No. 94.

In operation the article to be sliced is placed on the platform, being fed or pushed gradually against the revolving cylinder, which contains three knives, the sliced product falling into a receiver underneath. The cutter is intended especially for family use, but also for hotels, restaurants, provision dealers, farmers, &c. The manufacturers recommend the cutter for slicing potatoes—Saratoga chips, for instance—onions, cabbage, cucumbers, citron, &c., and for general slicing purposes.

Insulated Gas Pliers.

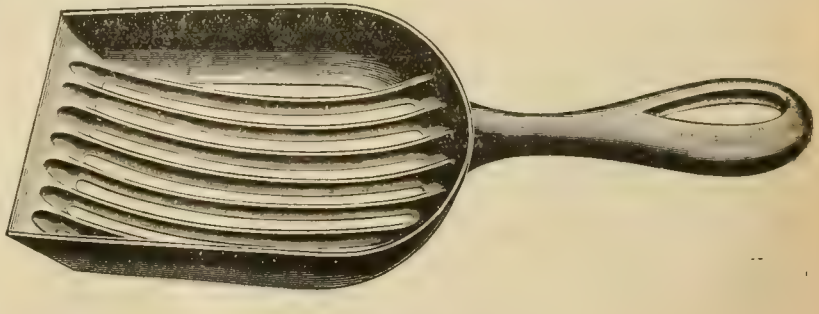
Peck, Stow & Wilcox Company, Southington, Conn., and 27 Chambers street, New York, are introducing insulated gas pliers, as illustrated herewith. The insulation with which the handles are covered is molded mica, mica being, it is understood, one of the best insulators known to modern science. The manufacturers state that the pliers will insulate against 1500 volts of electricity or even more; and that the mica will not chip or come off. The pliers are made in one size—7 inch—and are designed as a protection to those working about gas fixtures which are connected with electric wires.



Insulated Gas Pliers.

Coal Shovel and Sifter.

N. R. Streeter & Co., Groton, N. Y., are offering a coal shovel and sifter, as illustrated herewith. The shovel is made of cast iron, nicely jappaned, 9½ inches long including the handle, and 4⅛ inches wide in the widest place. The openings between the ribs are about $\frac{3}{16}$ inch, making it especially very valuable where pea coal is used. The shovel is designed for removing unburned coal from a stove or range when the fire has gone out, instead of dumping the whole mass, as the coal can be taken from the top of the fire box and sifted without raising dust. The point is made that enough coal can often be saved in this way to run a fire from after breakfast until the fire is needed at noon. The shape of the shovel is such that coal can be taken from between the magazine and the fire pot of a parlor or heating stove, a feature which will be appreciated by those whose fire has gone out with the magazine full of coal. The shovel is designed to retail for 10 cents.



Coal Shovel and Sifter.

Pneumatic Oil Can.

Nail City Stamping Company, Wheeling, W. Va., for whom the Ross & Fuller Association, 33 Chambers street, are agents, are offering the Nail City Pneumatic 5-gallon oil can. The can is made of heavy galvanized iron, to hold 5 gallons of oil, the oil being forced from the can by atmospheric pressure. By pressing down a plunger, the air forces the oil out by way of the spout, and when the pressure is released the oil ceases to flow. The spout, which is curved at the end, is jointed at the can, and when filling a lamp it is turned down to a horizontal position, so that the lamp is filled without lifting it from the table on which the lamp and can stand. The spout is also reversible, and when reversed the can, it is stated, is vapor proof, thus preventing the escape of gasoline or other vapors from the can. The point is made that the absence of a faucet for drawing lessens the liability of the oil or gasoline being tampered with by children.

B. P. Lovejoy has succeeded to the stove business of Cyrus Carpenter & Co., at 44 Hanover street, Boston, Mass.

A course of lectures in metal plate work is a commendable feature of the present season's trade school course at the Borough Polytechnic Institute, London. These lectures are said to have beed found very useful by the students and others engaged in sheet metal work in the British metropolis.

After exhaustive experiments in New York harbor with the torpedo boat "Cushing" to determine the best color to paint such boats in order to escape detection by search lights, it was found that a dull green hue rendered the boat almost indisguishable from the water. A recommendation is to be made to the Navy Department that all torpedo boats should be of this color.

STOVE TRADE NOTES.

Future of the Hot Air Furnace.

By A. W. Glessner,

President of the Excelsior Steel Furnace Company.

LIMITATIONS OF THE HOT AIR FURNACE.

In advocating the use of hot air heating the dealer should not overlook the limitations of the hot air furnace. It is true that the hot air furnace supplies the most admirable form of heating for a very wide range of buildings, including residences, cottages, flats, apartments, stores, audience halls, public buildings, churches and school houses, but there are individual cases where it is not advisable to use furnaces for heating buildings of each class referred to.

Air is a vapor and in this respect is subject to the same rules as the handling of any other vapor and while air can be driven to a certain extent, it has always been found a good policy to coax rather than drive hot air when using the same as a vehicle for the heating of homes and buildings.

Steam is likewise subject to many of the laws that govern the heating by hot air, but is more tractable than is the latter, yet we all know that certain buildings when heated by steam are so much affected by the wind that at certain times one portion of the building will be overheated, whereas another portion will be very cold and it is impossible in cases like this to obtain an equal heat through the entire building with the use of steam.

I have in mind the present moment a building occupied as a school in one of the Eastern cities in which a corridor runs through the center of the building on each floor, and it has never been possible in winter time with the system of steam heating employed to warm the rooms on the north side of said corridor when the wind blows from that direction Students at the college have complained bitterly of the defective heating and not a few have attributed sickness and trouble in after years to the colds and other troubles contracted in the building owing to the defective heating.

The anxiety on the part of the dealer to secure a contract often leads him to overlook the fact that there is a limit to the capacity of the hot air furnace, and also to its capabilities. A great many buildings are so situated that they have long and exposed wings, in many cases facing the north or northwest. Such buildings should not be heated by the hot air furnace, as it would be practically impossible to carry air in the face of a strong wind to the exposed wings. The attempts of dealers and furnacemen to heat such buildings have usually resulted in almost total failure, with the result that hot air heating has been condemned in many towns owing simply to these cases where bad judgment has been exercised by the dealer in attempting to do what was impossible.

SIZES OF FURNACES.

A great mistake has also been made in many places by attempting to make one very large furnace do the work where two smaller ones should have been used. There is a limitation to the sizes of hot air furnaces, much more so than to the sizes of steam and hot water plants, for the reason that hot air can be conducted safely from a distance not exceeding 20 to 30 feet, provided the elevation can be had for the pipe; and where it is necessary to run pipe a longer distance than 20 feet great care should be taken to obtain for these pipes sufficient elevation, and in such cases many pipes when wrapped with asbestos paper have failed to do the work expected of them.

POSITION OF PIPES.

The furnaceman is often called upon to install a job for a party in which pipes are to be run a distance of 15 or 20 feet, and where the elevation from point of bonnet where pipe is taken to the register is less than 12 inches, and in such cases it is likewise almost impossible to obtain effective results owing to the great loss of heat by the radiation of pipes in the basement.

It is often the case when working in country houses that the furnace is to be located in the cellar, which extends under but a very small portion of the house, and in order to reach rooms in various parts of the building it is necessary to tap the cellar wall and convey the air by pipes which pass beneath the floor, and here again there is great danger that the pipes will be so greatly chilled on entering the space without the cellar wall that sufficient heat cannot be carried through these pipes to heat the rooms to a proper degree of temperature no matter how well wrapped the pipes are with asbestos paper.

Such cases as those cited above are met by the furnace dealer in the course of a season's work, and it would certainly be a great benefit to the trade at large if furnaces were not used in the cases cited, or if furnaces are used the owner of the building should be notified in advance of what may be expected, and the guarantees should be withheld on all such work.

Almost every dealer can call to mind cases where he has installed furnaces where hot water or steam should have been used, and where he would have been better off had he the courage to recommend to the owners the use of a system for heating other than hot air.

I know personally of dozens of such cases that have come to my knowledge, and the majority of these furnaces have invariably been taken out and steam or hot water substituted, and in each case the furnace business was injured in the immediate locality through no fault of the furnace, but simply owing to the defective judgment on the part of the dealer. This certainly has a bearing on the future of the hot air furnace, for the reason that each furnace taken out owing to failure to accomplish the work expected of it does great injury to the progress of the furnace business, as the circumstance is taken advantage of by advocates of other forms and methods of heating.

(*To be continued.*)

An Old Base Burner.

A correspondent signing himself "Old Boy" writes us under recent date as follows: In looking over *The Metal Worker* of September 23 I find an illustration of the first base burning stove produced in this country. I at once recognized it as the stove invented by Dr. Mott and which was sold in a store on Water street in New York City. It came under my notice when a boy in 1836. The grate was a basket inverted, and the back flue was on a line with the lower part of the grate. In lighting the fire it was necessary to open a damper in the flue, this damper being about on a line with the feed cover. After the fire was properly started the draft, by closing the damper, was up the flue from the lower part of the grate. This stove was used in all first-class residences in its day, which was before the introduction of steam or hot air, and was first class in all respects.

The Eclipse Stove Company

of Mansfield, Ohio, favor us with a copy of the catalogue which they have issued from the press illustrating and describing their lines of Eclipse stoves and ranges. The volume is made up of 136 pages of letterpress, neatly printed upon good paper and bound in colored paper covers, carrying a gilt side title. In their announcement to the trade the company state that since the last catalogue was issued they have added several new stoves, made a number of additional sizes, and incorporated many improvements, to which the attention of dealers is invited. The first 25 pages of the catalogue are devoted to ranges, the leading place being given to the Grand Eclipse, made in two sizes, for burning wood only. The design is neat, the constructive features of the modern type and the operation claimed to be entirely satisfactory. The Radiant Eclipse, also for burning wood and made in two sizes, is illustrated and described. The cook stoves for burning wood are next considered and occupy something like ten pages. They are made under such names as Pride Eclipse, offered in six sizes, and the Yucatan Eclipse, in seven sizes. Next in order are the coal and wood ranges, including the Brilliant Eclipse, a very neat first-class four-hole construction with ventilated sectional fire back, interchangeable end walls, shaking or dumping grate, large draw out hearth, patent oven door opener and adjustable oven shelf; and the Solar Eclipse, an attractive medium priced construction, made in two sizes and the usual modifications, several of which are shown. The coal and wood cook stoves are known as the Venus Eclipse, made in five sizes; the Superb Eclipse, in six sizes; and the Postal Eclipse, a cheap stove with the modern improvements, offered in seven sizes. The heaters occupy the closing portion of the catalogue, with the Matchless Eclipse leading. This is what the manufacturers call a wood base heater, the bottom flues being along the side of the ash pan instead of under it, and permitting the main body of the

fire, where is the greatest heat, to come nearer the floor. The makers claim that, the heat being compelled to pass around the outside of the base of the stove, brings it where it is most needed and gives a greater radiating surface, with the same amount of fuel, than would otherwise be the case. The store is attractive in its ornamentation and is made in two sizes. A sectional view shows the course of the cold air from the time it enters the stove until it is discharged in a heated condition through openings at the top. The Acme Eclipse is a new direct draft wood cottage stove of tasteful design, and embodies features of construction which are likely to render it popular with the trade. The Star Eclipse, Cosy Eclipse, Total Eclipse and Royal Eclipse are some of the other goods to which attention is invited.

C. M. McClung & Co.

of Knoxville, Tenn., have just issued an interesting publication which is known as Stove Catalogue No. 4. It is devoted to stoves, tinware, grates and house furnishing goods in extensive variety, and in connection with the illustrations are given descriptive particulars which are likely to prove interesting and of value to the trade. Some of the stoves presented include the Favorite six-hole range, made in two sizes; the Atlantic and Pacific wrought steel ranges, made in several varieties; the Improved Excelsior six-hole range, for coal or wood; the Favorite, Virginia Beauty, Excelsior, Leader, Sentinel, Our Mutual Friend and the Southland cook stoves, some of which are designed for burning coal and wood, and others for using wood only. The heaters are represented with the Art Garland square base burner occupying the leading place. Following this is the Foster Oak, the Foster Franklin, the Iron Age, Atlas, Jumbo, Zip, Burnside, Horizontal Oak Franklin for wood only, the Vernon and Buckeye box stoves, together with a line of grates made in numerous styles and sizes. An extensive assortment of hollow ware, stove trimmings, fire sets, stove boards, coal hods, coal vases, corrugated and crimped iron for roofing purposes, water coolers, ice cream freezers, galvanized iron ware, pieced tinware and culinary appliances occupy the closing pages.

ODD PLATES.

THE TAUNTON IRON WORKS COMPANY of Taunton, Mass., resumed operations last week, and the plant is now being operated full capacity in all departments.

"THE STOVE FOUNDERS' NATIONAL DEFENSE ASSOCIATION" is the title of a little pamphlet of pocket size which reaches us from Secretary D. M. Thomas. Its 16 pages are devoted to a statement of what the association is, what it has done and what it aims to do. In connection with these statements is a list of the officers of the association, who are Henry Cribben, president; A. C. Mott, treasurer; W. T. Bradberry, vice-president, and D. M. Thomas, secretary.

THE INDIANAPOLIS STOVE COMPANY of Indianapolis, Ind., are busily engaged in all departments filling orders, and President Bennett is reported to have stated to the representative of a local paper that there were sufficient orders on hand to keep the works going until the holidays.

IN OUR REFERENCE LAST WEEK to the exhibit of the Fuller & Warren Company at the Pure Food Exhibition in the Cyclorama Building, Baltimore, Md., a slight error occurred in regard to the name of the local concern having the display in charge. The firm name should have read A. W. Martin & Co.

WE ARE INDEBTED to Fletcher, Russell & Co., Limited, Warrington, England, for a copy of their list No. 175 of gas heating appliances. The volume bears date of September of the present year and consists of 126 pages of letterpress, profusely illustrated, and giving an idea of the extensive assortment of gas burning appliances manufactured by the company. A part of the volume is a supplement bearing date of October, and showing a new pattern of range which the makers have added to their lines of cooking apparatus. The new range is decorated in a neat and attractive style, and has the broiling device raised slightly above the top of the stove instead of being placed below it, as is the case with gas stoves of American manufacture. The range stands 33½ inches high, is 22½ inches wide and 20½ inches deep. It has a double case and is jacketed with slag wool, patent removable linings, enameled with porcelain, being furnished when so ordered.

I. F. GRUMBEIN, local agent at Lebanon, Pa., for the Howard Furnace Company, is placing the company's system of heating and ventilation in the new Keystone Bank building at Manheim, and also in the school building in Pennsylvania Township, Lancaster County, Pa.

THE ART STOVE COMPANY of Detroit, Mich., are meeting with a very gratifying demand for their specialties, and state that the volume of trade is steadily maintained, while the general depression seem to be wearing away. They have issued an illustrated circular of their Oakland parlor stove, designed for burning hard coal, soft coal or wood, and which is made in four sizes. It is of attractive appearance, and is referred to by the makers as perfect in all respects. They state that "the merit of this stove has won it success." The circular also shows by circles of solid black the volume of business during the last ten years, and they expect that next year they will have a much larger black spot to record than the one for 1892.

THE HUETTE-BARLER MFG. COMPANY of Chicago have issued a little pamphlet entitled "A Reason Why," which is a work of art. It treats of the special merits of Barler's Ideal oil heater, put in the form of a narrative by a World's Fair visitor who has seen the company's exhibit of oil heaters in Section O of the Manufactures Building. The story is well told and contains many excellent points. The pamphlet is profusely illustrated, beautifully printed and has an illuminated cover.

THE BOARD OF DIRECTORS of the Lebanon Stove Works, Lebanon, Pa., held a meeting on October 7, at which H. H. Kreider was elected president of the company, to succeed the late Adolphus Reinoehl. By the action of the Board of Directors J. M. Reiley was made general manager of the company from October 1.

THE MICHIGAN STOVE COMPANY have issued a capital advertising wall picture in colors and bearing the title, "A Model Stove and a Model Husband." A woe-begone man is trying to pacify two children, while his wife, who is in street dress, is represented as saying to him "Good by, dear, mind the children and put them to bed. The 'Garland' will take care of itself." And the Garland base burner standing near either glows with pride at the compliment or reddens with shame at the shrinking, henpecked husband, we are not sure which. Another novel advertising device is a muslin backed card which begins, "This cloth is not all wool and a yard wide," and then follows a glowing tribute to the excellence of Garland stoves and ranges.

A HARDWAREMAN said this morning: "If you want to know who people are and how they live look at their kitchen stove," as he tried to pick up one side of one that had just been brought in for repairs and it slipped out of his hand. "There is oil enough on that hearth to furnish greased pigs for a year's tournament. As for blacking, the stove never saw it," and he wiped off his hands as he sat down to meditate.

THE CARTON FURNACE COMPANY, 83 and 85 Wabash avenue, Chicago, are to furnish six Carton furnaces for school buildings at Clinton Junction, Wis., and two for Alexis, Ill.

SOUTHARD, ROBERTSON & CO, Peekskill, and 21–25 Peck Slip, New York, have just brought out the Waldorf range, made both right and left hand, and either portable or brick set. In it have been combined what appear to be many admirable features, the design being such as to enable the intelligent cook or housekeeper to have at all times complete control of fire, draft and oven temperature. There is a new compensating device for controlling the intensity of the flue current. The range has six covers and the size is 8–20. It can be had with regular or skeleton hot closet, flat or rocking grate and with or without ash sifter. In the collar box is a Read's patent damper, the rod of which is removable without disturbing the top. Both grate and water back may be replaced without interfering with the bricks. One hole is fitted with three rings, affording a 3, 6 or 8 inch hole for different utensils when direct contact with the fire is desirable. The oven door has a swell front extending outward about 2 inches. This can be opened with a kicker, nickeled to correspond with other minor parts. At the lower left hand corner of the oven door is a circular ventilating draft wheel, to be used in connection with a slide at the upper right hand side of the interior of the oven, for modifying the temperature when baking, if desired. A slide attachment in bottom of oven for shortening or lengthening the flue plate operates to restrain or increase the chimney current, according as it is too much or too little. The brick set range can be set from 8 to 12 inches in a 33-inch jamb.

MEISTER & ROHRER of Sterling, Ill., held a baking reception on Friday and Saturday, the 13th and 14th of the present month, sending out something like 1200 invitations. The baking was done in a Monarch Peninsular range, and was a great success in every way. A large number of those to whom invitations were extended were present, and we are told that there were consumed over 300 dozens of biscuit.

AUGUSTINE C. WEST of Cambridge, Mass., has patented an oil stove in which the object sought is to decrease the cost while producing a device free

from the objectionable features of sweating and heating of the oil tank and burner. The oil stove is supported upon a wooden shelf forming a base and having a metallic plate on its upper face. From the under face the oil reservoir is suspended. The wooden shelf has one or more openings for the cylinders or heating bodies of the stove. A one-half interest in this patent has been assigned to Page Brothers & Co. of Boston, Mass.

THE HOWARD FURNACE COMPANY, with main office and factory at Syracuse, N. Y., are distributing among their friends a little folder telling of the merits of the Howard heater. It winds up with the request that if the reader is interested and cares for more information, or desires an estimate for heating, to address the manufacturers or any of their authorized agents in New York, Boston, Mass., Grand Rapids, Mich., and Toronto, Canada.

AT THE LAST CONVENTION of the National Association of Stove Manufacturers, held on June 1 in Chicago, numerous papers were read dealing with subjects of interest and value to members of the trade. One of the papers, written by special request and read before the national body, was that presented by Lazard Kahn of Hamilton, Ohio, on "The Stove Industry and the Ethics of Consolidation." This paper has recently been published in pamphlet form and is now being distributed among members of the trade.

A MONTREAL, CANADA, DISPATCH of October 19 states that the establishment of William Glendening & Sons, founders and stove manufacturers, of that city, was the scene of a fire which occurred on Thursday last, causing serious damage.

LEWIS M THATCHER, secretary of the Thatcher Furnace Company, 33 Peck slip, is at present absent from the Metropolis on a business trip through the Western States. We understand that he is meeting with a hearty welcome by the dealers, and that he has booked a number of very gratifying orders. One of the latter, which he has sent in, comes from Chicago and calls for 25 furnaces and 20 ranges; another from Indianapolis calls for 20 ranges and 15 furnaces, and some from St. Paul and Minneapolis aggregate 40 ranges and 50 furnaces. He has written the home office that he will continue his trip to Denver.

THE FRONT RANK STEEL FURNACE COMPANY of St. Louis, Mo., are constantly in receipt of testimonial letters referring to their Front Rank furnace. Among those recently received is one which was sent to a prospective customer by Frank Wyman of the Simmons Hardware Company and reading as follows: "In regard to the Front Rank furnace, would say that in my new house I have placed two of them. A great many of my neighbors have them, and I have yet to hear the first word against them. I do not know that they are any more economical than any other furnace, but I do know that they are no more expensive in the amount of coal they burn, while the heat they give is pure, fresh hot air sent up into the rooms in a healthy condition. They have what is known as a cold air box which furnishes air to the furnace and is then sent up into the house, heated fresh air, instead of burning up the oxygen which is in the room. The company are at present rushed to death with orders and are just as busy as they can be, so if you want to order a Front Rank you had better do so at once."

THE NEW ELECTRIC PLANT which the Thatcher Furnace Company of 33 Peck Slip, New York, have recently installed in their foundry at Newark was tested on October 15 with very satisfactory results. We understand that the works are fitted with 250 incandescent lamps, which present an exceedingly brilliant appearance when lighted. The test was conducted under the immediate supervision of Edward Benedict, treasurer of the company.

WORLD'S FAIR NOTES.

The Keasbey & Mattison Company

of Ambler, Pa., have an exhibit in Section D of the boiler house annex, Machinery Hall, where they have erected a neat and serviceable platform, around the outer edges of which showcases have been built containing specimens of their magnesia sectional steam pipe covering. It is composed of magnesia and asbestos and is intended for all manner of steam pipe, both high and low pressure, and also for boilers. It is further available for connections and fittings separately.

The Joseph Dixon Crucible Company

of Jersey City, N. J., have erected a very artistic *façade* of cherry and mahogany to mark the boundary of their space, which is richly furnished with fine carpet and handsome show cases, while numerous chairs have been provided for the hospitable reception of visitors. Arranged in the showcases are products of graphite in many forms, such as crucibles and silver and gold retorts, from No. 0000 up to No. 300, dippers, bowls, stirrers, nozzles, stoppers, electrical appliances, forms for incandescent lights, electrotypers' facings, founders' core wash, foundry facings, shot glazing, graphite lubricants, machinery oil, cylinder oil, inside and outside grease, dry lubricants, roof paint, boiler and smoke stack paint, yacht graphite, hatters' lead, pigment for paint, flake graphite, &c. These exhibits are in many instances arranged in glass jars, with richly enameled labels. One showcase contains specimens of graphite in special shapes, such as great bunches of pencil leads in all shapes and thicknesses, and resistants for electrical purposes in bars, coils, rings, rods, &c. On a mahogany table stands a Dixon crucible which was used at the American Bronze Works, Grand Crossing, Ill., in casting the solid silver statue of Justice for the Montana display in the Mines and Mining Building. The finest specimen of graphite ever mined, according to experts, is here exhibited, and an award has been granted the company on that ground. It weighs 269 pounds, and is said by mineralogists and chemists to be at least 98 per cent. pure. It was mined on the island of Ceylon. Numerous other specimens of graphite are shown which run up to almost 100 in fineness. The company's graphite is principally obtained from their own mine at Ticonderoga, N. Y. So little is known of graphite by the general public that the company's representative in charge of the exhibit, John H. Baird, may be said to be delivering a perpetual lecture on this useful mineral to a stream of visitors. The special lead pencil display of the Jos. Dixon Company is located at Column F 98 in the northeast gallery of Manufactures Building. It occupies a small space, but the exhibit is nevertheless a very fine one. Samples of lead pencils in almost every conceivable shape and size are tastefully arranged on a four-sided frame in a handsome glass showcase. Returning to the Mines and Mining Building, another exhibit in the east gallery worthy of mention is that of

Robert J. Taylor & Son,

Nineteenth and Callowhill streets, Philadelphia, who show a great variety of crucibles and retorts for all purposes. These are arranged on a set of shelves, receding from very wide ones at the bottom to narrow ones at the top, to accommodate the different sizes of crucibles. A much larger display, however, in the same line is that of the

Phœnix Crucible Company

of Taunton, Mass., who have erected a great pyramid of shelves, crucibles of all sizes completely covering the four sides. Banners prominently displayed state that this is the oldest incorporated crucible manufacturing company in the United States. A large gilt phœnix surmounts this exhibit. In close proximity is the display of

The Tanite Company

of Stroudsburg, Pa., which can be best described by quoting from a circular prepared by this company. They were requested by the exposition authorities to treat "abrasives" from an educational standpoint. The exhibit here illustrated and described is the result, and its compact character is due to the fact that the exhibit will be presented as a gift to the Smithonian, the Chicago University, or some other suitable institution. While some of the articles were furnished by the Tanite Company many were contributed by liberal minded manufacturers.

Emery, being the most important abrasive, is illustrated fully. Emery ore is shown from Turkey, Greece and the United States. In one piece clear blue sapphire can be seen with the naked eye. On a platter of pure aluminum are shown sapphires, corundum and emery, with the explanation that alumina is the oxide of aluminum, and that the articles on the platter are largely composed of crystallized alumina, the sapphire being almost pure alumina. Emery is then shown in its successive stages—first as it comes from the crusher; then in the form of grain and flour; then as polish (powder, liquid and paste); and, lastly, in the shape of whetstones and solid emery wheels. Fragments of various classes of Tanite wheels are displayed to show the internal texture. There are bottles containing the dust gathered under Tanite wheels after the grinding of cast, malleable and wrought iron, and of brass and steel. These are for experimental examination with magnifying glass and magnet. "Petrified sparks" are an interesting feature. These are strangely shaped cones formed of the matter which fuses below an emery wheel when grinding under heavy pressure. The comparative products of the emery wheel, file and cold chisel are tabulated on a framed sheet, while the case contains pieces of cast iron and saw steel with the cuts made by file and wheel. The piece of saw plate demonstrates that in a given time the wheel did 126 times as much work as the file. In the case and on the ends of the stand are numerous parts of machines, all of which have been surfaced by the Newman emery plater. These appear to be as true as if planed, and

tabulation shows that this machine has taken a maximum cut ¼ inch deep, and has taken a $\frac{1}{16}$-inch cut over a surface of 100 square inches in six minutes and nine seconds. Its ordinary cut is from $\frac{1}{64}$ to $\frac{1}{32}$ inch.

Emery wheels are usually thought of in connection with metal grinding, but in this case are shown blanks for long combs and ladies' back combs, made of vulcanite, and other samples showing that the long comb has been edged and the back comb had the spaces between the teeth cut out with Tanite wheels. Glass guides from a silk spinning mill are also shown. In these guides the silken thread wears a tapering groove which eventually breaks the thread, and these grooves are ground out by the use of Tanite wheels.

As curious and instructive examples of abrasion, the parts of various machines used in the Tanite factory are shown, all testifying to unequal and destructive wear due to unequal stress and the friction of emery dust.

Samples of carbon or black diamond and also samples of clear or gem diamond, suitable for turning or dressing emery wheels, are shown by the Tanite Company. The evolution of razors and table knives is shown in two series of samples, beginning in each case with the rough ingot or blank of steel, progressing through various stages of polish to the final bright finish.

An interesting series of photographs shows emery veins and mining processes in Westchester County, N. Y.

After showing how wide a range of materials and processes is covered by this compact and unique exhibit, we can close in no better way than by referring to two pictures: One of these seems to represent the tail of a comet, though what is really shown is the stream of fiery sparks streaming off from a Tanite emery wheel while engaged in grinding through a file. The other is a photograhic reproduction of a picture in the Royal Gallery, Berlin. The photograph was contributed by Markt & Co., Hamburg, and the painting was by Gerard Ter Borch, who was born in Holland in 1617. This painting represents with much detail "The Grinder's Family," and depicts clearly the rough and primitive grinding processes then employed.

The many articles already mentioned form only a part of this exhibit; but enough has been said to show how much unexpected interest, even for the unlearned, may be found in an exhibit whose name suggests nothing but a dry, hard, technical study.

H. W. Johns Mfg. Company

of New York, Chicago, Boston, Philadelphia, Atlanta, Jersey City and London, have six exhibits of their specialties, owing to the variety of claims covered by their productions. In the Mines and Mining Building they have machinery in operation manufacturing asbestos fabrics, on the ground floor in the northeast corner of the building, Section Q. In the same building, in the northeast gallery, Section T, Column 11, they exhibit a collection of asbestos minerals from all parts of the world. In the Electricity Building, west gallery, Section U, they show insulating materials for electrical purposes, vulcabeston, &c. In Machinery Hall asbestos pipe and boiler coverings are in actual use. The feed pipes for 70 engines and about 50,000 feet of main steam supply pipes are covered with asbestos sectional coverings. In the great Manufactures Building paints are shown on the ground floor in the northwest part of the building, Section H, Block 1, while the general exhibit of the manufactures of the company is located in the gallery in the northeast corner, Section F. This last exhibit covers an enormous variety of asbestos goods, such as drop curtains for theaters, fire proof building paper, gaskets for pipe joints, pipe coverings, &c.

The Electrical Forging Company

of Boston, Mass., make one of the most novel exhibits at the exposition. The operation of heating and working metals by electricity on the Burton system is shown on quite a comprehensive scale in Electricity Building, Section D, Space 2, in the northeast quarter of the building. Appliances for forging, welding, rolling, brazing and for rolling balls and taper pins are in regular operation. One of Merrill Bros.' large drop forges is used for the manufacture of miniature horseshoes, which are in eager demand by spectators for souvenirs. Everything is done by electricity, the machines being operated by an elecric motor. A large electric heater with several metal holders is used for heating bars for forging, rolling and welding, also for welding tubes or pipes. This heater is so governed by a regulator or rheostat that pieces of different diameters and varying lengths are heated at the same time, the heater dividing its current automatically. Iron or steel or copper can be heated easily and in a remarkably short time. The holders for heating bars to be rolled into balls are located close to the rolling machine. There are four of these holders, so that the operator can be kept supplied with heated rods. The metal thus heated is not oxidized, and the most ignorant workman is in no danger of burning it. Experiments of many kinds were made in the presence of the writer to demonstrate the remarkable mildness of the heat thus applied. A striking peculiarity of the heated bars is that at a white heat the part of the metal not exposed to the electric current is quite cold within a very short distance of the heated portion. A portable heating apparatus is shown, which is adapted for use in heating rivets in the construction of buildings or in other isolated locations. A bucket containing water is connected with one pole of an electric current, which may be taken from an electric light, a trolley wire or other convenient source of electric energy. A pair of tongs is connected with the other pole. A piece of metal held by the tongs being dipped in the water the circuit is completed and the metal at once begins to heat. It will melt if kept in the water any length of time, the action being very rapid. A jacket of hydrogen, it is explained, is generated which envelopes the metal and protects it from the action of the oxygen, so that the iron or steel is not injured by the heat as applied in this manner. A piece of steel held in the water until the end fused was found to be unburnt after it was allowed to cool. A medal and diploma have been awarded this exhibit "for originality, rapidity in placing and removing the metal to be heated and adjusting the heating devices to varying sizes, shapes and lengths, and for original and superior construction and apparatus."

Franklin Brass & Bronze Company have about finished a new factory at Derby, Conn., which they expect to occupy and operate the latter part of this month. They will manufacture the same class of goods formerly made by the Franklin Brass Company, at their factory in Buchanan, Va., destroyed by fire two years ago, soon after starting up. They now have at Derby a well equipped plant for producing Refrigerator and Box Trimmings, Hinges for water closet seats, Hasps, Door Numbers, Molding Hooks, Cabinet and Builders' Hardware, Escutcheons and Shutter Bars, Flush Lifts, Brackets, Cabinet Hinges and Butts. They expect to increase their line of builders' hardware largely. They have a foundry also for casting special goods to order, and will make this department a feature of their business. W. F. Brainerd will be in charge of the business at 111 Chambers street, New York.

Fire Proofing with Mineral Wool.

We quote the following from a paper by R. Gordon Hyndman, read before the Royal Victorian Society of Architects:

My partner (Mr. Bates) and I have made a number of experiments as to the fire resisting qualities of this substance (mineral wool), and so satisfied were we with the results that we determined to use it for the fire proofing work at the Australian Mutual Provident Society's offices in Collins street. In this case we had a somewhat awkward problem set us. We had to fire proof the whole of the ceiling of the new main office, and also the attached board room and accountant's room, without working from the top, disturbing the floor above, or in any way inconveniencing the tenants who hold offices on long lease from the company. This being so, we had to find some fire proofing that could be put in position from below, and put up dry (the ceilings and walls having to be decorated at once), and of no great weight or cost; and, last but not least, a material that would satisfy the building referees. As I said before, after experiment we decided to make use of silicate cotton, if allowed by the building referees. I am glad to say that by practical demonstration we were able to satisfy these gentlemen as to the fire resisting qualities of the material, and obtained their consent to the method of using it, which I am about to describe. In the old office building the first floor joists were supported on 10 x 5 inch rolled iron joists running from wall to wall (a span of about 30 feet), the ceiling joists of the main office being supported on the lower flanges of the joists, and on these ceiling joists a lath and plaster ceiling of the ordinary construction was formed. In order to form the new fire proof ceiling we removed the lath and plaster ceiling and wood ceiling joists, and inserted new 5 x 4½ inch rolled steel joists between the old 10 x 5 inch rolled iron joists, and carried the whole on a new set of girders, and then on the lower flanges below the iron and steel joists we placed buckled boiler plate, 3-16 inch, and in the space thus formed inserted a packing of the silicate cotton, The new ornamental ceiling below is formed of fibrous plaster. I do not for a moment suppose that as a fire resisting floor this iron and silicate cotton construction can compete with iron and coke concrete, or iron and terra cotta, as to effectiveness or price in ordinary cases; but I feel sure that, given conditions such as we had, you will find it difficult to obtain any fire proofing more easily handled, effective, and, last but not least, that will satisfy the building referees of the city of Melbourne.

TRADE REPORT.

The Iron Market.

The best that may be said is that the past week has not brought any more particularly unfavorable developments in the Iron trade proper. Like every other industry and business throughout the country, it is suffering from the failure of the Senate to put our currency question into proper shape. With admirable patience the business community has suffered without displaying more than pardonable exasperation. We do not believe that this phase will last much longer. It will take, but a small impulse to bring about the ears of the Senators a cyclone of wrath from the business world which will put an end to dallying. It will be made apparent who are the masters and who are the servants.

Every day's delay pushes further into the future the prospects of a recovery. Every day's delay drags nearer to the brink of bankruptcy many merchants and manufacturers. It is steadily sapping the vitality of the strongest. Business men not only owe it to themselves but to their employees to adopt vigorous measures. When the threatened bread riots come this winter, with their loss of life and of property, they will not be quite free from their share of blame, since they have not yet exhausted their power of coercion.

From the majority of the Iron trade centers comes the same talk of discouragement. In isolated cases there are reports that a moderate volume of business is coming up, but orders which would hardly cause comment in ordinary times are eagerly pointed to now as offering some encouragement. The Iron trade needs the immediate repeal of the purchasing clause of the Sherman act, and wants peace for a long time after that.

Pig Iron.— The New York market continues featureless and exceedingly dull. We quote Northern brands $14 @ $15 for No. 1; $13 @ $14.25 for No. 2, at tidewater. Southern Iron, same delivery, $13.25 @ $14.25 for No. 1; $12.25 @ $13.25 for No. 2; $11.50 @ $12.25 for No. 3; $11.75 @ $12.25 for No. 2 Soft, and $12.25 @ $12.50 for No. 1 Soft.

In the Philadelphia market the feeling is reported as exceedingly dull. Prices are weaker and lower, yet with a production of only 40 % of what it was a few months ago, there is more unwillingness to buy than when prices were very much higher and production twice as large. There is no disposition to buy anything that is not actually needed, no matter what inducement may be offered as regards prices. The usual quotations are about $13 @ $13.50, delivered, for No. 2 Foundry, and $14 @ $14.50 for No. 1. Southern Irons can be had at less money, several lots having changed hands at $11.50 @ $11.75, with a fair chance that orders could be readily placed at the same or slightly lower figures for good sized lots and prompt settlements.

Only a few sales of fair importance are reported from the Chicago district. Among these were 500 tons Southern Coke Foundry, 500 tons Lake Superior Charcoal, 300 tons local Coke and a few 100-ton lots. Carload orders have been fair but not very numerous. Some Iron houses reported the past week as one of almost complete stagnation with them. Shipments of Coke Iron from the furnaces are steadily increasing, largely on account of the growing consumption of agricultural concerns. Some little improvement, however, is noticed in the consumption by general foundries. Quotations are given as follows for cash:

Lake Superior Charcoal.....	$16.00 @ $16.50
Local Coke Foundry, No. 1...	13.50 @ 14.00
Local Coke Foundry, No. 2...	12.75 @ 13.00
Local Coke Foundry, No. 3...	12.50 @ 12.75
Local Scotch.....	14.00 @ 14.50
Ohio Strong Softeners No. 1..	15.50 @ 16.00
Southern Silvery, No. 1.	@ 14.50
Southern Silvery, No. 2.....	@ 14.00
Southern Coke, No. 2.....	12.35 @ 12.60
Southern Coke, No. 3	11.60 @ 11.85
Southern, No. 1, Soft.....	12.35 @ 12.60
Southern, No. 2, Soft.....	11.85 @ 12.10
Tennessee Charcoal, No. 1...	16.00 @ 16.50
Alabama Car Wheel.....	18.50 @ 18.75
Hocking Valley, No. 1	15 25 @ 16.00
Jackson County Silvery.....	16.00 @ 17.00

The Pittsburgh market is described as a waiting one, and although buyers are aware of the fact that furnaces are offering their product at about cost, or perhaps below, orders continue to come in for immediate requirements only. Production in that district has been increased to the extent of about 250 tons per day by the blowing in of the stack of the Monongahela Furnace Company, at McKeesport, on Mill Iron. For ordinary lots asking prices are $12.50 @ $13, cash, for No. 1 Foundry and $11.50 @ $12 for No. 2, on the same basis.

There has been very little change in the general features of the Southern Pig Iron markets during the week; the transactions have been restricted to supplying the current wants of the jobbing foundries and the stove works, but the purchases of the latter are not large, seldom running over 200 tons at any one time, and frequently much less; there has been no large demand for forward delivery, and while the stronger Iron companies in the South are not urging sales, and, in fact, have withdrawn from the market, because they have sold as far ahead as they care to, yet there are indications that almost any kind of Pig Iron could be bought for spot cash about as low as it has ever sold in a regular way, although it seems certain that there is no margin of profit in its manufacture. Quotations are as follows:

Southern Coke, No. 1.	$12.75 @ $13.00
Southern Coke No. 2.....	10.75 @ 11.00
Southern Coke No. 3.....	10.25 @ 10.50
Ohio Soft Stone Coal, No. 1....	15.50 @ 16.00
Ohio Soft Stone Coal, No. 2....	14.50 @ 14.75
Lake Superior Coke No. 1.....	15.00 @ 15.25
Lake Superior Coke No. 2.	14.00 @ 14.25
Hanging Rock Charcoal, No. 1..	18.50 @ 19.00
Hanging Rock Charcoal, No. 2..	17.50 @ 18.00
Tennessee Charcoal, No. 1.....	14.00 @ 14.25
Tennessee Charcoal, No. 2.....	13.00 @ 13.25
Standard Southern Car Wheel	17.75 @ 18.00
Lake Superior Car Wheel and Malleable.....	17.00 @ 17.25

Metal Market.

Pig Tin—Comparatively little Tin has changed hands in a speculative way during the past week, but the market has gained somewhat in tone, although purchases by distributors and consumers have been on a rather moderate scale. Straits shipments during the first half of the month, it was advised, amounted to 1450 tons, including 1125 tons to Great Britain and 325 tons to the Continent, against 1275 tons during the corresponding period last year. Some few lots have been sent from Europe to this market, but not enough to have any decided influence upon the situation here. Bids were raised on Tuesday to 20.90¢, net cash, for prompt or current month delivery, but at the close of the week the buying spirit was exceedingly tame, and bids above 20.80¢ were strictly the exception. The retail demand for Pig Tin is very moderate, and quotations for small lots remain unchanged at 22¢ for Straits and 22½¢ for Banca.

Copper.—Exports continue liberal, and deliveries on home trade orders are fairly large. Between the two a considerable portion of the product of various concerns has been taken up, and with general trade conditions in better shape than they are at present the market would probably show stronger tone. It happens, however, that there is more than enough Copper to go around, and prices are soft in consequence, although showing no radical change. In remote instances 10¢ is quoted for Lake Superior Ingot, but there have this week been more sellers than buyers at 9¾¢, and rumor had it that sales were made at as low as 9⅝¢, net cash. It was rumored that some sales of ordinary casting stock have been made at 9½¢ on net

cash terms. Jobbers report orders and inquiries to have fallen off materially in volume during the past two weeks, and the impression prevails that little improvement may be expected until the currency question is settled by Congress. Prices for small lots of Ingot, although nominally unchanged, are inclined to weaken.

Sheet Copper.—The market has relapsed into dullness, nothing but a hand to mouth trade being done. No immediate prospect of any improvement is in sight, or is looked for until general business revives again, and some impetus is given to the roofing and cornice trade and other trades using Sheet Copper. Prices remain unchanged, as per list.

Pig Lead.—There has been a further decline in prices and the market has had a depressed appearance. Consumers purchased indifferently, while other buyers virtually did nothing. At from 3.50¢ down to 3.30¢ probably 500 tons changed hands, with 150 @ 200 tons at the lowest figures. With Western markets quite as low, relatively, the position at the close was the reverse of encouraging. Bids of over 3.25¢ for carload lots delivered here were strictly the exception. At 3.35¢ the offering was fairly free at the close. Jobbers' prices for small lots are quoted a shade lower at 4⅛¢ @ 4¼¢ for American Pig, with little business doing.

Lead Pipe and Sheets.—The market for manufactured Lead remains dull and featureless. Demand for Plumbers' Supplies is of the narrowest, owing to the inactivity existing in the building trade. Collections are reported as good, comparing favorably with those of previous years. New York retail prices for Sheet Lead and Lead Pipe remain unaltered, as per list.

Spelter.—Prices for ordinary Western brands have fallen about 0.20¢, or to about 3.55¢ @ 3.60¢. This brings the cost of the metal down to an unusually low point, and, according to most calculations, leaves very little, if any, margin of profit to producers. Despite this, it does not appear that either consumers or dealers manifest any inclination to buy except as imperative wants necessitate, and exporters are not doing enough to relieve the situation. Hence a rather demoralized market and little chance of improvement in the immediate future, unless production be curtailed considerably.

Antimony.— For ordinary jobbing quantities there has been a fair demand, but the market is otherwise slow and prices are easy. We quote for small lots at 10¼¢ @ 10½¢ for Hallett's, and 11¢ for Cookson's.

Sheet Zinc.—The market for Sheet Zinc continues without change. The exceptionally low prices which are now ruling are due principally to the low price of Spelter and the inactivity of both the Spelter and Sheet Zinc markets. The demand for Sheet Zinc is, however, somewhat stimulated by the reduced prices which are now prevailing, but the trade are not disposed to purchase much beyond their early requirements.

Tin Plates.—Ordinary Cokes continue in very fair demand, and sufficient business has been done in these Plates, both for prompt and future delivery, to keep prices quite firm. Business in Bright Charcoal and Ternes has fallen into a narrow, hand-to-mouth groove, with only moderate inquiry. Prices for these lines of stock are consequently softer, but without radical change. Futures continue almost entirely neglected. Stocks in the hands of dealers are very moderate, yet they appear to be amply sufficient for present narrow requirements.

Sheet Iron.—A fairly active demand continues for Galvanized Sheets. Owing to the restricted output of this material, however, jobbers have considerable difficulty in getting mills to fill their orders promptly, and some scarcity already exists, which with any marked revival of trade would be apt to develop into a veritable famine of Galvanized Iron. Prices, nevertheless, continue unchanged. Black Iron is in fair demand, the Charcoal quality being reported in greater favor than Common Iron, owing to the reduction in price, which has placed so comparatively small a difference between the two kinds that consumers willingly pay a little more to obtain the better quality. Prices for Black Iron are firm, the demand being nearly on a parity with production.

The American Well Works of Aurora, Ill., have secured a medal for their revolving process machine, by which wells are sunk by the revolving of the tubing and a stream of water washes out the borings. The deepest and largest wells sunk in alluvial formations, quicksand, &c., have been sunk with it. J. W. Byrnes & Co. have sunk a well with it at Galveston, Texas. It was commenced with 22-inch bore, and is sunk to a depth of 3067 feet in quicksand and clay, with alternate strata of hard materials.

The Homer D. Bronson Company, Beacon Falls, Conn., make a specialty of fine Art Metal Work of electro bronze from architects' drawings, models, carvings, &c., for interior decoration of all descriptions, including panels for dadoes, friezes, doors, mantels, sideboards, houses, steamboats, palace cars, furniture, pianos and organs, billiard tables, &c. The company have just completed a quantity of ornamental bronze work finished in gold for the Columbus Building, Wabash avenue, Chicago, from architect's designs. In addition to the above work the company manufacture wrought brass Butt Hinges, finely polished and plated Piano and Organ Hinges, Continuous and Sectional Hinges for every purpose, any width and length, fancy and irregular shapes to order, wrought brass Pressure Bars and brass goods in general.

The Peck, Stow & Wilcox Company's main factories, at Southington, Conn., are again in full operation.

Chicago Report.

Scrap.—The demand for Old Material is still very light. An occasional sale is reported, and at long intervals some consumer takes a round lot, but generally trade is extremely dull. Dealers furnish the following list of buying prices, Chicago delivery:

	Per net ton.	Per lb
No. 1 Wrought Scrap	$8.00	....
Machinery Cast	7.00	....
Malleable Cast	6.00	....
Stove Plate (free of burnt)	5.00	....
Burnt Iron and Grate Bars	3.50	....
Sheet Iron and Hoops	2.00	....
Plow Steel and Breaking Stock	5.50	....
No. 2, such as Shovels, Hoes, &c	4.00	....
Old Boilers—whole (Iron)	4.00	....
" (Iron)—cut in single Sheets and Rings	6.00	....
Old Gas-Pipe and Boiler Tubes	5.00	....
Cast Borings	3.25	....
Turnings	4.00	....
Horseshoes	9.00	....
Copper Bottoms	....	5 ¢
Copper Clips and Heavy	....	7 ¢
Heavy Brass	....	5⅛¢
Light Brass	....	3½¢
Pipe Lead	....	2½¢
Tea Lead	....	2 ¢
Zinc	....	2 ¢
Rubber	....	2¼¢

Anthracite.—Dealers report a much heavier demand, but stocks here are so small that difficulty is experienced in filling orders. Those who did not buy early in the season are now likely to be put to much inconvenience. Carload lots of 12 net tons or over are quoted as follows:

	Grate.	Egg, Sto. and Ch.
Chicago, Ill	$5.85	$6.10
Milwaukee, Wis	5.85	6.10
Kansas City, Mo	9.05	9.30
Council Bluffs, Iowa	9.05	9.30
Lincoln, Neb	9.20	9.45
Sioux City, Iowa	9.05	9.30
Aberdeen, S. Dak	9.10	9.35
Dubuque, Iowa	7.15	7.40
Madison, Wis	7.35	7.60
St. Paul, Minn	8.35	8.60
Burlington, Iowa	7.35	7.60
Des Moines, Iowa	8.80	9.05
Davenport, Iowa	7.15	7.40
St. Joseph, Mo	9.05	9.30
Leavenworth, Kan	9.05	9.30
Omaha, Neb	9.05	9.30

Colorado Anthracite.

COLORADO FUEL & IRON COMPANY.

Denver	$8.00
Pueblo	8.00
Colorado Springs	8.00
Leadville	8.00
Cheyenne, Wyo	10.00
All points between Denver and Missouri River	9.35

The Hollands Mfg. Company, Erie, Pa., have issued a neat advertising novelty which they are sending through the mails to their many friends in the trade. It is in the shape of an ornamental folder, gotten up by Livermore & Knight of Providence, R. I., and bearing on the address side "Forewarde Quicklye—Thys Lettre beareth Tidynges of Greate and Exceedinge Value." Upon opening the folder we find one page devoted to an illustration the central feature of which consists of some of the company's specialties. Standing about in various attitudes are numerous "Brownies," which Palmer Cox has made famous, while three of the little imps are manipulating a Vise. Opposite the picture are lines telling of the merits of the Chucks, Vises, Stocks, Dies, Pipe Wrenches and tools generally which the Hollands Mfg. Company are offering the trade.

CONDITION OF THE

Hardware Trade.

BUSINESS on the whole shows little or no improvement during the past week. Some houses report a fairly active trade, but most jobbers and manufacturers do not give quite so favorable advices. There is certainly an important diminution in the volume of business this season as compared with last year. Seasonable goods are most active, but a good deal of complaint is made concerning the lateness of trade, which is, perhaps, explained in part by the fact that exceptionally fine weather has generally prevailed. It is not thought, however, that even in these lines the volume of business will be up to the average. Prices are, with a few exceptions, without change, but the undertone of the market is not strong, and it is expected that if present conditions continue there will be a tendency toward lower values.

Advices from Chicago.—The Shelf Hardware trade has fallen off again, very much to the discouragement of jobbers, who hoped and expected that the improvement noted last week would continue. It seems, however, to have been but a spurt with no lasting qualities. Some attribute the falling off to the very mild weather experienced during the greater part of the week, and have a slight hope that a recurrence of cold weather will again stimulate the demand. Others, however, are inclined to believe that the fall trade is now about over, and that from this time forward orders will only come in in small quantities as merchants run out of stock. The character of the trade is unchanged. Such orders as are being received are for broken lots, causing very much more than the usual trouble in packing. Western Hardware merchants continue to visit the fair in large numbers and are frequent visitors at the wholesale houses, but their visits are not attended with very much business. The Heavy Hardware trade was considerably better last week than during previous weeks. The improvement in business has been principally in the demand for Iron and Steel. It does not indicate a better condition of trade among the usual patrons of Heavy Hardware jobbers, as a considerable part of this business comes from large consumers who ordinarily buy from mills.

Notes on Prices.

Wire Nails.—The Wire Nail market is in about the same condition as for the past week or two, and without evident improvement. There is, however, perhaps a slight increase in the demand, but orders are not placed with any freedom. Prices are substantially as at our last report—namely, $1.30 for carload lots at mill. This quotation is quite general, and is but slightly shaded in exceptional cases, so that anything below this figure may be regarded as somewhat under the market. Some business is being done in anticipation of an early closing of navigation, but this fact has not as much effect as usual, inasmuch as the trade are very conservative in their purchases, and even the low prices ruling are not sufficient inducement to secure the placing of liberal orders.

Advices from Chicago.—Manufacturers of Wire Nails report a considerably better inquiry and numerous sales of round lots. Quite a number of jobbers through the Northwest have realized the fact that navigation will close within the coming month and are now placing contracts in order to receive stock at the low freight rates prevailing by the water routes. The demand is also based to some extent on the very low prices ruling for Wire Nails and the belief that they are selling either at or below cost. They reason that this will compel a heavy curtailment of production in the near future and that it may possibly be followed by an advance in price. The inquiries and sales are for the most part for the month of November, but in some cases cover the whole period intervening to the close of the year. Prices on factory lots are still quoted at $1.40 to $1.45, Chicago, but these rates have been shaded on the largest quantities sold. Small lots from stock are quoted in a regular way at $1.55, but a large part of the trade is done on the basis of $1.50.

Cut Nails.—The volume of business in Cut Nails is light, but there has been no weakening in prices. The Eastern market is represented by the quotation of $1 base on carload lots at mill and manufacturers are indisposed to make concessions, except in special cases. There are indications of a disposition on the part of Western mills to strengthen their prices somewhat, and in some cases extreme quotations have been withdrawn. As a result of this condition some of their most recent quotations name a slightly higher base or require a better average. This is not regarded as indicating the probability of an advance or any radical improvement in the tone of the market, but is rather a result of the conservative disposition on the part of the mills, who desire to obtain more remunerative prices. Small lots from store in New York are quoted at $1.25 to $1 30.

Advices from Chicago.—The Cut Steel Nail trade is hardly in as active condition as the Wire Nail trade. Orders are still confined to small quantities, on which manufacturers continue to quote $1.20 @ $1.25. Jobbers quote small lots from stock at $1.30.

Barb Wire.—The Barb Wire market continues weak and there is only a moderate volume of business. Manufacturers are desirous of securing orders and are going to the relatively small trade to a larger extent than usual, their business with the jobbers being this season comparatively light. Quotations are on a basis of $2.25 to $2.30 for Four-Point Galvanized, at mill, but these figures are sometimes slightly shaded. Painted is held regularly at 40 cents less.

Advices from Chicago.—The Barb Wire business shows no improvement. Manufacturers are sending out their travelers and endeavoring to secure what trade they can, but reports thus far are not encouraging. Jobbers are doing very little in this branch of trade, and state that such business as is going is still handled almost entirely by manufacturers. Quotations are repeated on carload lots of ordinary Galvanized Barb Wire at $2.40 and Glidden at $2.50. Less than carload lots of ordinary Galvanized are quoted at $2.55.

Hardware Shelf Boxes.—We give below the price-list of A. H. Green, successor to S. H. Green, 22 Park place, New York, covering the line of Lock Corner Wood Boxes which he is manufacturing for the trade. These Boxes, it will be observed, are made so as to be interchangeable. The sizes given below are outside measurement and without covers. The list is as follows, subject to a discount of 50 per cent.:

No.	Long.		Wide.		High.	Each.
1.....	10½	x	3	x	3½.....	$0.07
2.....	10½	x	4½	x	3½.....	.08
3.....	10½	x	6	x	3½.....	.09
4.....	10½	x	9	x	3½.....	.13
5.....	10½	x	12	x	3½.....	.16
7.....	10½	x	18	x	3½.....	.24
22.....	10½	x	4½	x	7	.11
23.....	10½	x	6	x	7	.14
24.....	10½	x	9	x	7	.18
25.....	10½	x	12	x	7	.24

To parties fitting up with new shelving Mr. Green suggests that if each division is made 36 inches wide, 7 inches between shelves and 10½ inches front to back, these boxes will completely fill them, either of one size or a variety of sizes in the same shelf. All the above sizes are carried in stock. Special sizes are also made to order in quantities of 50 and upward of a size.

A Screw case containing 80 drawers, furnished with chestnut knobs, is also made, the price being $7.50 each, net. The size of the case is as follows: 29½ inches high, 25½ inches wide and 8¼ inches front to back. Each drawer is intended to hold at least 1 gross of Screws.

Stove Truck.—The Lock Frame Stove Truck, manufactured by Randall & Ward, Le Roy, N. Y., and described in a recent issue, is sold to the trade at $15 per dozen for the wood and $18 per dozen for the steel.

Cordage.—Within the past week there has been no quotable change in the price of Cordage, but the market is weak, and somewhat lower quotations can be obtained in special cases.

Glass.—Jobbers report the demand about the same, orders being for small quantities, and that orders are filled with imported Glass when Ameri-

can Glass of the desired sizes cannot be obtained. Grinders and polishers are at work on rough Plate Glass in manufacturers' hands to supply the demand, and there seems a probability of Plate Glass factories starting up before the first of the year. Quotations on all kinds of Glass are unchanged.

Old Metals.—The demand for Old Metals continues moderate and prices are inclined to be weak and irregular. The present low prices of Scrap Iron are, however, commanding a little more attention on the part of buyers in some quarters, and some fair sales of Wrought and Cast Scrap have been noted. Quotations for New York delivery are about as follows:

Heavy Copper	₩ lb 6¾¢
Light and Tinned Copper	₩ lb 6¼¢
Heavy Brass	₩ lb 5¼¢
Light Brass	₩ lb 4½¢
Lead	₩ lb 3¢
Tea Lead	₩ lb 2½¢
Zinc	₩ lb 2½¢
No. 1 Pewter	₩ lb 14¢
No. 2 Pewter	₩ lb 6¢
Wrought Scrap Iron....₩ gross ton	$11.00 @ $12.00
Heavy Cast Scrap.....₩ gross ton	11.50 @ 12.00
Stove Plate Scrap.....₩ gross ton	7.00 @ 8.00
Burnt Iron (delivered at mill) ₩ gross ton	6.00 @ 7.00

Old Rags, Paper, &c.—The market for this material shows little indication of improvement. Prices remain at about the level of last week, with a dull demand. Quotations rule about as follows for New York delivery:

No. 1 White Rags	₩ lb 3¼ @ 3½
No. 2 White Rags	₩ lb 2¼ @ 2½¢
Mixed Rags	₩ lb 3¼¢
Blues and 3ds	₩ lb 1 @ 1¼¢
Hard Sized White Shavings	₩ lb 2¼¢
No.1 White Book Shavings	₩ lb 2 @ 2⅛¢
No.2 White Book Shavings	₩ lb 1 @ 1⅞¢
Light Book Shavings	₩ lb ¾¢
No. 1 Mixed Shavings	₩ lb ¾¢
No. 2 Mixed Shavings	₩ lb ⅝¢
No. 1 Printed Books	₩ lb 1 @ 1¼¢
Ordinary Mixed Books	₩ lb ⅛ @ ¾¢
Newspapers	₩ lb 3-5¢
No. 1 Manila Paper	₩ lb ⅞ @ 1 ¢
No. 2 Manila Paper	₩ lb ⅝ @ ¾¢
Bogus Paper	₩ lb ½¢
Common Paper	₩ lb ⅜ @ ½¢
Straw Chips	₩ lb ½ @ ⅝¢
Binders' Clippings	₩ lb ½ @ ⅝¢
Jute Butts	₩ lb 1¼ @ 1⅜¢
No. 1 Jute Bagging	₩ lb 1 ¢
Mixed Bagging	₩ lb ¾ @ 1 ¢
No. 2 Bagging	₩ lb ½ @ ¾¢
Hemp Twine	₩ lb 2¼¢
Manila Rope	₩ lb 2½¢
Jute Rope	₩ lb 1½ @ 1⅝¢
Mixed Rope	₩ lb ¾ @ ⅞¢

Old Rubber.—There is little or no market for Old Rubber at present. Prices at present ruling are about as follows:

Car Springs, ton lots, ₩ lb.	@ $0.03¼
Rubber Shoes, carloads, delivered at factory, ₩ lb..	@ .03
Rubber shoes, less than carloads, ₩ lb.	0.02¼ @ .03⅛
Large Hose, ₩ ton	@ 9.00
White Wringer Rolls, ₩ lb.	@ .04¼
White Syringes, ₩ lb.	@ .05

Trade Notes.

E. P. Fisk, traveling for F. H. Cunningham & Co., Iron Pipe and Fittings, Boston, is the hero of the following tale told by some of his fellow travelers. According to the story, Mr. Fisk was awakened one night by a burglar, and, sitting up in bed, addressed the intruder, saying, "Well, what are you looking for?" The burglar replied "I'm looking for money." "Money," echoed Fisk, "looking for money here! Wait a moment and I will strike a light and help you."

Charles Gallager of S. G. Davis & Co, Boston, is another victim of the gossiping propensities of the Brotherhood of New England Prevaricators. It is reported that on one occasion, visiting a town soon after the demise of an old customer, he called to tender his sympathy to the widow, but being somewhat unused to such duties and naturally inclined to timidity, twisted his language and said, "I tender you my sincere regards."

The large establishment of the John F. Henzlen Elbow Tinware Mfg. Company, Detroit, Mich., was totally destroyed by fire on October 15. The losses are stated to be entirely covered by insurance.

The Gartland Foundry Company, Cleveland, Ohio, report an improving business, and state that they have orders on hand sufficient to keep them running for some time.

A postal card, bearing date of October 12, contains the announcement that Rodney W. Beach and James F. McGregor have purchased the plant of the Michigan Galvanizing Works, 762, 764 and 766 Woodbridge street, West, in the city named, and are now prepared to fill all orders promptly for galvanizing Cast, Malleable and Sheet Iron. A specialty is made of galvanizing Wire Cloth.

James H. Brady of Kansas City, Mo., has recently patented a system for heating, cooling and ventilating buildings, applicable more especially to school houses, churches, places of amusement, hotels and the like. The improved warming and ventilating apparatus consists of a furnace having an air mixing chamber connected with the outside air and radiating tubes so located as to heat the air in the mixing chamber and connected by pipes to receive the heating liquid from the boiler of the furnace. A single large flue contains a series of parallel vertical straight passages which extend from the mixing chamber and project through the roof of the building, the lower end of each passage communicating with the mixing chamber. There are also horizontal partitions which divide each of these passages into separate lower and upper chambers, each upper chamber being connected with the lower portion of separate rooms in such a way as to form a separate outlet for the air discharged into a given room by a different chamber or passage. The lower chambers referred to are connected by an opening with the upper part of separate rooms in the stories below the rooms to which the upper chambers are connected, and forming supply passages for the rooms in the stories below entirely separated from the discharge passages from the same rooms, whereby the air of all the rooms is supplied by the lower chambers of said passages, but is discharged from said rooms by way of the upper chambers thereof, which are out of alignment with the lower chambers through which the same air was delivered to the rooms. The upper and lower chambers have like cross sectional area to provide both a free supply and discharge of air to each room. In each passage of the flue mentioned is a pair of liquid circulating heat radiating pipes, these extending from end to end through the partitions and connected at their lower ends with the boiler of the furnace.

H. H. Buzzell & Son are about to start a brass foundry at Laconia, N. H.

The Ferracute Machine Company of Bridgeton, N. J., manufacturers of Presses, Dies and other Sheet Metal Tools, have kept their works running during the entire summer with a part of their force. Orders are now coming in much better than a month ago, and trade prospects seem much brighter.

Attention is directed to the advertisement of J. E Clarey, secretary of the Weir Furnace Company, Des Moines, Iowa. Any parties who contemplate embarking in the furnace business may write Mr. Clarey, who is in a position to interest them in this direction.

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Metal and Miscellaneous Prices.

CHICAGO, OCTOBER 19, 1893.

Tin—

Straits pigs.....23¢

Imported Tin Plates—

Charcoal Plates.—Bright.

Guaranteed Plates command special prices, according to quality.

		Per box.
Calland and Melyn Grade	IC, 10 x 14.....@	$6.75
	IC, 12 x 12.....@	6.75
	IC, 14 x 20.....@	6.75
	IC, 20 x 28.....@	13.50
	IX, 10 x 14.....@	8.75
	IX, 12 x 12.....@	8.75
	IX, 14 x 20.....@	8.75
	IX, 20 x 28.....@	17.50
	DC, 12½ x 17.....@	6.50
	DX, 12½ x 17.....@	8.50
Allaway Grade,	IC, 10 x 14.....@	6.50
"	IC, 12 x 12.....@	6.50
"	IC, 14 x 20.....@	6.50
"	IC, 20 x 28.....@	13.00
"	IX, 14 x 20.....@	8.00
"	IX, 20 x 28.....@	16.00

Coke Plates—Bright.

	Per box.
Steel Coke—IC, 10x14.14x20.	$5.75 @$5.85
IC, 14x20.90 ℔	5.50 @ 5.60
IC, 14x20, 100℔	@ 5.85
10 x 20	8.75 @ 9.00
20 x 28	11.50 @12.70
X, 10x14, 14 x 20	@ 7.35
B.V. Grade. IC,10x14, 14x20.	5.85@ 6.00

Charcoal Plates.—Terne.

Guaranteed Plates command special prices, according to quality.

Mansel and Dean Grades.—

IC. 14 x 20	@ $5.62½
20 x 28	@ 11.25
IX. 20 x 28	@ 14.25

Worcester Brand and equal.—

IC, 14 x 20	6.12½@ .....
IC, 20 x 28	12.25 @ .....
IX, 14 x 20	7.62½@ .....
20 x 28	15.25 @ .....

American Tin Plates.

Charcoal Plates.—Bright.

Irondale, A. A.—IC, 14 x 20	$7.00
" " IX, 14 x 20	9.00
" " IXX, 14 x 20	11.00
" " IC, 20 x 28	14.00
" " IX, 20 x 28	18.00
" " IXX, 20 x 28	22.00

Florence.—

IC, 10 x 14, 12 x 12, 14 x 20	$6.75
IX, 10 x 14, 12 x 12, 14 x 20	8.50

Palma.—

IC, 10 x 14, 12 x 12, 14 x 20	$7.25
IX, 10 x 14, 12 x 12, 14 x 20	9.25

Each extra cross $2.00 and 20 x 28 double these prices.

Brilliant, Tissue Packed, IC, 14 x 20.	$9.25
Royal ,extra, IC, 14 x 20	7.25
Merion, IC, 14 x 20	7.00
Almond, IC, 14 x 20	6.50
Mint, IC, 14 x 20	6.25

Coke Plates.—Bright.

Elwood.—IC, 14 x 20	$6.00
" IC, 20 x 28	12.50

Roofing Plates.

Arch, IC, 20 x 28	@$11.75
Crescent, IC, 20 x 28	@ 12.25
Crescent, IX, 20 x 28	@ 15.25
Empire, IC, 20 x 28	@12.50
Empire, IX, 20 x 28	@15.50
Hickory, IC, 20 x 28	@ 12.75
" IX, 20 x 28	@ 15.75
Alaska (heavily coated), IC, 20x28	@$14.50
Alaska IX, 20 x 28	@ 17.75
Special, IC, 20 x 28	@ 15.50
" IX, 20 x 28	@ 18.50
Merchant's Roofing (extra coated), IC, 20 x 28	@$17.75
Merchant's Roofing (extra coated), IX, 20 x 28	@$21.50
Merchant's Old Method, (extra heavily coated), IC, 20 x 28	@$19.75
Merchant's Old Method (extra heavily coated), IX, 20 x 28	@$23.60
Irondale A:	
IC, 14 x 20	$6.25
IX, 14 x 20	7.75
IC, 20 x 28	12.50
IX, 20 x 28	15.50
Westmoreland:	
IC, 14 x 20	$6.25
IC, 20 x 28	12.50
Elwood:	
IC, 20 x 28	$12.00
Juno:	
IC, 14 x 20	$5.75
IC, 20 x 28	11.50
Illinois, Old Method:	
IC, 20 x 28	$17.00
E. L.:	
IC, 20 x 28	$12.50
Jessie:	
IC, 20 x 28	$12.00
Scott's Extra Coated, Stamped and Resqured, IC, 14 x 20	$9.50
Scott's Extra Coated, Stamped and Resqured, IX, 14 x 20	11.00
Scott's Extra Coated, Stamped and Resqured, IC, 20 x 28	19.00
Scott's Extra Coated, Stamped and Resqured, IX, 20 x 28	22.00
Neville, Stamped, IC, 14 x 20	6.25
" " IX, 14 x 20	7.50
" " IC, 20 x 28	12.50
" " IX, 20 x 28	15.00
Taylor's Old Style, IC, 14 x 20 (Stamped and Resqured)	$9.50
Taylor's Old Style, IC, 20 x 28 (Stamped and Resqured)	19.00
Taylor's Roofing, IC, 14 x 20 (Stamped and Resqured)	8.25
Taylor's Roofing, IC, 20 x 28 (Stamped and Resqured)	16.50
Columbia, IC, 14 x 20 (Stamped)	7.25
" IC, 20 x 28 (Stamped)	14.50
Maple, IC, 14 x 20 (Stamped)	6.75
" IC, 20 x 28 (Stamped)	13.50
Willow, IC, 14 x 20	6.50
" IC, 20 x 28	13.00
Knoxall, IC, 14 x 20	6.25
" IC, 20 x 28	12.50
Globe, IC, 14 x 20	6.00
" IC, 20 x 28	12.00
Miami, IC, 14 x 20	6.00
" IC, 20 x 28	12.00
" IX, 20 x 28	15.00
" (Redipped), IC, 20 x 28	17.00

Tin Boiler Plates.

	Per box of 100 sheets.	Per box of 112 sheets.
X, 14 x 28	$13.00	$13.00
XX, 14 x 28	14.50	14.50
X, 14 x 31	14.50	15.80
XX, 14 x 31	16.50	17.50

	Per box of 56 sheets.	
X, 14 x 56	29.50	16.50
XX, 14 x 56	32.50	18.20
X, 14 x 60	31.50	17.65
XX, 14 x 60	35.50	20.90

Sheet Iron—

Black.

	Common American	Refined.
Nos. 10 to 16	℔ 2 6-10¢	3 2-10¢
17 to 20	℔ 2 7-10¢	3 3-10¢
21 to 24	℔ 2 8-10¢	3 4-10¢
25 and 26	℔ 2 9-10¢	3 5-10¢
27	℔ 3¢	3 6-10¢

Russia, Planished, &c.

Genuine Russia, all numbers....13¢ net.

Patent Planished....℔ D A, 10½¢; B, 9½¢ dls. 5%

Craig's Polished Sheet Steel.....8½¢

Galvanized.

Juniata or first quality.....dis. 70&5%

Copper—

Ingot.

Lake.....11¾¢ @ 12¼¢

Casting Brands.....11¢ @ 11½¢

Sheet and Bolt.

Discount, 25%.

Copper Bottoms.

Discount, 25%.

Seamless Brass and Copper Tubes.

Base price, 17½¢, Chicago, with extras according to size.

Copper, Bronze and Gilding Tube, 3¢ ℔ additional.

Brazed Brass Tubing.

(To No. 20 inclusive.)

Add freight from New York to Chicago to these prices, or 50¢ ℔ 100 ℔.

Above 5-16 inch to 3 inch inclu	35¢
Plain, above 3 inch	45¢
Plain, 5-16 inch	45¢
Plain, ¼ inch	60¢
Plain, 3-16 inch	$1.00
Plain, ⅛ inch	$1.50
Fancy Tubing, Brass, to No. 20 incl	43¢ ℔
Bronze Tubing, 3¢ ℔ more than Brass	

40 @ 45%

Roll and Sheet Brass.

Discount, 35 @ 40%.

Slab Spelter—

Western Spelter.....5 ¢

Sheet Zinc—

600 ℔ casks	5 ¢
300 ℔ casks	5¼¢
Loose sheets	5½¢

Lead—

Soft Pig Lead	4¢
Bar	4½¢
Pipe	5½¢, dis. 10¢
Block Tin Pipe	35¢
Sheet	6¢, dis. 10%

Solder—

⅛&½	13¢@13¼¢
Extra Wiping	11½¢

The prices of the many other qualities of Solder in the market indicated by private brands vary according to composition.

Antimony—

Cookson	12¢@12½¢
Hallett's	11¾¢@11¾¢

Wrought-Iron Pipe—

List on following page.

1¼ and under, Plain	57½&10%
1¼ and under, Galv	52½&10%
1½ and over, Plain	67½&10%
1½ and over, Galv	60&10%
Boiler Tubes, list Oct. 24, 1892	65@67½%
Casing, list Nov. 16, 1892	52½%
Inserted Joints Casing, list Nov. 16, 1892	47½%
Steel Boiler Tubes	27½%
Cold Drawn Seamless Steel Tubing	50%

Cast-Iron Soil Pipe—

Cast-Iron Soil-Pipe, Tarred; sizes 2 to 6 inches, inclusive.....dis 70&2½%

Other sizes.....dis 60%

Leader Pipes—

Abendroth's Galv. Spiral Riveted	60%
Austin's Corrugated	60%
Gordon & Gilbert's Corrugated	60%
Ritchie's (Galv. Iron only) Cor'd	60%
Ritchie's Spiral Lock Seam, Galv'd	60%
Austin's Spiral Ribbed Pipe	55%
Plain Adjustable Elbows	60%
James A. Miller Bros. (Galv'd Iron only) Corrugated	60%

Furnace Fittings—

Discount from Excelsior Steel Furnace Co.'s list.....50%

Steel Roofing—

Perfection	$3.75 square
Climax	$3.50 square
The Lloyd Spanish Tiling	$4.50 square

Metallic Shingles—

Cushman's	$1.25 square
Merchant & Co.'s Spanish Tiles:	
Copper, 14 oz	$36.00 square
Tin	$9.75@$14.25 square
Steel, painted	$9.00 square

Drain Pipe—

Discount from list.....50%

Paints Oils, &c.—

Deodorized Benzine	7½@8 ¢
Iron Paint, Bright Red	℔ D, 2 ¢
" " Brown	℔ D, 1½¢
" " Purple	℔ D, 2½¢
" Ground in oil, B. Red	℔ D, 6½¢
" Ground in oil, Red	℔ D, 6½¢
" Ground in oil, Brown	℔ D, 5½¢
" Ground in oil, Purple	℔ D, 6 ¢
Linseed Oil, Boiled, in bbls	40¢
Linseed Oil, Raw, in bbls	37¢
Mineral Paints	2@4¢
Orange Mineral	10¾¢
Pure White Lead in Oil	6¾@7¼¢
Dry White Lead in bbls	6¾@6¾¢
Red Lead, American	7@7½¢
Red Venetian, English, dry	$1.65@$1.70
Red Venetian in oil; asst'd cans, 8½¢; kegs	7½¢
Sipe's Japan Oil, in bbls, ℔ gal	34¢
Spirits Turpentine, in bbls., ℔ gal	33½¢
Asphaltum, Trinidad Refined, ℔ ton	$45
Tarred Felt, 1 Ply, ℔ 100 ℔	$1.60
Tarred Felt, 2 Ply, ℔ roll 108 sq. feet	$1.25
Tarred Felt, 3 Ply, ℔ roll of 108 sq. feet	$1.75
Roofing Pitch, ℔ bbl. of 300 ℔	$3.00

NEW YORK, OCTOBER 20, 1893.

The following quotations are for small lots.

Aluminum—

No. 2 Grade Metal, in ton lots..℔ D, $0.75

No 1 (guaranteed to be 98 % pure and over), in ton lots .....℔ D .90

Lots less than 1 ton, 10¢ ℔ D additional.

Antimony—

Cookson .....℔ D, 11¢

Hallett's.....℔ D, 10¼¢@10½¢

Brass—

Planished.....net

Roll and Sheet.....35@40%

Brass and Copper Tubes

Brazed Brass Tubing—

List May 20, 1889.

	Per D.	
Plain, to No. 20 inclusive, above 5-16 inch to 3 inch inclusive	$0.35	35@40%
Plain, to No. 20, above 3 inch	45	
Plain, 5-16 inch to No. 20	45	
Plain, ¼ inch	60	
Plain, 3-16 inch	1.00	
Plain, ⅛ inch	1.50	
Fancy Tubing to No. 20, inclu	43	

Copper and Bronze Tubing—

3¢ ℔ D more than brass.

Bronze, Tobin—

Drawn Rods for Bolts, Forgings, &c

Over ¼ to 3½ inches inclusive....17¢ ℔ D

Over 3½ to 5 inches inclusive.....18¢ ℔ D

Piston Rods, Finished True, Smooth and Straight.

Over ¼ to 3½ inches inclusive....18¢ ℔ D

Over 3½ to 5 inches inclusive.....19¢ ℔ D

Clips—

Buffalo Damper: Nos. 1, $1,25; 2, $2.50 per doz.....40&10%

Conductors—

Corrugated. *Round or Square*—

Galvanized.....60%

Galvanized, Locked Joints.....60%

Tin.....60%

Spiral Riveted—

Galvanized.....50%

See also *Elbows and Shoes; Eave-Trough Miters; Strainers, Conductor.*

Conductor Strainers—See *Strainers, Conductor.*

Copper—

Bottoms, Pits and Flats....25@25&5%

Ingot.

Lake.....11¢

Ansonia Grade Arizona.....10¼¢

Ansonia Grade Casting.....10¢

Planished.....net

Sheet and Bolt.....25&25&5%

Tubes—See *Seamless Brass Tubes.*

Coppers, Soldering—

See *Irons, Soldering*, in Current Hardware Prices.

Damper Clips Buffalo—

See Clips, Buffalo Damper.

Eave Troughs—

Lap or Slip Joint, Galvanized.....60&10%

Lap or Slip Joint Terne.....60%

Eave-Trough Mitres—

Lap or Slip Joint.....list, net

Elbows—

Plain Adjustable—

Tin.....70%

Galvanized.....70%

Crimped Tubing—

Re-Tinned or Galvanized.....35%

Stove-Pipe—

Buffalo Four-Piece.

4½	5	5½	6	7 inch,
$0.78	.87	.90	.99	1.20 per doz.

..20 %

Elbows and Shoes—

Flat Crimp.

Tin.....35%

Galvanized.....35%

Corrugated.

Flat Crimp.

Galvanized.....60%

Round or Square.

Tin.....60%

Galvanized.....60%

Iron, Sheet—

Black.

	Common American.	R. G. American.	Cleaned
Nos. 10 to 16	℔ D, 2¾		3.10¢
Nos. 17 to 20	℔ D, 2.85		3.10¢
Nos. 21 to 24	℔ D, 2.90		3.20¢
Nos. 25 and 26	℔ D, 3.05		3.30¢
No. 27	℔ D, 3.15		3.40¢
No. 28	℔ D, 3¼		3½¢
American B. B	℔ D,		4¢@4¼¢

Russia, Planished, &c.

Genuine Russia, according to assortment.....℔ D, 11¾@12½¢

Patent Planished....℔ D, A, 10¢; B, 9¢, 5%

Craig Polished Sheet Steel.....℔ D, 8½¢

Galvanized.

	B. B.	
Nos. 10 to 16		70&2½%@ 70&5%
Nos. 17 to 22		
Nos. 23 to 24		
Nos. 25 to 26		
No. 27		
No. 28		
Nos. 29 and 30		

Filter Joints—

Lee's.....33⅓

Lead—

American Pig	4½¢@4¼¢
Bar	4½¢
Pipe	6¼¢, 20%
Tin Lined Pipe	15¢, 20%
Block Tin Pipe	37½¢, 20%
Sheet	7¢, 20%
Old Lead in exchange, 3½¢ ℔ D.	

Metal, Expanded—

Manufacturers' list No. 5.

Lathing	10%
Fencing, Painted Sheets	20%
Netting, Painted Sheets	20%
Door Mats, Galvanized	25%
Window Guards, Paneled	15%
Tree Guards, Paneled	15%

Mitres Eave-Trough—See *Eave-Trough Mitres.*

Paints Oils &c.—

Lead, Amn. White, in oil	6¾ @ 7¼
Lead, Red, bbls. and ⅛ bbls	6½ @ 7
Lead, Red, kegs	6½ @ 7
Ocher, American	1 @ 1½
Red, Venetian, American	1½ @ 2½

Linseed Oil:
Raw, ₩ gal..... @ .10
Boiled..... @ .43

Spirits Turpentine:
In bbls..... @ .32

Putty:
In barrels and ½ bbls..... .01⅜ @ .01¾
In tubs..... .01⅝ @ .01¾
In tin cans..... .01½ @ .02½
In bladders..... .01⅞ @ .02¼

Roofing Material, &c.:
Asphaltum, Trinidad Refined, ₩ ton..... $30.00@$35.00
Asphaltum, Rock, ₩ ton..... $14.00
Coal Tar Felt, 1 Ply, ₩ ℔..... 2¢
Coal Tar Felt, 2 Ply, ₩ roll 108 sq. ft. $1.42½
Coal Tar Felt, 3 Ply, ₩ roll 108 sq. ft. $1.85
Roofing Pitch, ₩ bbl..... $2.75

Pipe, Drain 50%

Pipe and Fittings, Cast Iron Soil—

Cast-Iron Soil Pipe, Tarred, sizes 2 to 6 Inches, inclusive..... 60@60&10%
Other sizes..... 55@55&10%
Cast-Iron Fittings, Tarred, sizes 2 to 6 inches..... 60@60&10%
Other sizes..... 55@55&10%

Pipe, Spiral—

Galvanized..... 60%
Tin..... 60%

Rock and Slag Wool—

	₩ ℔	₩ cub. foot.
Slag Wool, ordinary	1¼	15¢
Slag Wool, extra	4¼	38½¢
Rock Wool, ordinary	2¼	27¢
Rock Wool, extra	7¼	43½¢

Rosin—

Common and Good—Strained,
Rosin, C. & D..... ₩ bbl. $1.23@$1.24
Rosin, E. & F..... ₩ bbl. $1.30@$1.50
Rosin, G. & H..... ₩ bbl. $1.55@$1.70
Rosin, I. & K..... ₩ bbl. $1.85@$2.40
Rosin, M. & N..... ₩ bbl $2.80@$3.50

Seamless Brass Tubes..net

Shoes and Elbows—See *Elbows and Shoes.*

Slate Roofing—

According to size, f.o.b. cars, Quarry Station.

Pennsylvania:
Best Bangor, ₩ sqr..... $3.25@$4.50
Pen Argyle, ₩ sqr..... 3.50@ 4.25
Peach Bottom, ₩ sqr..... 5.00@ 6.25
No. 1 Chapman, ₩ sqr..... 4.00@ 4.65
Lehigh Slates, ₩ sqr..... 3.00@ 4.50
Vermont:
Sea Green, ₩ sqr..... 2.70@ 3.20
Purple, ₩ sqr..... 3.50@ 4.50
Unfading Green, ₩ sqr..... 3.50@ 4.00
Red, ₩ sqr..... 9.75@12.00

Solder and Soldering Fluids—

Solder—

½ & ½ (Guaranteed)..... 13½@14½¢
No. 1..... 11¾@12 ¢
Prices of Solder indicated by private brands vary according to composition.

Soldering Fluids—

Concentrated Soldering Flux.
f.o.b. New York.
In barrels, ₩ ℔..... 4¢
Smaller quantities, ₩ ℔..... 5¢

Gedney's Soldering Fluid.
In carboys or barrels, ₩ ℔..... 2¢
$1.50 for carboy or barrel; money refunded when returned.

Perfection Soldering Flux.
No charge for package.
Bbls., about 500 ℔, ₩ ℔..... 3½¢
½ bbls., about 300 ℔, ₩ ℔..... 4¢
Kegs, about 110 ℔, ₩ ℔..... 4¢
75¢ extra for keg. } 5% dis.
Kegs, about 55 ℔, ₩ ℔..... 4¢

Yager's Soldering Salts.
½-℔ bottles, each..... 30¢
Large quantities, per ℔..... 40¢

Spelter—

Western Spelter..... 4¼¢@4¾¢
Bertha..... 8¾¢@9¢

Spiral Pipe—See *Pipe, Spiral.*

Stove-Pipe Elbows—*See Elbows, Stove Pipe.*

Stove Polish—See *Polish, Stove.*

Stove Trucks—See *Trucks, Stove.*

Strainers Conductor—

Galvanized..... 60%

Tin, Pigs and Bars—

Banca, pigs, ₩ ℔..... 22½¢
Straits, pigs, ₩ ℔..... 22¢
Straits in bars, ₩ ℔..... 23¢

Tin Plates—

American Terne Plates—

Alaska (re-squared) IC, 14 x 20.... $7.00
Alderly, extra quality, IC, 14 x 20..6.87½
Allegheny, IC, 14 x 20..... 6.12
" IX, 14 x 20..... 6.38
Apollo Roofing, IC, 14 x 20..... 6.25
" " IX, 14 x 20..... 7.25
Bonus, Extra Coated, IC, 14 x 20... 6.75
" " " IX, 14 x 20.... 8.25
Buckeye, IC, 14 x 20..... 7.00
" IX, 14 x 20..... 8.25
Chicago, IC, 20 x 28..... 11.50
Central, IC, 14 x 20..... 5.37½
Climax, IC, 14 x 20..... 5.70
Columbia, IC, 14 x 20..... 7.06
Crescent, IC, 14 x 20..... 6.00
Dunlap's Double Dipped, IC, 14 x 20 8.25
" " " IX, 14 x 20 9.50
" Domestic, IC, 20 x 28 ....12.00
" " IX, 20 x 28 ... 15.00
Empire, IC, 14 x 20 ..... 6.12½
Extra Central, IC, 14 x 20..... 5.62½
First New York, IC, 14 x 20..... 5.75
First New Jersey, IC, 14 x 20..... 5.75
Flag, IC, 14 x 20..... 5.50
Fort Pitt, IC, 20 x 28 ..... 11.00
Globe, IC, 14 x 20..... 5.75
Hamilton's Best Redipped, IC, 14x20 9.25
" " " IX, 14x20 10.75
Hickory (Resquared), IC, 14 x 20..6.37½
Juno, IC, 14 x 20..... 5.75
Kensington, IC, 14 x 20 ..... 6.75
" IX, 14 x 20 ..... 8.00
Knoxall, IC, 14 x 20 ..... 6.00
Laufman's Apollo (Resquared), IC, 14 x 20 ..... 8.12
Laufman's Apollo (Resquared), IX, 14 x 20 ..... 9.37
Leominster, Extra Coated, IC, 14x20 7.75
Lion (Stamped), IC, 14 x 20..... 6.25
Lula, Best Charcoal, IC, 20 x 28....12.50
" " IX, 20 x 28....16.00
Manhattan, IC, 14 x 20 ..... 7.00
Maple, IC, 14 x 20 ..... 6.50
Merchant's Old Method (Resquared), IC, 14 x 20 ..... 9.50
Merchant's Roofing (Resquared), IC, 14 x 20..... 8.50
McKinley, IC, 20 x 28..... 12.00
" IX, 20 x 28..... 15.00
Neville, IC, 14 x 20 ..... 6.00
" IX, 14 x 20..... 7.25
N. F. Old Style, IC, 14 x 20..... 7.50
" " " IX, 14 x 20..... 9.00
Old Colony, IC, 14 x 20..... 8.00
Optimus, Best Redipped, IC, 14 x 20 8.25
" " " IX, 14 x 20 9.50
Osceola, Hand Coated, IC, 14 x 20.. 8.25
" " " IX, 14 x 20.. 9.75
Palacio, IC, 14 x 20..... 5.55
Pennsylvania Old Method (Treble Coated), IC, 14 x 20..... 8.50
Phœnix, IC, 14 x 20..... 5.80
Scott's Extra Coated (Resquared), IC, 14 x 20 ..... 9.25
Scott's Extra Coated (Resquared), IX, 14 x 20..... 10.75
Taylor Old Style (Resquared), IC, 14 x 20..... 9.25
Taylor Roofing, IC, 14 x 20..... 8.00
Thomson's Puritan, IC, 14 x 20..... 5.75
Tip Top, IC (Resquared), 14 x 20..... 6.62
" IX " 14 x 20..... 7.88
U. S. Monongahela, IC, 14 x 20..... 6.50
U. S. Redipped, IC, 14 x 20..... 9.25
Venux, IC, 14 x 20 ..... 5.60
Waldo Redipped, IC, 14 x 20..... 7.25
Westmoreland, IC, 14 x 20 ..... 6.25
Wilkinsburg Redipped, IC, 20 x 28.16.00
" IX, 20 x 28.19.00
Willow, IC, 14 x 20..... 6.25

American Bright Plates—

Almond, IC, 14 x 20..... $6.25
Brilliant (Tissue Packed), IC, 14x20. 9.00
Climax, IC, 14 x 20..... 6.50
" IX, 14 x 20..... 8.00
Florence, IC, 14x20..... 6.75
Hazel, IC, 14x20..... 5.85
Linden, IC, 14x20..... 6.50
Merchant's Dipped, IC, 14x20..... 11.00
Merion, IC, 14x20.. ..... 6.75
Mint, IC, 14x20..... 6.00
Palma Xtra, IC, 14x20..... 7.25
Phœnix, IC, 14x20..... 6.25
" IX, 14x20..... 7.75
Royal, Extra, IC, 14x20..... 7.00
U. S., IC, 14x20..... 7.25

Imported Terne Plates—

Charcoal.
Dean Grade.—IC, 14 x 20.....@$5.50
20 x 28.....@11.00
IX, 14 x 20.....@ 6.75
20 x 28.....@13.50
Abercarne Grade.—IC, 14 x 20.....@ 5.40
20 x 28.....@10.80
IX, 14 x 20...@ 6.62½
20 x 28.....@13.25

Imported Bright Plates—

Charcoal.
Duty: 2.2¢ ₩ ℔.
Melyn and Cal-land Grade. IC, 10 x 14.....@$6.50
" " IC, 12 x 12.....@ 6.75
" " IC, 14 x 20.....@ 6.50
" " IC, 20 x 28.....@13.00
" " IX, 10 x 14.....@ 8.50
" " IX, 12 x 12.....@ 8.75
" " IX, 14 x 20.....@ 8.50
" " IX, 20 x 28.....@17.00
" " DC, 12½ x 17.....@ 6.00
" " DX, 12½ x 17.....@ 8.00
Allaway Grade. IC, 10 x 14.....@ 6.00
" " IC, 12 x 12.....@ 6.25
" " IC, 14 x 20.....@ 6.00
" " IC, 20 x 28.....@12.00
" " IX, 10 x 14.....@ 7.50
" " IX, 12 x 12.....@ 7.75
" " IX, 14 x 20.....@ 7.50
" " IX, 20 x 28.....@15.00
" " DC, 12½ x 17.....@ 5.50
" " DX, 12½ x 17.....@ 7.00

Coke.
Steel Coke.—IC, 10x14, 14x20.....@$5.50
10x20.....@ 8.50
20x28.11.50@12.00
IX, 10x14, 14x20.....@ 6.75
B. V. Grade.—IC, 10x14, 14x20....@ 5.55

Imported Boiler Plates.—

IXX, 14x26..(112 sheets)..... ..@$13.35
IXX, 14x28..(112 sheets)..... ..@ 14.50
IXX, 14x31..(112 sheets)..... ..@ 16.00

Tinning—

Brass and Copper.....net

Tubing—

Tin..... 55%
Galvanized..... 55%

Brass and Copper.—

Standard List..... 35@40%

Troughs, Eave—See *Eave Troughs*

Trucks Stove—

Improved Lock Frame, per doz....$15.00
Steel Lock Frame, per doz..... 18.00
Daisy Improved Pattern, ₩ doz..... 18.00

Zinc—

600 ℔ casks..... ₩ ℔ 5¾¢
Per ℔..... 6½¢

MANUFACTURING.

Hardware.

The Northwestern Barb Wire Company, Rock Falls, Ill., commenced operations on a small scale on the 2d inst., and expect to put on their full force in the near future.

A cut down of 10 per cent. in all departments of the Concord Axle Works, Penacook, N. H., went into effect on the 9th inst.

Blenkhorn & Son's axe factory, at Canning, N. S., was destroyed by fire on the 29th ult. Loss, $8000; insurance, $1000.

The Eagle Lock Company, Terryville, Conn., have commenced to work on short time and until further notice will run only four days per week.

The shovel works of the Oliver Ames & Sons' Corporation, North Easton, Mass., are running but nine hours a day.

The Vermont Farm Machine Company, Bellows Falls, Vt, closed down on the 30th ult. for the annual inventory. Advantage will be made of the shut down to make needed repairs.

At the annual meeting of the stockholders of the Portland Screen Company, Portland, Maine, the following persons were elected directors: W. S. Eaton, Wm. H. Stevens, F. A. Neal, Chas. W. Allen, Chas. J. Chapman, Fred. E. Haskell and Lewis A. Goudy. W. S. Eaton was elected president and Chas. R. Lewis treasurer. The reports of the officers showed that the company have earned a gratifying profit on the business of the past year, and a dividend of 6 per cent. was declared.

The Ely Hoe & Fork Company, St. Johnsbury, Vt., have resumed operations, after spending about $5000 on repairs to the works, putting in a new dam, &c.

The Western Screw Company, Chicago, Ill., have been incorporated, with a capital stock of $100,000. The incorporators are Michael J. Dunne, John T. Boos and Frank M. Burwash.

The Canton works of the Cleveland Axle Mfg. Company, Cleveland, Ohio, have resumed operations with a force of 160 hands. It is expected that 200 will be employed by November.

Wellsboro, N. Y., is to have a new industry in the form of a lock factory. A stock company has been formed, with a capital of $50,000, $10,000 of which has already been raised.

The Peck, Stow & Wilcox Company's main factories, at Southington, Conn., are again in full operation.

Lees Mfg. Company, Westport, Conn., are making over 100 different kinds of twine and make special twine for any purpose and put up in any way. They are running full time, and have only stopped for two weeks during the present year.

Clayton Bros., manufacturers of stee laid and cast iron shears, hardware specialties, &c., Bristol Conn., and 122 Chambers street, New York, have enlarged their plant so that their facilities for filling orders are much improved.

W. H. Davenport Fire Arms Company, Norwich, Conn., are preparing new designs and models for next year's business, and are intending to issue a complete catalogue which will represent their present as well as their new models.

The Frazier Cycle Company, 373 and 375 Wabash avenue, Chicago, with factory at Aurora, Ill., have so far built no bicycles, their attention having been confined exclusively to the manufacture of pneumatic sulky wheels, ball bearings for high wheels, &c.

The Kilmer Mfg. Company, Newburg, N. Y., are extremely busy and behind their orders.

The loss in the fire at the works of the Clinton Wire Cloth Company, Clinton, Mass, on April 19 last, has been adjusted, the loss being fixed at $170,000. This covers the loss to buildings, machinery and stock in process of manufacture. Through the system of insurance followed, the company's loss not covered by insurance is very small. Work on the new mill is progressing rapidly. The mill will be ready for the placing of machinery about December 1.

The factory of F. E. Myers & Bro., Ashland, Ohio, is now running full force. The firm have made a number of valuable improvements and are better equipped than ever before. They have recently placed a new 15-ton Colliau cupola in their foundry, and refitted the cleaning room with the latest equipments in that line, which will increase the capacity of the foundry nearly one-half.

J. E. Rhoads & Sons, manufacturers of oak tanned leather belting, Wilmington, Del., and 229 Market street, Philadelphia, make specialties of heavy driving belts and Volto dynamo belting, which they refer to as a superior brand and which is treated with their preparation for increasing adhesive power and pliability. They have recently put in several new machines and have a very well equipped shop. They have several power presses, the widest of which will make a 72 inch belt. They also have improved machines for working, stretching and finishing their leather. The firm are also dealers in lace leather, rubber belting, hose, packing, &c.

The American Ormonde Company, New York, will hereafter conduct their wholesale and retail departments entirely independent of each other. The wholesaling will be done at a new depot, soon to be opened in the down town portion of the city, while their retail department will be carried on in their new store, 135 West 125th street. It is understood that the Ormonde wheel will in future be manufactured in this country, and not imported, as formerly.

Mossberg Mfg. Company, Attleboro, Mass., have recently united their Attleboro and North Attleboro plants and added to them by the purchase of additional machinery, so that they now occupy a new building with more than double their former floor area. With a better arrangement of departments and improved methods the company are now in a position to produce any work in their line more satisfactorily and economically than ever before. It is the company's intention in the future to always carry a complete line of jewelers' tools, while still paying particular attention to designing and constructing special complicated and automatic machinery of any kind.

LABOR EXCHANGE.

Notices under this heading of reasonable length are inserted free of charge. Only those relating to employment are admitted. Write distinctly on one side of paper only, and do not use postal cards.

HELP WANTED.

A first-class man as SUPERINTENDENT of stove foundry employing 40 molders; give age, reference, &c. "G. N.," office of *The Metal Worker*, 96-102 Reade street, New York City. Oct. 21

A good all round FURNACEMAN; also a young man as SHIPPER; one of some experience in stove or furnace business preferred. Call, 210 Water street, New York City. Oct. 21

An experienced man to take charge of a stove foundry located near New York; all communications confidential. "Experienced Man," office of *The Metal Worker*, 96-102 Reade street, New York City. Oct. 2

Two good CORNICE MAKERS. Apply to T. W. Corbett, New Haven, Conn. Oct. 21

Experienced man to solicit orders for castings for gray iron foundry doing job work exclusively; a good position for the right man. "Jobbing," office of *The Metal Worker*, 96-102 Reade street, New York. Oct. 21

Will I. B. Schneider, who used to work in Toronto, please write to "T. McD.," 10 Inspector street, Montreal, Canada. Oct. 14

At once, a first-class TINSMITH and GENERAL JOBBER for country shop; must be able to do iron pipe and pump work and have knowledge of plumbing and steam fitting; state wages and experience. Jno. N. Remsen, West Grove, Pa. Oct. 14

A first-class STEEL RANGE MAKER; capable of conducting a shop; new business. M. N. Donnelly, Pittston, Pa. Oct. 14

A first-class TIN and SHEET IRON WORKER; no half plumber and half tinsmith, but a genuine, first-class tinsmith; wages, $3 per day steady the year round. "Steady," office of *The Metal Worker*, 96-102 Reade street, New York City. Oct. 14

SITUATIONS WANTED.

By a good PLUMBER; can read plans; would like a steady position; married; can furnish references; would work on shares; West, South or East; steady and reliable. "R. B. C.," care John Flynn, 331 West Seventeenth street, New York City. Oct. 21

By a young man as PLUMBER; four years' experience in Pennsylvania; would like to be under instructions for another year or so; willing to work, and will furnish own tools. Philip Marten, 2196 Second avenue, New York City. Oct. 21

A complete line of first-class cutlery to sell on commission in New York State direct from manufacturer. Clarence Reynolds, Buffalo, N. Y. Oct. 21

Steady position with some good firm by a practical CORNICE and SKYLIGHT MAKER, TIN, SHEET IRON WORKER; can work from plans, lay and cut out all kinds of work, and do all classes of hammer work by hand; steady and sober; capable to take charge of shop if necessary. "W.," Box 2, 261 Atlantic avenue, Brooklyn, N. Y. Oct. 21

By a practical TINNER of 20 years' experience in all kinds of inside and outside work, furnace, cornice, roofing, dairy and all kinds of piece work; I want to start a first-class shop; will furnish tools and stock if I can get with some good, reliable firm; I am sober and reliable; can furnish good references; Wisconsin, Illinois or Minnesota preferred. "W. E. P.," Lock Box 3, Granton, Wis. Oct. 21

By a first-class CORNICE CUTTER and MAKER in some good shop; patterns cut in the best and quickest manner possible; long experience; references if required. "Pattern Cutter," Box 1021, office of *The Metal Worker*, 96-102 Reade street, New York City. Oct. 21

By a TRAVELING SALESMEN, one who has traveled in the house furnishing goods lines; has traveled East, West and South for the past ten years; also has a good trade in the vicinity of New York and Brooklyn. "E. T. H.," No. 1021, office of *The Metal Worker*, 96-102 Reade street, New York City. Oct. 21

By practical cornice worker as CUTTER or FOREMAN; steady situation desired; can furnish A1 references. "Practical," office of *The Metal Worker*, 220 South Fourth street, Philadelphia, Pa. Oct. 21

A first-class PLUMBER and GAS FITTER, having city and country experience, would like a steady position with a reliable firm; can furnish best of references. "T. J. J.," 4 Almira street, Bloomfield, N. J. Oct. 21

By a first-class PLUMBER who understands his business; would like to go South or Southwest; those in want of a first-class mechanic will learn of such by addressing 126 West Clay street, Richmond, Va. Oct. 21

By a first-class CORNICE MAKER and SHEET IRON WORKER, who is also an all around jobber; can do all kinds of zinc, galvanized iron and stamped work; situation wanted with a first-class firm, where work will be guaranteed the year round. Jno. Arnold, Fort Smith, Ark. Oct. 21

By young man as PLUMBER and STEAM and HOT WATER FITTER and fair tinner; do not want fancy pay, but steady job; can furnish best of references as to honesty and workmanship. Chas. Williams, Box 48, Port Henry, N. Y. Oct. 21

By an all around man on tin and sheet iron work, steam and gas fitting and plumbing. "Plumber," Lock Box 274, Erie, Pa. Oct. 21

By a practical ELECTRO PLATER of over 30 years' experience upon work of every description; have had charge of the polishing, buffing and plating departments of the largest stove works in the United States and Canada. "Electro Plater," 26½ Prosser street, Cleveland, Ohio. Oct. 21

A perfectly capable man guarantees that he is just the one you have been wishing to find as confidential and trustworthy SALESMAN. "Worthy," office of *The Metal Worker*, 96-102 Reade street, New York City. Oct. 21

A competent SALESMAN wishes a staple line of goods to sell in Western territory during the winter; would start out at once. "J. D. F.," office of *The Metal Worker*, 96-102 Reade street, New York City. Oct. 21

As CLERK, by young man, seven years' practical experience in hardware, stoves, paints, house furnishing goods; understands the above in all details; can also do any shop work required; location no objection; first-class references; moderate terms. O. A. Pell, Rochester, N. Y. Oct. 21

Would like to correspond with parties in need of a first-class PLUMBER, SHEET IRON WORKER and FURNACEMAN; can do gas piping. "H. D.," 33 Pleasant street, Attleboro, Mass. Oct. 21

By a first-class SHEET IRON WORKER, a permanent position; experienced in the working of heavy sheet iron and capable of laying out any kind of work. "J. S.," 177 East Third street, New Albany, Ind. Oct. 21

TINSMITH, married, wants permanent job; 20 years' experience in tin, copper, brass and sheet iron work, stoves, furnaces, roofing and general jobbing; country preferred. "Tinsmith," 338 Twenty-second street, South Brooklyn, N. Y. Oct. 21

As TRAVELING SALESMAN with stove manufacturer; best of references; several years' experience. J. G. Allor, Clinton, Iowa. Oct. 21

I want a situation with some good hardware firm in the South or West as BOOKKEEPER and SALESMAN or BOOKKEEPER; best references from present and past employers. "O. C. C.," care of State Board of Agriculture, Lansing, Mich. Oct. 21

A FINIAL MAKER and RAISER, makes his own dies for stamped work, first-class mechanic, married, wants permanent situation; wages must be good. K. M. Dedrick, 112 Adelaide street, Winnipeg, Man. Oct. 21

By a TINNER, SHEET IRON WORKER and ROOFER, used to jobbing, inside and outside. B. Simon, 303 Eldridge street, New York. Oct. 14

In a shop by a general workman as PLUMBER and STEAM and HOT WATER FITTER; some knowledge of tinning; 23 years of age; five years' experience; strictly temperate and steady. "S.," Box 81, Dobbs Ferry, N. Y. Oct. 14

As TRAVELING SALESMAN for manufacturer of steam supplies or specialties; ten years' experience; best of references. "J. W. B.," P. O. Box 744, Philadelphia, Pa. Oct. 14

As SHIPPING CLERK with some good house in Baltimore, Md.; old railroad man, and knows all points in the South; can give best of reference. "H. L. D.," 111 York street, Savannah, Ga. Oct. 14

As TINSMITH, SHEET IRON WORKER and ROOFER; can also do stove, range and furnace work; some knowledge of plumbing and gas fitting. Herman Gold, 19 Chrystie street, New York. Oct. 14

A young man of 19 would like to finish plumbing trade or work under instructions; four years' experience. W. Wadden, 36 Main street, Marlboro, Mass. Oct. 14

Young man, 22, in business in New York, desires employment evenings; good draftsman and rapid writer. "Rapid," office of *The Metal Worker*, 96-102 Reade street, New York City. Oct. 14

A No. 1 PLUMBER, STEAM and HOT WATER FITTER of long experience, thoroughly posted on plans, specifications and estimating; by the year or percentage; best of references. J. A. Bolton, Syracuse, N. Y. Oct. 14

By a young man who has had a course of plumbing in the New York Trade School and is a good workman in lead and can do lead burning and has a machine; good reference. R. S. Sholes, Jr., Norwich, Conn. Oct. 14

Young man, age 17, would like to get a place in plumbing shop, where he could obtain a knowledge of the trade. Charles Laird, 186 Tenth street, Brooklyn, N. Y. Oct. 14

By a STEEL RANGE MAKER of 15 years' experience; can act as SALESMAN. "Range Maker," 103 Ross street, Pittsburgh, Pa. Oct. 14

By an experienced TINSMITH, capable of doing roofing, furnace, heating and range work and general jobbing. Fritz Freeman, 408 Grand street, Hoboken, N. J. Oct. 14

By a TIN and SHEET IRON WORKER and ROOFER. B. Gorden, care Jas. Sheer, 43 Henry street, New York. Oct. 14

First-class TINSMITH, thoroughly competent in the different branches, including plumbing, wishes a steady position at fair wages in Central New York, in shop with fair tools and light. "Steady," Box 202, Fulton, N. Y. Oct. 14

By a young man 26 years of age with 12 years' experience at TIN and SHEET-IRON WORK and ROOFING; furnace work a specialty; can do all kinds of general jobbing. J. Fink, 604 East Ninth street, New York City. Oct. 14

Steady job by a first-class PLUMBER, with a fair knowledge of tin and sheet iron work, roofing and pump work; city or country. "Plumber," Box 266, Hyannis, Mass. Oct. 14

As CORNICE CUTTER, by a practical mechanic of 20 years' experience; situation desired in a good cornice shop. L. W. Cutter, 488 Winchester avenue, Chicago, Ill. Oct. 14

As PLUMBER, TINNER and GENERAL JOBBER in any shop in New England; 12 years' experience; wages $3 a day. G. H. O'Neill, Box 315, East Brookfield, Mass. Oct. 14

By a good TIN and SHEET IRON WORKER; city preferred. "J. J.," care S. Greenwald, 47 Lewis street, New York. Oct 14

By an all around TINSMITH, who would like to work in some large country village. "C. R. T.," Hyannis, Mass. Oct. 14

As SALESMAN with some good stove or crockery house in Baltimore, Md., by a sober man and good salesman; have 15 years' experience in stoves and five years in crockery; can give best of reference. "S. A. C.," 111 York street, Savannah, Ga. Oct. 14

By a young TINSMITH with eight years' experience in country shops; can repair and put up any kind of pump and do jobbing at plumbing; steady situation desired. "F. M.," Box 75, Manhasset, L. I. Oct. 14

By a TINNER with 12 years' experience at roofing, guttering and general jobbing; young man; sober. Box 207, Harrodsburg, Ky. Oct. 7

An experienced man desires position as SUPERINTENDENT of stove foundry; first-class reference given. "Stove Foundry," Box 107, office of *The Metal Worker*, 96-102 Reade street, New York City. Oct. 7

A practical STEAM and HOT WATER FITTER, capable of estimating and constructing work, desires to represent in Philadelphia and vicinity some party or manufacturer of heating specialties, or would take the agency for, and push the sale of, some special goods of merit in the heating or plumbing line, on commission or salary; reference and security if necessary. "W. C.," office of *The Metal Worker*, 220 South Fourth street, Philadelphia, Pa. Oct. 7

By a WOOD and METAL PATTERN MAKER who is also a molder by trade, and a first-class wood turner; can do a fair job at tinning; worked for Seymour & McIntosh until they shut down; best of references. Madison Vorce, 15 Wood street, Auburn, N. Y. Oct. 7

By a METAL PATTERN MAKER who can file, fit and ornament stoves, originate patterns or repair same. "J. P.," 11 Delevan street, Auburn, N. Y. Oct. 7

Special Notices.

SALE OF VALUABLE PROPERTY of the corporation known heretofore as The Albany Stove Company. Whereas, by order of the Supreme Court of the State of New York, granted in the City of Albany, N. Y., on the 10th day of October, 1893, the undersigned, receiver of the assets and effects of the corporation known heretofore as The Albany Stove Company, was directed to offer for sale the following described property, viz.: The real estate and buildings owned by the said corporation "The Albany Stove Company," situated on Tivoli street, in the City of Albany, N. Y., being the same premises used by the said corporation in carrying on its business of manufacturing stoves and iron castings, and is the same real estate conveyed by Eugene Van Rensselaer and others, as executors, etc., to The Capital Co-operative Foundry Company, by deed dated October 15, 1869, recorded in Albany County Clerk's office, December 15, 1869, in Book No. 228 of Deeds, on page 241, and by Van Rensselaer Land Company to Albany Stove Company by deed dated January 10, 1890, recorded January 14, 1890, in Book No. 412 of Deeds, on page 318, together with the machinery, tools and implements used in carrying on the business above referred to.

Now, therefore, in pursuance of said order, the undersigned offers for sale to the highest bidder the property above described.

All bids to be sealed, and must be distinctly marked on the envelope in which they are enclosed, "Bids for property of the Albany Stove Company," and addressed and delivered to the undersigned at No. 82 State street, Albany, New York, on or before the 17th day of November, 1893. The right to reject any and all bids is hereby reserved, and sale can only be completed upon order of the court.

Bids will be opened by the receiver at the office of Francis H. Woods, No. 116 State street, Albany, New York, on Saturday, November 18, 1893, at 10 A.M. Terms, purchase price to be paid within twenty days after notification of acceptance of bid.

Dated October 11, 1893.

JOHN GUTMANN,
Receiver of The Albany Stove Company.

SALE OF VALUABLE PROPERTY of the corporation known heretofore as The Albany Stove Company. Whereas, by order of the Supreme Court, granted in the city of Albany, N. Y., on the 10th day of October, 1893, the undersigned, receiver of the assets and effects of the corporation known heretofore as The Albany Stove Company, was directed to offer for sale the following described property, viz.: The patterns, shop rights and flasks owned by the said corporation, and being the patterns, shop rights and flasks for the "Home Yale" parlor and range, "Yale" cook, "White Oak," "Art Yale Range," "Rose" range, "Oneida," and for other castings, formerly manufactured by the said corporation, a more particular description of which will be given on application to the undersigned.

Now, therefore, in pursuance of said order, the undersigned offers for sale to the highest bidder the property above described.

All bids to be sealed and must be distinctly marked on the envelope in which they are inclosed, "Bids for property of The Albany Stove Company," and addressed and delivered to the undersigned, at No. 82 State street, Albany, N. Y., on or before the 17th day of November, 1893.

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Dated October 11th, 1893.

JOHN GUTMANN,
Receiver of The Albany Stove Company.

FOR SALE.

An old-established Stove and House-Furnishing business, with tin shop, will be sold cheap. Satisfactory reasons given for wishing to sell. all at or address

84 Main St., North Adams, Mass.

FOR SALE.

Plumbing, Stove and Tin Business in the growing town of Greenfield, Mass. Very clean stock. Address "GREENFIELD," office of *The Metal Worker*, 96-102 Reade street, N. Y.

WANTED.

Second-hand National Cash Register.
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Clinton, Ill.

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Paste Stove Polish at 4 to 6 Cts. per Pound.
Guaranteed the best. None better.
Send for circulars.
YATES & CO., Rockford, Ill.

Special Notices.

WANTED.

By a young man not afraid of work, an opportunity to represent some manufacturing concern who would like to open a branch store or office in Boston for the sale of their goods in this vicinity. Best of references given. Address "A.," office of *The Metal Worker*, 146 Franklin street, Boston, Mass.

Manufacturers of Gasoline Stoves,
ATTENTION!

A new starting device for gasoline burners. No experiment, but a practical invention thoroughly tested and "Patented Jan., 1893." For information address

BORZELL & BARDSLEY,
1925 Germantown Avenue, Philadelphia, Pa.

BUSINESS MANAGER WANTED.

The present manager of The Weir Furnace Company, Des Moines, Iowa, being about to re engage in other business, a successor is wanted for the position. An experienced business man, with moderate capital, will be given entire charge of the business. The present stockholders are all actively engaged in other lines; an associate fully competent is therefore necessary. The company's reputation is first class, its furnace a superior one and the business profitable. References of the highest class given and required. A vigorous man, young or middle aged, desired. Address J. E. CLAREY, Sec'y and Treas., Des Moines, Iowa.

FOR SALE.

Good Stove and Tin business, located in Somerton (35th ward), Philadelphia, on "Bound Brook Route," 15 miles to 12th and Market Streets, and about same distance from Trenton, N. J. Growing country and plenty of work to be had. Good place for a live Tin worker with little capital. Excellent reasons for selling. Address

P. T. LEWIS,
Somerton, Philadelphia, Pa.

FOR SALE.

A well-equipped stove foundry, located in the iron region of the South; has been in operation ten years; the buildings and machinery are new, having been erected on a new site recently, the patterns are of good salable stoves; it is located on three trunk lines and a navigable river and in one of the largest cities of the South; the present owners will agree to take half of the output; terms, one-third cash and balance can be paid in product of the foundry in two or three years. Owners have other interests which engage their attention. For further information address

"STOVEMAN,"

care of JAMES J. SMITH & CO., 119 Dearborn St., Chicago, Ill.

FOR SALE.

Having purchased the patterns, tools and the business of the Hotel Car Range Co., we have a complete set of tinners' and sheet iron tools and such as required for a range shop. Both hand and power bending machines, power drills, &c. Will sell cheap, apply

BRAMHALL, DEANE & CO.,
79, 81 & 83 Market St., Chicago, Ill.

FOR SALE.

As I wish to retire from business, I offer my stock of Hardware and Stoves of about $10,000 for sale. A splendid paying business; will stand the very closest investigation, and a chance of a lifetime. Situated in a lively town in Wisconsin. Don't answer this unless you mean business. Address "BUSINESS," office of *The Metal Worker*, 59 Dearborn street, Chicago.

FOR SALE.

A valuable Stove Plant, comprising stoves, ranges and heating stoves, wood and iron patterns, flasks and fallow boards, carrying with it a large repair trade, sufficient to pay for plant in short time. Address

"INVESTMENT,"

office of *The Metal Worker*, 96-102 Reade St. New York.

!!! FOR SALE !!!

BAKER BLOWERS, Nos. 1, 4½, 5, 6 and 7.
ROOT BLOWERS, Nos. 1, 2, 3, 4, 5, 6 and 7.
Sturtevant Blowers. Nos. 4, 5, 6, &c.
1 Corliss Band Wheel, 12 ft. x 24 in., in halves.
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THE METAL WORKER.

NEW YORK AND CHICAGO.

Saturday, October 28, 1893.

DAVID WILLIAMS, - PUBLISHER

BUSINESS OFFICES:

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Trade Schools in Philadelphia.

In another column will be found an interesting communication from William A. H. Allen, the superintendent of the Master Builders' Mechanical Trade Schools in Philadelphia, in which he gives a good report of the past work of that institution, and of the prospects for the fourth term, now in session. It will be remembered that the late Colonel Richard T. Auchmuty of New York contributed to those schools the sum of $3000 a year for the first three years, in order to give them a fair start. This sum nearly covered the expenses of tuition, cost of materials, &c., over and above the fee of $27 charged to each pupil. But as Colonel Auchmuty's contribution has now ceased, the members of the Master Builders' Exchange are making strenuous efforts to raise an endowment fund for the schools. At their quarterly meeting, held on Tuesday, the subject was brought up, and the sum of $10,000 was asked for, of which $5500 was promptly obtained. Resolutions were also adopted asking the city of Philadelphia to make an annual appropriation sufficient to cover the running expenses of the schools, on the ground that they are doing a most useful public service in educating American boys in useful trades, over 300 young men having there been taught the rudiments of carpentry, blacksmithing, plumbing, bricklaying, plastering or painting since their establishment. The schools have so far proved a success, and it is to be hoped that adequate provision may be found for their maintenance and extension.

Sheet Metal Pattern Cutting.

Mr. Allen expresses his regret that it has not yet been found practicable to start a class for instruction in sheet metal pattern cutting, this being a subject for which a considerable demand exists in the trade, if we may judge by the inquiries we have received in relation to it. The matter has, we know, been under consideration by the managers of more than one of the existing trade schools, but hitherto it does not appear to have materialized, for various reasons, such as those offered by Mr. Allen. We are, however, happy to call attention to the announcement made in another part of this paper as to the possible inauguration of a class for sheet metal pattern work in connection with the trade school of the Pratt Institute, Brooklyn. Such a class will be formed there, provided there is a sufficient demand for it from the younger members of the trade.

Accident Record for 1893.

The record of railway accidents in the United States for the current year has been unusually large. The number and character of these accidents indicate that the general standard of efficiency in railroad practice has not been maintained. Has this state of things any relation to the financial situation? A curious inquiry might be instituted with a view to ascertain how far such epidemics of accidents as have been recently experienced are related to false economies practiced under financial stress. But the prevalence of killing and maiming and the destruction of valuable property have not been confined to railways. The list of bursting fly wheels and of injuries in shops and manufactories is this year a formidable one. Some of these have been peculiar as regards the circumstances under which they occurred.

Gas Accidents.

Two destructive as well as instructive accidents, one in the city of Brooklyn and the other in New York, have quite recently occurred. In Brooklyn a small lad poked an ignited piece of wood through a hole in a sewer manhole cover, and the result was an immediate explosion of illuminating gas which had escaped into the sewer from leaking gas mains. Fifty feet in length of a large sewer were thus blown up. Fortunately, however, no one was killed, though a number of people were injured. The incident illustrates how modern improvements, apparently of an innocent sort, may secretly create unseen and unsuspected dangers. The accident in New York terminated more fatally. Three policemen, accompanied by another man, entered a toilet house in Central Park to take a comfortable snooze in the night time. Through the sewer connections illuminating gas, leaking from mains into the sewer, passed up into the house in such quantity that three of the men were killed by breathing it, and the fourth was taken to a hospital nearly dead. This illustrates a possible danger arising from leakage of gas into sewers that is rarely suspected by people in general —the escape into buildings from unguarded sewer connections of illuminating gas issuing from defects in city gas mains.

Risks Attending Changes.

The use of improved methods is nearly always attended with some new risk. Much has been said concerning the risks attending the introduction of modern electrical devices. Perhaps nothing too much has been written and published about the trolley system of street railroading, which has been subjected to a storm of deprecation. The more the real dangers, as well as the imaginary ones, are discussed and protested against, the greater is the probability that measures tending to reduce risks will be adopted. But if the number of injuries received by patrons of this system be compared with the total number of passengers carried, this method of car propulsion will not make a bad showing, this year at least, with the steam railways.

The World's Fair Closes October 30.

The managers of the World's Columbian Exposition have acted wisely in deciding to close on the 30th inst. This is the day which has been set for the termination of the fair from the time when the preliminary arrangements for the enterprise crystallized into definite announcements. It is not surprising that the enormous increase in attendance which has characterized October should have inspired many individuals interested in the affairs of the exposition to plan for its prolongation beyond the official date of closing. They are so numerous and influential that at one time an apparently authorized statement was published that the fair would be continued as far into the winter as the weather would permit, and that next year another six months' fair would be held on the exposition grounds, even if it were confined entirely to domestic exhibits. The legal advisers of the management, however, promptly showed that there were many obstacles in the way in the nature of legislative enactments and innumerable contracts, all based on an early termination of the existence of the enterprise. Complications of an apparently insurmountable character were thus set forth, and enthusiastic advocates of prolongation became convinced that their plans were not feasible. This is well, as it would be a reflection on the splendid management of the fair hitherto if it were to be permitted to run until it simply "petered out" as it would assuredly do. A general feeling of regret is ex-

perienced that the magnificent architectural effects of the exposition buildings cannot be preserved. If it were possible to permit the buildings to stand as they are, there is no doubt that they would prove a great attraction to strangers visiting Chicago who have not had an opportunity to attend the fair. But there are many reasons why even this cannot be done. The buildings will be demolished and every vestige of them removed at as early a day as possible, and their beauty will then only be a memory.

As Foreigners See Us

Thousands of foreigners have visited the United States for the first time this year. The majority of them are men who are fairly prosperous at home. A few of them are professional exhibition visitors, and a small number are people of leisure traveling to escape boredom. With these few exceptions they are professional and business men who have come to study for themselves the resources and the methods of work of this country. The last few decades have opened the eyes of Europe to our development, and the appearance of American products in many branches of commerce and industry has foreshadowed threats of rivalry from the rapidly growing Western giant. Reports of the impressions thus gathered are becoming numerous in the European press and are not altogether flattering. Many of them are crude, and others are tainted by a spirit of fault finding Some of our foreign visitors have failed to grasp the fact that conditions are not the same on both sides of the Atlantic, and that what may be good practice there would be an unprofitable method here. Still, honest criticism and kindly comment should be carefully considered by the victim.

One of the things which seem to have struck our visitors is the worship of bigness in America. The one thing which we are accused of never failing to urge with pride is the magnitude of what we show. They are struck by our love of inspiring awe rather than admiration. Our eagerness to dwell on numerical maxima astonishes and amuses them. To them there is little merit in the "biggest thing in the universe." Mere magnitude in their estimation fades into insignificance as compared with the merit of finished excellence and beauty. Unprejudiced Americans will admit that there is a good deal of truth in that criticism, but they will at the same time acknowledge to themselves that in that respect we are not now really quite as bad as we were.

Another matter which foreign visitors are apt to refer to is coupled with the utilization of our enormous resources. We have often observed that a feeling akin to envy pervades their study of our natural advantages. But the one point raised, particularly by the thrifty men from the Continent, is the reckless and often criminal wastefulness which characterizes so many of our operations. Our skinning of the soil, our savage inroads into our forests, the careless destruction for further use of much of our mineral treasures, our neglect in utilizing waste products and old materials, are astounding to them, and at times give rise to indignation and disgust. They point out that we are quick to adopt some makeshift and go on renewing it at frequent intervals rather than spend the money for one lasting structure. The same lavish extravagance pervades the whole community from the laborer to the captain of industry. It obtrudes itself upon the foreigner in private, municipal, national and industrial affairs, and is to him our greatest reproach and our most serious source of danger.

Let it be conceded that it may pay to waste, that posterity has no rights which the living are bound to respect, and yet, with all that eliminated, the criticism that Americans are wickedly wasteful remains only too true. It cannot be contemptuously waved aside as a proof of a mean spirit. We believe that, on the whole, it is one of the principal sources of comfort which has come to those Europeans who have studied our capacity as rivals in the early future. They frankly say that as long as we go on in the extravagant manner apparently habitual with Americans, high and low, they need not fear us as competitors. It is possible that the very sharp lesson which is now being taught us will rid us earlier of a national sin than our foreign friends anticipate.

Sheet Mill Wages.

When the iron and steel roofing business, says *The Iron Age*, commenced its rapid development into a very important industry some 12 years ago competition became brisk, and in order to compete successfully many roofers decreased the weight per square foot of flat sheets used without changing the gauge marked thereon, so as to keep their cost down and even up on the reduced prices at which their finished goods were sold. According to the old standard No. 27 used to weigh 72 pounds per square, flat, but it was reduced to 68 pounds, 66 pounds, and finally to 64 pounds. When the lowest figures were reached the Iron and Steel Roofers' Association condoned the sin of their brethren by adopting a new standard, taking Haswell for authority. According to the new table of weights No. 27 was made to weigh $\frac{64}{100}$ pound per square foot, but according to the rolling mill table of weights as printed in the agreement entered into with the Amalgamated Association of Iron and Steel Workers sheets rolled to this weight should be classed as No. 28 gauge, and upon that basis the mills of the Wheeling district have always paid their rollers. When the Roofers' Association established their weights attempts were made to get $\frac{64}{100}$-pound sheets rolled at No. 27 price, but the workmen objected and have always received the full No. 28 gauge price, which was $10.40 per ton. Pittsburgh mills also made settlements on the same basis, but many mills outside these two districts succeeded in getting $\frac{64}{100}$-pound rolled for No. 27 price, $9.60 per ton, thus gaining an advantage of 80 cents per ton over some competitors, while the scale of wages signed was in each case identical. Since July 1 the legal standard of weights for various gauges of iron and steel sheets has become the basis of settlements and No. 27 now weighs $\frac{68}{100}$ pound, the price for rolling the same being $10 per ton. This change places the mills that formerly paid $9.60 for No. 27 gauge in a worse position than they were prior to July 1, as they now pay $10 for rolling $\frac{68}{100}$ pound whereas they used to get $\frac{64}{100}$-pound rolled for $9.60, a difference of 40 cents per ton. This is the principal concession known to have been made. In explaining the matter workmen will say that they were ignorant of the exact weight of the sheets they were rolling, but such a statement does not destroy the fact. In like manner many other concessions were made (with a wink) when mills were able to secure large orders for sheets rolled to special weights which came between two gauges of the recognized table. Although contrary to the rules of the A. A. of I. and S. W., one instance is known where No. 27½ gauge was paid, half the difference between No. 27 and No. 28 being added to the price of No. 27. This occurred at an isolated mill. It is right that concessions of this kind should be made between employers and employees, provided neither side belongs to an organization, but when organization does exist and both manufacturers and workmen are supposed to be placed upon an equal basis in their respective competition, the basis should be maintained or organizations should be disbanded and local agreements govern the matter of prices to be paid for labor.

C. R. Richards, director of the Department of Science and Technology in the Pratt Institute, Brooklyn, has been appointed chairman of the section on manual training of the Department of Pedagogy of the Brooklyn Institute. It was under Mr. Richards' direction that the trade schools attached to the Pratt Institute were organized and to him is due the credit of their development into the present state of efficiency.

The comparative value of the hands and fingers has been estimated in a scale supplied by the miners' unions and miners' insurance companies of Germany. The loss of both hands is reckoned as a depreciation in working capacity of 100 per cent.; of the right hand, 70 to 80 per cent.: left hand, 60 to 70 per cent.; thumb, 20 to 30 per cent.; right forefinger, 14 to 18 per cent.; left forefinger, 8 to 13.5 per cent.; third finger, the least in value, 7 to 9 per cent.; little finger, 9 to 12 per cent. The range in percentages is due to the difference in occupation.

A method has been invented in Germany of covering tissues of cotton yarn with a flexible and brilliant deposit of tin. A clear paste of commercial zinc powder and white of eggs is first made and spread on the textures with a brush, the coating coagulating when drying. The tissue is then placed in a bath of perchloride of tin, which metal is precipitated on the zinc; and the article, after rinsing and drying, is calendered, an operation imparting luster to the layer of tin.

PLUMBING and GAS FITTING.

The Leading Principles of Scientific House Drainage and Sanitary Plumbing.—III.

By Wm. Paul Gerhard, C.E.

VIII. — DURABILITY, EFFICIENCY AND CONVENIENCE.

A further principle is that of durability, efficiency and convenience of the plumbing work. All materials, pipes, traps, fixtures and appurtenances should be the best obtainable consistent with due economy, and all parts of the work should be so put together as to require a minimum of repairs. In this matter of subsequent repairs in particular the modern exposed accessible plumbing work differs strongly from work as usually done in the past.

In order to be efficient a house drainage system should be so arranged as to effect a complete, rapid and as far as possible automatic removal of all liquid and semi-liquid wastes. In the traps and pipes everywhere all stagnation of water and air should be avoided.

Furthermore, to be thoroughly efficient, soil and drain pipes, waste pipes and traps should be restricted in diameter, should be run with perfect alignment, avoiding all unnecessary offsets, sharp bends and right angled connections. The water supply system, on the contrary, to be efficient must be constructed with pipes of large size, to give a good flow of water at every fixture in the house. In like manner all shut off valves should be of the full bore, so as not to restrict the waterway. Gate valves should be used in preference to globe valves (except possibly where the water is very gritty) and round way stop cocks in preference to the ordinary kind which have a reduced cross sectional area.

The same principles apply to the pipes for the distribution of illuminating gas. Sound gas pipes, properly welded and put together with galvanized fittings, should be employed, and in order to supply ample volume of gas to the gas burners for efficient illumination the pipes should be of large bore.

Plumbing fixtures, in order to be efficient and convenient, must be quick emptying, must have no large fouling surfaces and should be without mechanical obstructions of any kind. There are numerous kinds of waste valves for sinks, basins and bathtubs, and it is true of these appliances as well as of water closets that the simpler they are constructed the more efficient will they prove in actual use.

Of water closets there are a number of different types. It would lead me too far to consider in detail the requirements of a good water closet apparatus. Suffice it to say that all mechanical types—*i. e.*, those having more or less complicated mechanical apparatus to effect a discharge—stand self condemned. To these belong the old-fashioned pan or Bartholomew closet, the valve or Bramah closet, and the plunger or Jennings type of closet. Equally bad, because liable to become befouled, are long hoppers, with oval bowl and whirl flush (so-called Philadelphia hoppers). The only good and efficient types are flushing rim, straight back long hoppers and flushing rim short hoppers, the wash out closets and the wash down closets, the syphon jet and the syphon closets. The wash out closets, both of the front and back outlet type, have in practical use developed a number of defects, such as fouling the outlet shaft, the insufficient depth of water standing in the bowl and the incomplete flushing of the trap. I venture to predict that they will rapidly go out of use. My decided preference is now and has long been for wash down, syphon jet and syphon closets.

IX.—NOISELESSNESS IN OPERATION.

The principle of noiselessness in operation requires in the supply system that all service pipes be free from water hammer, that ball cocks in cisterns fill the same without hissing or roaring noise, that kitchen boilers do not rumble when overheated, and that the faucets deliver water without sputtering and noise.

In the soil and waste pipe system this principle requires that the sound of flowing water be not transmitted to the occupants of rooms. This easy transmission of sound forms, perhaps, the only objection to the free exposure of soil and waste pipes, and it must be conceded that it is not easy to overcome the drawbacks incident to such arrangement.

The discharge of modern flushing rim water closets is generally accompanied with more or less disagreeable noise, due to the falling water and escape of air in the flush pipes. There are, however, ways in which this defect can be obviated, and some of the best types of approved sanitary closets and flushing cisterns are made comparatively noiseless in action.

All plug, waste valve or stand pipe fixtures, such as washtubs, bathtubs and wash basins, having large outlets cause more or less noise in emptying, due to the sucking in of air into the waste pipe, and this is another minor fault inherent to some of the best modern plumbing appliances which it has not been possible to overcome readily in all cases.

X.—PREVENTION OF WATER WASTE AND OF FREEZING.

The importance of the principle that there should be in a good system of plumbing no useless waste of water should not be underestimated. In the supply system, at faucets and valves and cisterne, as well as at fixtures, this requirement should be observed, and no leaky faucets or ball cocks should be tolerated. Much waste of water is incurred where drinking water is drawn at faucets in summer time, by letting the water which has laid in the pipe system flow off unused. For this reason it is well always to keep hot and cold water pipes suitably far apart, particularly where such pipes are carried in a boxed up casing. Again, where it is desired to draw hot water, much water is uselessly wasted by letting the hot water run in systems where no hot water circulation pipe is provided. It is, therefore, true economy, wherever a hot water supply is provided, to run from the highest fixtures on each line a circulation pipe back into the hot water boiler, so as to keep up a continual flow and circulation. The circulation pipe must, of course, be carefully graded, and if properly arranged will enable a person to draw at once hot water at any fixture in the house.

Water waste also occurs in winter time where the water is kept running to prevent the freezing of the pipes; but in a well arranged system due care is taken to locate all supply pipes in positions where they cannot freeze; thus pipes are never run along outside walls, and where they are of necessity exposed to freezing, pipes are carefully protected with some approved non-conducting covering.

XI.—ABSENCE OF COMPLICATED MECHANISM.

A leading requirement in modern plumbing and drainage work is the absence of all manner of complicated mechanism liable to derangement and to fouling or giving rise to obstructions. Thus, a good water seal trap is considered preferable to the numerous mechanical trap seals, whether flap valves, floating balls, gravity sealing appliances, &c. For the same reason, the hinged pan in the pan closet, the flap valve of the valve seal closet, the plunger of the plunger type of closet, are recognized as objectionable and detrimental. In automatic flushing appliances preference is rightly given to syphons without movable parts.

Finally, with wash basins, bathtubs, and pantry sinks, the form of waste plug and overflow known as the "standing overflow" is generally preferred, from a sanitary point of view, to fixtures with more complicated mechanism, and it can safely be asserted that in practical use such standpipe overflows are quite as convenient as other more complicated arrangements.

XII.—CLEANLINESS AND PURITY.

This last requirement applies in particular to the fixture system and the method of trapping their waste pipes. It involves the entire exclusion of all manner of miniature cesspools of containers or enlarged chambers liable to retain and accumulate foul matter. The old fashioned pot trap, as used under wash basins, bathtubs and sinks, and the still worse D-trap, as used under water closets, are illustrations of such faulty methods, defeating every endeavor to obtain cleanliness and purity. Pan closets, valve and plunger closets, and all kinds of unsanitary waste valves and concealed overflows which never receive a flushing and cannot be properly cleaned, also belong to this class of defects, to which we might add the safe drip pipes as usually found under incased fixtures.

The principle of cleanliness as applied to the pipe system signifies that after construction all pipes be suitably cleaned and finished off. The drain pipes should be neatly painted with metallic or enamel paint or else varnished, all supply pipes should be left

without tool marks and covered with silver, gold or aluminum bronze, and all holes in walls, partitions, ceilings and floors should be properly closed by the plasterer and carpenter. This is quite important in order to prevent any upward currents of air and the passage of foul odors along soil or waste pipes from floor to floor.

Much depends, finally, upon the proper maintenance and care of plumbing apparatus in a household after it is put in use, but it must suffice to merely mention this subject here.

TESTS OF PLUMBING AND HOUSE DRAINAGE.

Having carefully applied the principles enumerated above in the planning and execution of the drainage and plumbing of a building, it becomes desirable to obtain some positive knowledge or proof of the soundness and safety of the work. This is now accomplished by a series of tests, which in any work, whether small or large, should always be carried out. Similar tests are applied in old buildings wherever there is any doubt or suspicion as to the condition of the drainage or the healthfulness of a house.

These tests may be conveniently considered under the following headings—viz.:

(*a*). Tests of the materials.
1. Pipes and fittings.
2. Traps.
3. Fixtures.

(*b*). Tests during construction.
1. Soil pipe system.
2. Supply system.
3. Gas pipe system.

(*c*). Tests after completion.
1. Soil pipe system.
2. Supply system.
3. Fixture system.

(*d*). Tests of old plumbing work.

The tests of the materials employed in plumbing work are usually applied by the manufacturers, but it is important that the contractor, in buying the materials, secures a guarantee that the tests have been actually applied. Thus cast iron soil pipe and fittings are tested at the foundry by a hydrostatic pressure and a hammer test, wrought iron pipes for water and gas are similarly tested at the pipe mills. Valves, faucets, traps, brass ferrules and other fittings should be inspected and proven. Finally, a test should be applied to the fixtures, particularly to the earthenware water closets, many of which are turned out at the potteries in a defective condition as regards the flushing rim or the syphon jet.

During the construction of the plumbing work the soil, drain, waste and vent pipe system should be tested, by filling the pipes with water (water test), or by applying a test with air force pump and mercury gauge (air pressure test). Defects in material as well as in workmanship are readily discovered by both tests. My preference is for the water test, which, although severe, is very positive in its indications and less troublesome in application than the air pressure test. It can be applied at all times, before the fixtures are set, except during freezing weather.

It is important to include in this test the branch waste and vent pipes which are connected to the main lines with brass ferrules and calked joints. Indeed, it is advisable to set all lead bends for water closet branches, and also where practicable the lead or brass traps under the fixtures, before applying the test. Where this is done—and I have in many cases in my own practice been able to carry this out—that entire part of the plumbing system which may contain sewer air up to and including the traps is put under inspection and test, with the only exception of the floor joints of earthenware closets, which must be left out and can only be tested by the air, peppermint or smoke test.

It is equally important to test the supply pipe system in a building before the fixtures are connected and the water turned on. The test should subject the pipes and fittings to a much heavier pressure than they are likely to carry in actual use. Thus water pipes and fittings should be tested by a water pressure test with pressure pump and gauge up to from 50 to 100 pounds per square inch, according to the pressure which will obtain in the pipes when in actual use.

The gas piping system should likewise be tested under a severe pressure, and in my own practice I always insist upon an air pressure of from 15 to 18 inches in the mercury gauge, and do not consider the piping tight if the mercury column falls more than from ½ to 1 inch in an hour, this depending upon the extent of the piping system under test.

When the plumbing work of a building is completed it is desirable to apply further tests. The drainage, trap and fixture system should be tested by applying either a smoke test or a pepper mint test, which would help to discover leaky floor joints of water closets, or defective joints at nickel plated brass couplings, or traps which have lost their water seal by tipping, or holes in lead pipes caused by driving nails and the like. The water supply system is tested by turning on the water at all fixtures, by regulating the ball cocks in cisterns so as to work noiselessly and without spattering, by repairing dripping faucets, leaky stuffing boxes of shut off valves, &c. Finally, the operation of the fixtures is tested, particularly the flush of water closets, urinals and slop sinks, also the proper and quick emptying of bathtubs, sinks and lavatories, and the automatic action of syphon or other flushing appliances.

It would lead me too far to describe in detail the proper methods of inspecting and testing old plumbing work. The tests usually applied in such cases are the peppermint, the smoke test and sometimes an air pressure test. The water test is not practically applicable to plumbing work in actual use, because it necessitates the disconnection of all fixtures, and even then it is somewhat risky to apply, owing to the possibility of flooding parts of the house and damaging furniture, carpets and valuable interior decorations in case there are leaks.

The peppermint test is useful in a measure, but unless great care is taken in its application its results are at times misleading. Therefore, it is in the hands of inexperienced or unscrupulous persons a rather dangerous and objectionable test. It is not always possible to locate by the peppermint test the exact position of the leak, or to determine exactly what the defect is. On the other hand, in the more positive smoke test any leakage becomes apparent to the sense of both smell and sight, in fact in nearly all cases, except where leaks are very slight, the issue of smoke will indicate the exact point at which plumbing is unsafe.

Perhaps it is well to mention that in order to have continued assurance that the plumbing and drainage remain safe, it is advisable to repeat such tests from time to time. Walls of a building may settle, pipe joints may become untight, or joints may open by expansion where much hot water passes through the waste, or else pipes may break, or traps may sag or tip over, rubber gaskets of floor joints may disintegrate and rot, leaving open cracks through which sewer air may pass, or joints made with brass couplings may become loose; in short, there are numerous points which in a plumbing system may become defective after being in use for some time. Hence the necessity of periodical reinspection, which is just as desirable with plumbing work as it is with steam boilers or other machinery.

In locating and arranging the drainage and plumbing work in a modern building—be the same a dwelling house, an office building, a warehouse or factory, a church or school house, a theater or club house, a hospital, railroad station or what else—architects should constantly bear the above principles in mind.

The details of the plumbing work may vary, the choice of the supply system and the selection of the fixtures best adapted to each class of buildings may be a matter requiring skillful treatment and the exercise of good judgment in each case, and in these respects each building may present a problem in itself, yet the general requirements as to planning, location, materials, workmanship and arrangement remain the same.

It has become quite a general practice in some of the leading architects' offices to have this part of the work looked after—from its conception to its execution—by a specialist, and house owners are gradually becoming convinced of the utility of such a plan.

It has been my good fortune in the past years to have been associated with many prominent architectural firms in this branch of domestic engineering, and I have always in the preparation of the plans and specifications, as well as in laying out the work in the building, endeavored to make the plumbing work conform to the above outlined requirements or principles. The results due to the advanced standpoint taken have been invariably satisfactory to the owners. Not only did the work prove a success from a sanitary point of view, but repairs to plumbing work so arranged have been few, and where required they have been much less costly and annoying, owing largely to facility of access and simplicity of arrangement.

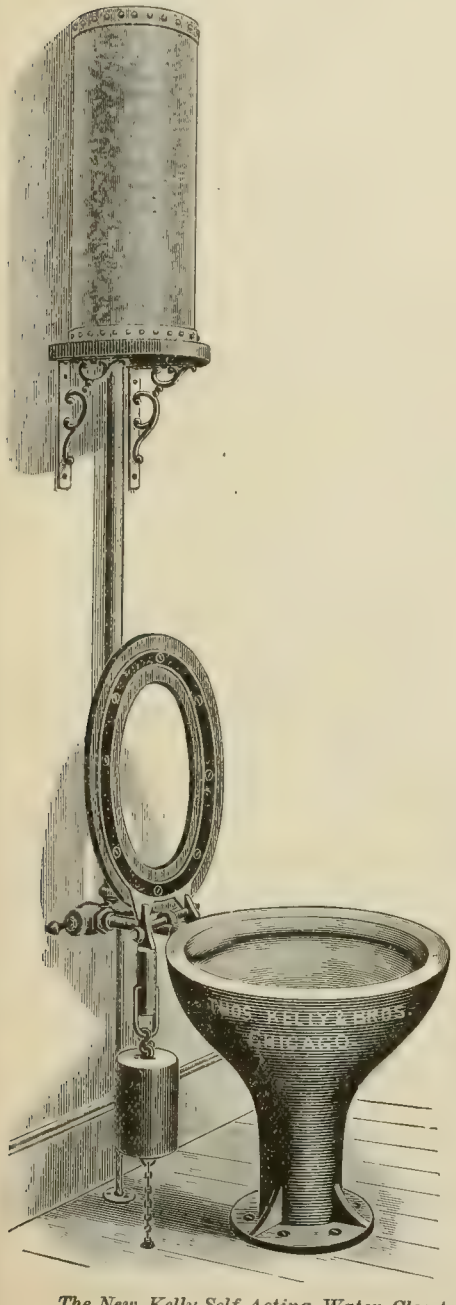
(THE END.)

G. W. Davis Plumbing Company.

G. W. Davis of the G. W. Davis Plumbing Company, El Paso, Texas, called at our Chicago office the past week while in the city visiting the fair. A photograph of the interior of his store, left as a memento of his visit, shows a remarkably fine room, fitted with modern plumbing devices in a very tasteful manner, and in every way superior to what would be expected in that remote part of the country. We take from a recent issue of the El Paso *Times* a reference to some work just completed by his company:

G. W. Davis has just completed one of the largest plumbing contracts ever undertaken by any one establishment in this city. We refer to the water supply plant and plumbing of Government buildings at the new post, Fort Bliss, which was begun in September, 1892, by the then firm of Davis & Symons, but was continued on the dissolution of the partnership by Mr. Davis on his own account. The work

performed by Mr. Davis consisted in laying about 1¾ miles of cast iron water mains, together with all the valves, hydrants, &c., pertaining to the underground distributing system, furnishing, setting up and putting in running order the steam pumping machinery, consisting of two 40 horse-power boilers and two 30 horse-power pumping engines, and furnishing all the material and services required in the plumbing of all the buildings at the post, 20 sets of officers' quarters and non-commissioned staff officers' quarters, stables, storehouse, guard house, mess hall and administration building, outbuildings for two double barracks for four companies of troops, and the post hospital. A conception of the magnitude of the work performed by Mr. Davis may be gained from the fact that his contracts involved an expenditure of nearly $36,000. The fact that his work has been accepted after the rigid inspections and severe tests to which it has been subjected is sufficient assurance that it was well done.



The New Kelly Self Acting Water Closet.

CHARLES HAGGERTY of Huntingdon, Ill., has moved his plumbing shop to the *Herald* building.

The New Kelly Self Acting Water Closet.

Thomas Kelly & Brothers, 123 Franklin street, Chicago, are putting on the market an improved form of water closet, which is herewith illustrated. The manufacturers claim that before introducing this closet precautions were taken to make it as simple and devoid of complications as possible, so no more skill would be required in setting than in connecting an ordinary garden hose. The flush tank and pipe are galvanized, and all parts shown in the engraving are furnished with the closet. There is no regulating of parts required, or no way possible for an unskilled workman to put the closet up wrong. The water supply to valve is arranged for either lead or iron pipe, as may be required. In case it is desired to place the valve below the floor instead of in the position shown, the chain that passes through floor can be attached to the valve. The flush tank is simply an air tight chamber without any movable parts, and the connections are so made that it will fill as far as the pressure of water will compress the air. The seat being released, the water causes it to rise, and at the same time opening the valve, water is allowed to flush the hopper. The valve is self acting, being closed by water pressure. As the weight tips the seat up when not in use the closet can be used as a slop sink or urinal, and on account of the seat being pivoted to the flush pipe convenience in setting is obtained.

Massachusetts Plumbing Regulations.

From H. H. W., *Taunton, Mass.*—Please inform me through *The Metal Worker* where I can obtain a copy of the Massachusetts plumbing regulations passed by the State Legislature some time in June or July?

Note.—In *The Metal Worker* of July 29, page 50, we made extensive reference to the Massachusetts plumbing law, giving its important provisions. Our correspondent probably can get the full text of the law by applying to the Secretary of State, Boston, Mass.

TRAPS AND VENTS.

CAHILL BROTHERS, Utica, N. Y., issue an interesting little catalogue and price list of the P. J. Cahill Universal closet seat. The circular, of 20 odd pages, contains many illustrations of closets and separate views of the seat, together with full description; also a considerable number of testimonial letters from those who have used the Universal closet seat with satisfactory results. A special feature of the seat is that it can always be adjusted to fit the closet bowl before the bowl is set up and when desired before leaving the shop. It is further mentioned that when the closet is set in place the seat can be attached to the bowl in less than five minutes.

IN THE SINKING of the steamer "Dean Richmond," which recently occurred with the loss of many lives on Lake Erie, the Colwell Lead Company, 63 Centre street, New York, lost 96,000 pounds of pig lead.

THOMAS F. ASHE has been appointed plumbing inspector at Knoxville, Tenn., and as the city has accepted some new sewers and notified the property owners to have connections made, the outlook for some activity among the local plumbers is bright.

THE FOLLOWING PLUMBERS have taken out licenses at Utica, N. Y.: George L. Brucker, J. F. & J. J. Cahill, William H. Kavanaugh, William H. Pryor, Edmund W. Stradling, Henry A. Welch, Edward Martin, Patrick J. Cahill, Charles A. Hurley, Wicks, Hughes & Griffiths, Charles J. Mahany, Dennis Nugent, Thomas Bear, Joseph Brought, Quinlan, Tuigg & Co., Joseph Morath, A. B. Johnson.

PRESIDENT ELIAL BERLA, Treasurer Joseph Smith and Secretary Alexander Don of Newark, N. J., Master Plumbers' Association, have just returned from a visit to the World's Fair.

EDWARD MOSS, 592 Third avenue, Brooklyn, N. Y., departs from the usual custom of window decoration followed by the average plumber in making an attractive display in his window of tacks, solders, traps, bibbs, water closets and basins. The plumber has as attractive material to make a fine window display as the hardwareman, yet too often the plumber's window presents anything but a pleasing appearance.

JOHN F. BRENEHAN has been appointed an Inspector of Plumbing at Fitchburg, Mass., his appointment to take effect November 1, at a salary of $900 a year.

IT IS REPORTED that the Huntington, Hopkins Company of San Francisco, Cal., are preparing to retire from business. Crane & Co. have taken their plumbers' supply trade in that city, and Miller, Sloss & Scott have purchased their stock of plumbers' supplies at the Sacramento branch.

THE PROVIDENCE, R. I., *Journal* gives a portrait of Reuben S. Bemis, the recently elected inspector of plumbing for the city. Flattering testimonials of Mr. Bemis' competency on sanitary matters were read previous to a vote by the joint convention of the aldermen and Common Council. As a reward for this service to the city they unanimously accepted an invitation to attend the Westminster Theater and see the fighting kangaroo.

A FIRE BROKE OUT unaccountably in the middle of the forenoon in the plumbing shop of E. J. Brady at 58 Warren street, New York. The principal damage done was to a large stock of gas stoves and other goods from the water used to stop the fire. The loss will approach $3000, and is fully insured. The fire department did not reach the building till 25 minutes after the alarm was struck, which accounts for the use of so much water. Mr. Brady's plumbers say they can run a water supply to a building in less time.

The Chicago Master Plumbers.

The Chicago Master Plumbers held a meeting at their rooms, 197 Madison street, Monday evening, October 23. The following master plumbers were elected members of the association: E. F. Shanahan, 4703 Indiana avenue; T. J. Sanford, 5238 State street; M. Dillingberg, 1511 Fifty-first street; Wm. Kirkwood, 662 East Sixty-third street; David Walsh, 6848 South Chicago avenue.

The Ladies' Auxiliary Society now has such a large membership that the meetings are to be held in the rooms of the Master Plumbers' Association instead of at private residences, as formerly.

THE LETTER BOX.

Philadelphia Mechanical Trade Schools.

From WM. A. H. ALLEN, *Superintendent of the Master Builders' Mechanical Trade Schools, Philadelphia.*—The fourth term commenced September 4, with very fair promise of exceeding the work of last year. As is usual, there are many pupils who find one term too short to furnish the knowledge they wish to obtain, and, as this becomes better known, it is gratifying to find that the recommendation of those who have attended the schools during the previous terms has often determined the application of their friends or relatives.

Recognizing the loss of allowing pupils to drift back into occupations unconnected with any trade, the committee uses its best endeavors to find places for the graduates in the trades of their choice, and has been able to provide for all the graduates, chiefly with members of the exchange. The third term was especially favored in that respect, and, with the reduction of the term of apprenticeship consequent on the obtaining of a certificate, several of the graduates of the first term are now receiving journeymen's wages. In fact, from the progress made by some of these young men, it would seem reasonable to discard any rigidly fixed term of apprenticeship, and when one can perform journeyman's work to allow him journeyman's pay.

There have been very many applications for trades, such as machine work, outside the list of those connected with building, but cramped quarters and the decision to confine instruction to trades represented in the exchange forbids their being placed on the list. To the first cause, and some technical questions yet unsettled with the trade, must be ascribed the failure to take up sheet metal work. It is not, however, absolute, though greatly to my regret.

The drawing which was added to the instruction in each trade has been of great benefit, and in most cases has excited great interest in the pupils. It is not, as you are aware, mechanical drawing in its generally accepted sense, but that which belongs to each trade. Few, if any, of the pupils intend to become draftsmen, but when one finds on inquiry how little a drawing represents to many workmen it can be easily understood that two drawing evenings per week could be fully occupied.

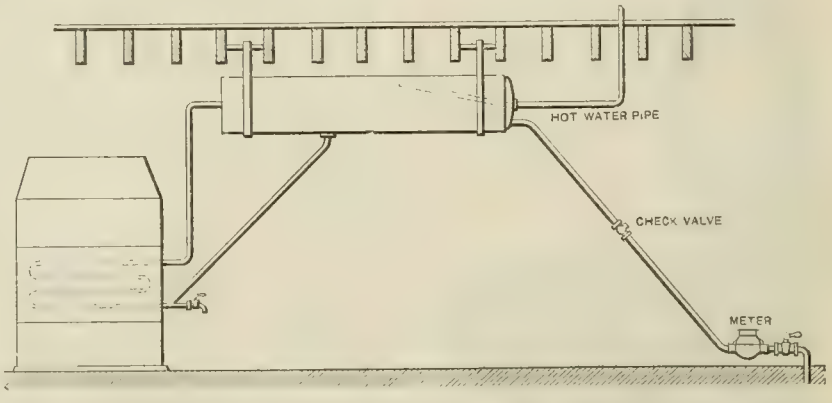
That many workmen recognize their deficiency in this respect is shown by the applications for instruction in drawing only, from journeymen as well as apprentices. So many have made such request as to warrant me in believing that if a school were established where what might be called trade drawing was taught, there would be no want of pupils. For the preparation for the profession of a draftsman involves more preliminary work than any of the mechanical trades, and workmen cannot afford either the time or the expense.

At the risk of making a communication more lengthy than valuable, I will add that our experience shows a defect in the public school education, in that the pupils have not been taught the practical application of their knowledge. All our pupils have had a knowledge of reading, writing and the ordinary rules of arithmetic, but very many, in the simple calculations necessary to their work, had no confidence in the use they could make of it. And they are not alone in this respect, for men who unwisely left school too early have wished for instruction in the same line; and if the objects of the schools were not the instruction of apprentices it might be a matter of regret that they could not be accommodated.

No day classes are at present in contemplation, but if the progress toward an endowment fund warrants removal to new quarters, there will be an opportunity of extending the sphere of usefulness and of taking up trades which present circumstances do not allow.

Keeping Hot Water Out of Meters.

From J. O. G., *Battle Creek, Mich.*—Will *The Metal Worker* please advise me of the different methods now in use to prevent hot water from range boilers getting back into meters by expansion or by syphonage? I am quite familiar with putting a hole in the conducting tube, but that will not always overcome the difficulty. Suppose the boiler be suspended from the cellar joists and connected with a coil in a furnace, as shown in the illustration. The regulations here require that a check valve shall be placed between the meter and the boiler, which I consider a dangerous practice, and as yet have never done it, as there would be no chance for expansion. Am I right? The meters here are easily spoiled by hot water, as the pistons are made of hard rubber.



Keeping Hot Water Out of Meter.

Note.—It is probable that some of our readers can offer suggestions to this correspondent. Some put a small notch or hole in the check valve to provide for the expansion, depending on the cool pipe and water to overcome the heating effect of the small quantity of water that passes through. It is probable that a safety valve, located so the overflow would be caught in some fixture, would answer every purpose.

Grate, Boiler and Radiator Surface.

From C. S. H., *Marblehead, Mass.*—Will you kindly give in *The Metal Worker* the rule for apportioning the grate surface to the boiler surface and the boiler surface to radiating surface per square foot on an average for both steam and hot water apparatus?

Note.—The variety of constructions used will make any approximation seem wide of the mark when applied to some particular case. The following, however, which is a rather conservative estimate, may prove satisfactory to our correspondent:

	Grate surface. Sq. feet.	Boiler surface. Sq. feet.	Radiator surface. Sq. feet.
Hot water	1	15 to 20	.....
Hot water	..	1	8 to 12
Steam	1	25 to 30	.....
Steam	..	1	4 to 6

Steam Boiler Too Small.

From P., *New Jersey.*—I have a steam job to overhaul where the boiler is too small and it is not practicable to change it. Will *The Metal Worker* please tell me if it will help matters any by putting in larger radiators? If so, why?

Note.—As a building is heated by the amount of radiating surface that is kept well heated by a liberal supply of steam from an ample boiler, there seems little probability of increased radiating surface proving a remedy for lack of capacity in the boiler. Cutting off one or two rooms from the present boiler and heating them by some other means will doubtless prove more satisfactory.

A Heating System.

From R. A. C., *Philadelphia.*—I think "G. P.'s" heating system for a school, in *The Metal Worker*, October 14, is open to some improvement. His first mistake is making the pipe in the ventilating flue so large, as it should not be over 8 inches; and it ought to be of cast iron, for terra cotta will crack from heat. A large amount of warm air is wanted for the classrooms and a sepa-

rate flue should be provided for each room. In a building where the janitor is not always present the fire is apt to be neglected and the rooms cool off while the school is in session. If the registers on both floors are left open at one time all of the heat will go to the upper floor and the first floor would be cold. I would suggest that two registers be put in the same flue in each room, one register to be 4 inches and the other 7 feet above the floor. There should be two ventilators in each room, one 4 inches above the floor and the other 2 feet below the ceiling, with self indicating cards.

A Smoking Stove.

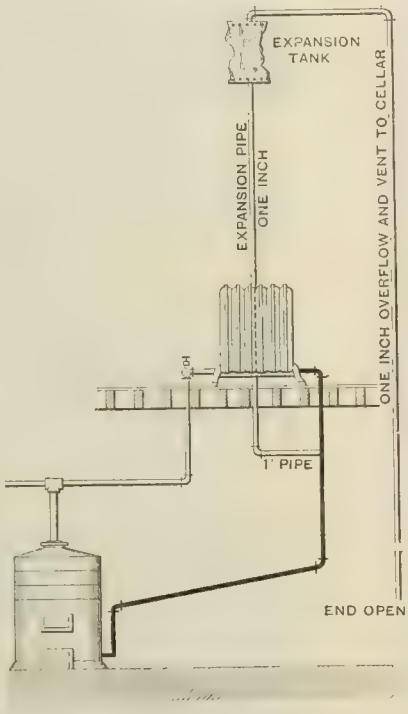
From J. C. K., *Charlottesville, Va.*—I wish to know the cause of a smoking stove and apply to *The Metal Worker* for help. The stove is on the Franklin order, made to go in a fire place and heat an upper room. I was told that the chimney smoked badly and was ordered to make a chimney top. I found the chimney to be 23 x 40 inches, containing three flues each 8 x 15 inches. A top was made after the method of "I. T." in *The Metal Worker* of May 13, which is very good. I made the top 2 feet 6 inches high, tapering it to 10 inches, running it up 2 feet higher and putting on it a swivel top. The stove still smoked and smoke came out of the fire places in rooms connected with the other flues, the smoke coming up one flue and down the others.

I then put 7-inch pipes in the chimney top, directly over the other flues, but that did not work. I then made two short tapering pipes to fit the flues and connect with the 7-inch pipes in the chimney top; this stopped the side flues from smoking, but the stove continued to smoke. I then took off my chimney top and ran a 6-inch pipe from the top of the chimney down to the flue stopper and connected it with the stove pipe, making one continuous pipe from the stove. But the stove still smoked even with a little fire. The stove has been up three years, but has just commenced to smoke. The pipes to the stove have not been altered in the least and the stove seems perfect. There are no trees near that would cause trouble. I have explained this case to our stove men, but they cannot suggest a remedy. The chimney runs up some distance above the roof and is in good order This is the first stove that has got the best of me in 25 years, and I hope some of the readers of *The Metal Worker* will give me some help, which will be thankfully received.

Note.—This appeal to our readers will no doubt bring aid. The fact that the stove has worked two years encourages the belief that it can be made to work again when the conditions are exactly the same. The changed condition is the thing to find. It may be an accumulation of soot, dust or ashes in one of the flues of the stove, or the stove may have a hole rusted through it somewhere which partially kills the draft, or the pipe connection may have been broken at some place. The stove may have cracked or a nut come off of a bolt, letting the plates apart, or the cement may have been destroyed, and there is now an opportunity for a free entrance of air where there never was before, which would make the stove smoke. We would suggest that the stove be taken where it can be thoroughly cleaned, examined and cemented, and if any plate or part needs renewing or readjusting it can be readily seen and fixed. If this is done and the stove again set up with care to make the pipe connections tight we think it will work. It is doubtless something so simple as to escape notice that has baffled the skill of our correspondent. The top of the chimney is less often to blame for the troubles with a chimney than is imagined, and where a stove has once worked without a top on the chimney it can be made to work again.

Collapsed Expansion Tank.

From P. M., *New Milford, Conn.*—Please inform me through *The Metal Worker* what caused the expansion



Collapsed Expansion Tank.

tank shown in the illustration to collapse. It has no vent, except through the overflow pipe, which has an open end in the cellar.

Note.—Without some stoppage in the overflow pipe which prevented the entrance of air and so permitted a vacuum, it is difficult to account for the collapse. If steam formed and caused the system to overflow the expansion tank the water running down the overflow pipe would not only stop it, but by dropping down would tend to create a vacuum at the same time that the steam would condense and the water in the system would drop to its level to increase the vacuum. If the end of the overflow is connected with the cellar drain, and from any cause water rose so as to close it, air could not enter to relieve any tendency toward a vacuum. The collapse can be prevented in future by running an air pipe up a few inches from the top of the horizontal part of the overflow pipe. In the case of an overflow water would run along the horizontal pipe without rising in the air pipe, and as soon as the water passed air could enter readily to prevent the formation of a vacuum. If any fear of overflow in the air pipe is entertained a swinging check valve placed in it will prevent it.

Spinning Aluminum.

From G. M., *Camden, N. J.*—Will *The Metal Worker* please inform me if an article the size of an ordinary thimble can be spun from aluminum and how it is done?

Answer.—An eminent authority on aluminum, J. W. Richards, says aluminum can be spun on a lathe into all sorts of round and hollow forms; it may also be pressed or stamped into shape in the cold; it is of advantage in doing this to use a kind of a varnish composed of 4 parts oil of turpentine and 1 part stearic acid. Soap water is always to be avoided. The best means of burnishing is to use a piece of soft wood soaked in olive oil; this closes the grain and gives a brilliant finish.

Laying Water Pipe.

From E. A. W., *Vermont.*—Please inform me which arrangement of piping will discharge the most water, the fall being 190 feet from a spring, and the distance traveled 150 rods. Would it be better to have the first half of 3-inch and the last half of 2-inch pipe, or to reverse it and have the smaller pipe near the spring? Or would a still better arrangement be to have both ends of 3-inch and the middle 75 rods of 2-inch pipe?

Note.—We judge from our correspondent's letter that he has 75 rods of 3 inch and 2 inch pipe which he wishes to utilize in carrying water from a spring. Under the circumstances, he would do well to run the first 75 rods from the spring of 3-inch pipe and continue it to the outlet with 2-inch pipe. Generally speaking, however, it is the diameter of the 2 inch pipe that will determine the flow, and there would be no very great difference in the results obtained by laying the pipe in the two ways mentioned.

Two Styles of Air Ducts.

From R. A. C., *Philadelphia.*—As occasionally we all get a customer like the one reported by "J. H. T." in *The Metal Worker* of October 14, a helping hand must be lent, though too much space should not be wasted on them. I would say in reference to cold air ducts that there are in the Philadelphia schools no less than 1000 ducts built as shown in Fig. 2 in his letter, with a damper in them, and that they continue to be built.

Determining Water Pressure.

From H. E. M., *Brooklyn, N. Y.*—Please publish a simple method for computing the pressure of water from pipes at different elevations.

Answer.—For the pressure of water in pounds per square inch multiply the depth in feet by 0.434.

STEAM AND HOT WATER.

Run the Pipes Carefully.

The following, from the London *Plumber and Decorator*, should impress the fitter that a spirit level is as essential and indispensable for the correct running of pipes as his wrenches, and that it can be more generally used with great advantage for detecting the cause of unsatisfactory service:

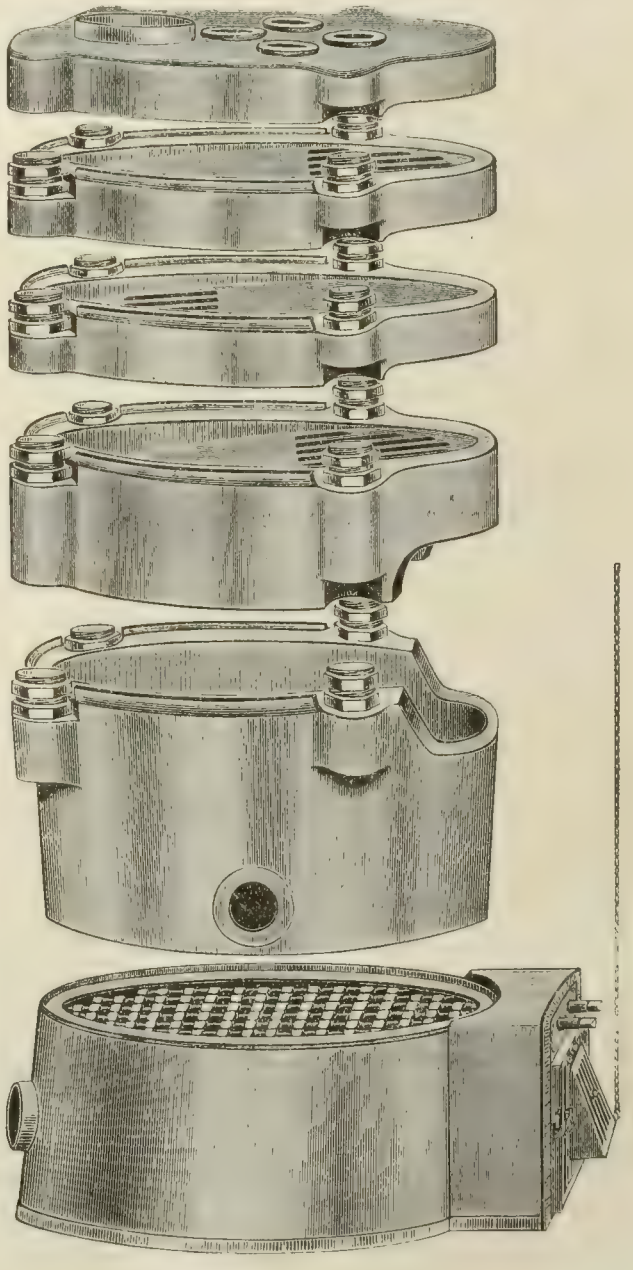
That there is a wide difference in the effectiveness both of hot water heating and steam heating apparatus is a fact known to all well informed men engaged in the heating trade, but in many instances this difference is accounted for by referring it to anything but the proper cause—namely, defects in the system of piping between the steam boiler or water heater and the radiators. The boiler may be good, the radiators may be the best in the market, yet the result is unsatisfactory. In most such cases it will be found that not enough study and care have been given to arrangement of pipes and radiator connections, to their proper sizes with reference to the surface they are to supply, to their pitch, to the supply in steam heating pipes of proper relief pipes, to avoidance of traps in pipes, to provisions for expansion under the action of heat, and so on to the end of the chapter.

These remarks apply to both large and small installments. Some of these defects are not always chargeable to the contractor who puts in the apparatus. Many buildings, large and small, can be found wherein, when first erected, the heating apparatus worked excellently, but in a year or two began to snap and pound vigorously, while its lack of vigor in heating some parts of the building became uncomfortably apparent to complaining occupants. What has happened during the interval between satisfactory testing and the failure to heat successfully is that the building has settled unequally, thus neutralizing, and in many cases often reversing, the inclination given by the fitter to the pipes and canting radiators so that their outflow connections are higher than their inlets. Examine the boiler; you will find nothing there to prevent efficiency. Radiators and valves, water feeding and draft regulating appliances may be all in first rate working order. The fault is that the piping has been disarranged because the building has settled, and settled unequally. The "skin builder," not the fitter, is to be blamed in such a case.

Improved Palace King Hot Water Boiler.

Russell Wheeler & Son, Utica, N. Y., are now placing on the market their Improved Palace King hot water boiler, the accompanying illustrations of which show the chief features of its construction. They write us that the success of their boiler in the past four years has proven the practical value of the inclined waterways and horizontal boiler surface, which are features of their construction, and that these points are all retained in the Improved Palace King.

The new construction has a wrought iron nipple connection with running thread, and this nipple is so set in the boiler that the use of it allows the retaining of the proper proportions of the boiler. Fig. 1 shows the boiler with sections suspended over each other, and nipples set in each bottom section ready to be backed out and to engage the water post of each upper section. The upper lock nut of the nipple is pinned firmly on to the nipple and acts as a shoulder for the wrench to engage, and also as a lock nut. The lower lock nut runs on the nipple, and is an assurance of safety if the thread on boiler or nipple should be damaged any way in shipment. By staggering the pockets in which the nipples set, the manufacturers claim to have attained a perfectly proportiond boiler, in which the sections lay close together and in which the flue spaces between boiler sections are not excessive. Again, the manufacturers state that, owing to the inclining of the waterways from rear to front in each section, it is impossible for a water or air trap to form in the Palace King, as the water when being drawn out of the boiler will drain down through the rear water posts, and upon filling up the air will pass up through front water posts. Fig. 1 also shows their new triangular shaking and rocking grate. This grate is so arranged that one or more grate bars can be removed at will without disturbing the rest of the grate, and they state that a boy can in a few minutes renew any grate bar, if it is so desired. The ash pit is large and roomy,



Improved Palace King Hot Water Boiler.—Fig. 1.—Boiler with Sections Separated.

having lift door and chain attachment, and each pit is provided with a collar on the rear for use as dust flue.

Fig. 2 shows a transparent cross section of the Palace King boiler and gives an excellent idea of the circulation of the heated water. The manufacturers claim that the inclining of the sections greatly decreases the friction in water travel, and that it is a recognized fact that water when heated circulates much more quickly and with less friction in a vertical column than in a horizontal section, but it is also a fact that vertical boiler surface is greatly inferior to horizontal boiler surface as an absorber of heat, and that 1 square foot of the latter is as effectual as 2½ square feet of the former. Russell Wheeler & Son therefore claim that in the construction

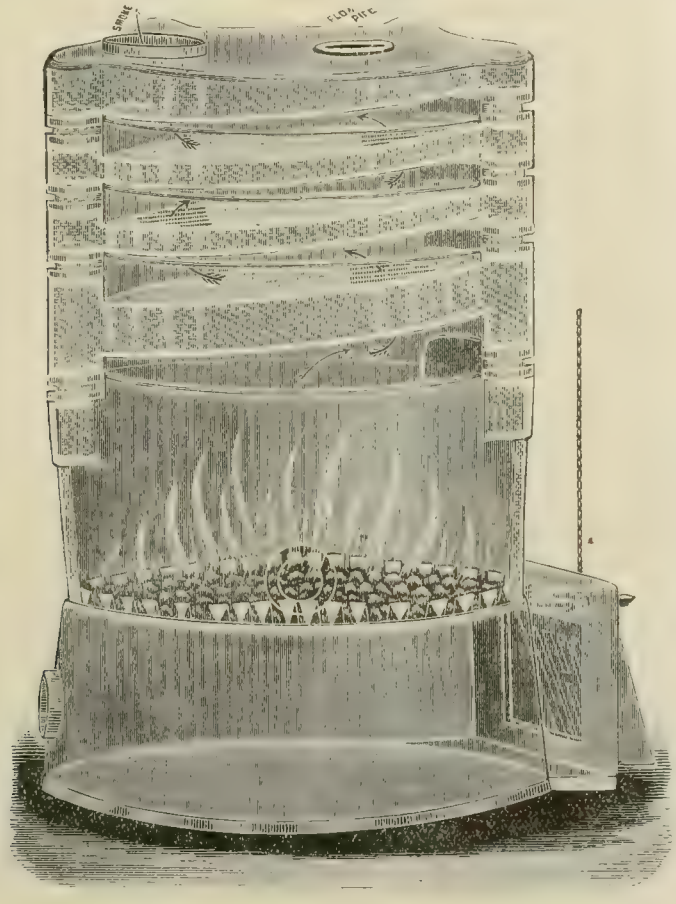


Fig. 2.—Vertical Section through Boiler.

of the Improved Palace King boiler, they have embodied two vital principles, viz.: Vertical circulation and horizontal boiler surface. The inclining of the waterways renders steam space forming and water lifting out of any of the sections impossible, and very rapid, positive upward circulation is attained under any pressure. By their construction the products of combustion are compelled to pass four times across the boiler before they will reach the smoke pipe collar. The manufacturers desire to call attention to the simple manner in which the boiler can be cleaned, large doors being placed on each section so that every part of the boiler can be reached with the hoe and steel flue brush provided for cleaning.

JOHN A. SCOLLAY, 72 and 74 Myrtle avenue, Brooklyn, N. Y., has recently received in one consignment 39 hot water boilers from the foundry of John Davies, the opening up of the heating season having exhausted Mr. Scollay's stock on hand.

A Steam Heating Episode.

BY L. M. W.

Stopping at a hotel not long ago in which the recently installed steam heating plant was a noticeable feature, an unusual entertainment was afforded. Supper had been enjoyed in company with a well preserved old gentleman of the old school, and later in the evening we went upstairs together. On retiring the rooms were found agreeably warm, though there was snow on the ground and the weather cold. This was due to heating coils arranged all along the halls, which suggested traps by an occasional rattle. The length of my nap previous to its being broken is of no consequence compared with what followed. I heard a severe thumping on the headboard in the adjoining room, and at the same time a hammering in the coils that would have rivaled the noise of a dozen tinners, all making stove pipe.

Above all rose the voice of my old friend, who was not so profane as he was prolific of promiscuous epithets. "Go away from there, you man mule! Why don't you do your blacksmithing in the daytime."

All was quiet for a few minutes, as if the order was obeyed, when a more elaborate racket started. He immediately shouted, "You think it is fun, you night buzzard, but I'll show you different." Another cessation of a few minutes enabled me to realize that my old friend imagined that some one was creating the disturbance, and I laughed outright as the music again began. "You laughing hyena, I'll make you yell like a pack of jackals if you'll stay there long enough." A voice from across the hall inquired, "What's the matter, grandad?" Then the old man delivered himself extemporaneously in a manner creditable to his blue stocking education, and jumped out of bed full of fight, when all became quiet again.

When the next racket started his door flew open with a bang, and a soap cup sped down the hall in the direction of the noise, accompanied by the remark, "You miserable midnight maggot, I'd like to bang your brains out." The soap cup struck a baluster and dropped down stairs with a crash that scattered its pieces. It brought the night clerk up just as a terrific hammering started behind the old man. This time he yelled, "You offspring of a swill pail, your dirty sides ought to be staved in! Are you an idiot that you rob the night of its quiet? Begone with you!"

The clerk grasped the situation at once and came up laughing to explain, but before he had a chance the old gentleman assumed that he was the culprit. He called him "a dirty ditch water tadpole, a mean skunk, a rotten squash," and flooded him with titles representing equally choice specimens of animal and vegetable life till his breath gave out, and the hammering started in fine style on both sides of the hall.

Then the clerk explained that it had got colder outside and the fire had got down, which made the steam condense, and when the water was not drawn off from the coils such a noise often resulted. For the balance of the night he promised to keep the coils clear and stop the noise. The old man remarked as he went into his room that he knew steam was powerful, and had just learned that it could be a powerful nuisance, as he gave his door a powerful slam. A cheer went up for the old man and the steam heater from several rooms, and the coils joined in with a final rattle, bang and hiss, and as the condensed water had escaped a permanent quiet followed.

Cement for Steam Fitters and Plumbers.

The German technical papers are remarkable for the practical receipts which they contain; not that our own journals do not contain practical receipts, but because those in the German papers, instead of being copied from ancient receipt books or concocted at random, usually bear the name of some well-known scientific man, and are based on reasoning as well as experience. One of these receipts, by Herr K. Keyfar, is copied in the *Bautechnische Zeitschrift*, and is worth remembering by steam fitters and plumbers. As is well known, the cement used for making tight the joints of steam pipes and other iron work exposed to heat and pressure is a pinkish putty, now commonly made with a mixture of white and red lead, although it is not long since pure red lead was supposed to be the only proper material. This lead putty is, however, according to Herr Keyfar, often carelessly and ignorantly made, so that it fails, sometimes to a dangerous extent, to do what is required of it. Properly, the cement for putting together steam pipes should be made with equal parts of pure red and white lead, thoroughly mixed and well kneaded with pure linseed oil which has been rendered drying by boiling with 10 per cent. of red lead. Workmen in steam fitting shops do not know much about the properties of oils, and often mix their putty with raw linseed oil or grease, or even kerosene. It is hardly necessary to say that coal oil is soon volatilized by the heat, leaving

the white and red lead in the form of powder. Grease is not much better, and raw linseed oil hardens slowly, and should not be employed. Where the materials are suitable the putty sets quickly, and becomes so hard that it can with difficulty be cut with a chisel. The mixture of red and white lead has certain advantages over either separately, which should be understood. Red lead alone gives a hard and quick setting cement, but the red lead putty is not very plastic, and does not cling well to the surfaces of the iron. White lead alone makes a plastic and adherent putty, but while red lead gives up a part of its oxygen to the oil, so that a red lead putty hardens all through, white lead does not yield oxygen, and a mass of white lead putty hardens only on the surface, remaining for a long time soft in the interior. A mixture of the two substances combines the advantages of both. In kneading the putty, care should be taken not to allow iron filings or bits of dust to get into it. Where the joint is not to be exposed to heat chalk may be added to the putty in quantities equal to that of the white lead. If the drying must be hastened, a little brown oxide of manganese, very finely ground, will help it. For hot joints, finely ground graphite, in quantity equal to the white lead, may be added, but the graphite cement does not set so quickly as the lead alone. The surfaces to be joined should be even, as left by the turning lathe or planer, but the putty will not stick well to a polished surface. Where the putty alone must support a severe pressure, as in the case of a flange joint in a steam pipe, it is best to strengthen it by inserting in the joint a piece of paper or felt, covered with putty on both sides, and if the joints are very rough, as in the case of flanges which have not been turned or planed, it may be best to mix some threads of hemp or flax with the putty, but care should be taken not to use too much. Where the joint is exposed to great heat no combustible substance, such as flax or hemp, is suitable, and the best way is to cut out a piece of wire gauze, spread it thickly over with putty, and lay in the joint. It is sometimes necessary to make steam tight joints in such a manner that they can be readily taken apart and replaced, as in the case of the man hole of a boiler, or the head of a cylinder. For making these joints the lead putty is unsuitable, as it becomes too hard to be easily removed, and it is best to employ felt or soft paper soaked with boiled linseed oil. If possible, sheets of such paper should be previously prepared by soaking with the oil and drying, and, when used, they should be cut to the proper shape, covered on both sides with boiled oil and laid in the joint.

HEATING NOTES.

H. GILBERT HART of Hart & Crouse, Utica, N. Y., has been making a few days stay in New York, the guest of W. M. Mackay, the manager of their steam and hot water department, at 236 Water street.

W. H. HARRIS of the Standard Radiator Company of Buffalo, N. Y., is spending a few days in New York, the guest of the American Radiator Company, at 94 Centre street.

C. S. GRAVES, the New York representative of the Model Heating Company, is showing at 305 Pearl street a No. 28 Novelty circulator for hot water heating. This is something new, having a square base, a rocking grate, a new front, rendering the flues more readily cleaned and some internal improvements that are said to greatly increase its efficiency.

SCRAP.

THE SHEET MILLS of the Laufman Tin Plate Company, Butler Junction, Pa., are running full time, but in the tinning department only half the usual number of men are employed owing to a falling off in orders for tin plates consequent on the financial depression and uncertainty. P. H. Laufman, the head of the concern, is reported as saying that jobbers who formerly ordered carloads are now buying small lots, or just enough to supply their immediate calls. He attributes the dullness largely to uncertainty in regard to the tariff.

THE EXPORTS of tin plates and sheets from Great Britain to the United States during the month of September show a further falling off in volume. British Board of Trade returns for the month give the amount as 13,789 tons, against 15,000 tons for August and 22,535 tons for the month of September, 1892. The respective values were: September, 1892, $1,429,080; September, 1893, $861,432. Total shipments to the United States for the first nine months of this year were 212,241 tons, as compared with 214,527 tons for the same period of 1892.

TEST OPERATIONS were carried out last week at the new plant of the New Castle Steel & Tin Plate Company, New Castle, Pa. The black plates made gave complete satisfaction, and were pronounced by experts equal in finish to any of foreign make. The tinning department will start up almost immediately.

THE WORKS of the United States Iron & Tin Plate Mfg. Company, at Demmler, Pa., manufacturers of tin and terne plate, are in full operation, the firm having a very active demand for their various brands of plate. A fact generally known to the trade, but which is worthy of mention here, is that to this concern belongs the distinctive title of being classed as the pioneer manufacturers of tin plate in this country. Away back in 1873 this firm engaged in the manufacture of tin and terne plate at their present location, but of course their plant was considerably smaller at that time than it is to-day. When the change was made in the tariff by which the duty on tin plate was considerably lowered they were compelled to abandon its manufacture and confine themselves exclusively to the production of iron and steel sheets, dripping and bread pans and other goods of a similar nature. The restoration of the duty on tin plate by the passage of the McKinley bill resulted in their spending over $100,000 in the remodeling and enlarging of their plant in order to engage again in the industry. The facilities possessed by this firm for the manufacture of tin and terne plate are second to none in the country, and are testified to by the fact that during the worst period of the business depression their tinning department was kept in constant operation, and nearly all the time to full capacity. Much of the success of this concern is due to the able efforts of W. C. Cronemeyer, chairman, who has labored unceasingly in the interests of the industry. This firm have for free distribution a pamphlet giving valuable information to users of tin plate, which will be forwarded to any address upon application.

A RECENT VISIT to the new plant of the New Castle Steel & Tin Plate Company, at New Castle, Pa., developed the fact that this concern have one of the most complete plants in every respect in the country for the manufacture of tin and terne plate. The buildings are all of iron and as nearly fire proof as could be made. The welfare of the employees was carefully looked after in the construction of the buildings, and they are so arranged that a very comfortable temperature can be maintained during the summer and winter months. The entire equipment is of the most modern design throughout, and will permit of the handling of both raw and finished material to the best possible advantage. The location of the plant is an admirable one, the concern having switch connections with three different lines of railroads. The plant of the Shenango Valley Steel Company lies just alongside, and this will enable the firm to purchase their billets at the very lowest market prices and at the same time insure a material saving in freight charges. As yet only black sheets for tinning purposes have been turned out, but in a short time the tinning department will be put in operation. It is the intention of the firm to make a full line of the different grades of tin and terne plate, and they will also be sellers of black sheets in the open market.

A BALTIMORE, MD., DISPATCH of October 26 announces that the Locust Point Iron & Steel Works Company of that city have passed into the hands of receivers. The appointment of receivers was made on the petition of the E. J. Codd Company and George W. P. Coates, the latter a stockholder in the concern, and he, together with Frank Ehlen, are the receivers. The company manufacture iron and steel sheets, and have for the past 18 months been extensively engaged in the production of tin plates, which, the directors state, has been a profitable branch of their business. The prevailing monetary stringency and uncertainty in regard to tariff legislation are given as the reasons for the firm's troubles. The capital of the company is $100,000, and the liabilities are said to be small. The works will probably be kept in operation.

A PRESS DISPATCH from Washington on Thursday says that the first draft of the tariff bill has been completed. There are various rumors as to the proposed changes in the metal schedule, one of them being to the effect that the duty on tin plate will be reduced to $1\frac{1}{10}$ cents. per pound.

A New Jersey photographer has devised a simple method of photographing a person in five different positions at once—that is to say, he obtains a picture which gives five views of the sitter in as many attitudes. This is accomplished by using as a background two plane mirrors, forming between them an angle of 45°, and placing the person at the junction. The usefulness of the device will be especially found in criminology.

The *Railway Age* mentions that recently two steamers carried away, within 24 hours, as much freight from Chicago as all the railway lines leading to the East in that time, notwithstanding that the latter have cut down their rates to the closest of margins.

The Center Blast Tuyere Cupola.*

BY THOMAS D. WEST, SHARPSVILLE, PA.

The economy that is possible if two or more rows of tuyeres could only be made to force the blast to the center of the cupola and at the right elevation, caused me two or three years ago to give thought to the subject and to desire to get nearer the theoretical figure than present cupolas were doing if it could be possible.

One plan after another suggested itself until the idea of a center blast came to me. Having two cupolas in our shop, I thought I would experiment with the smaller, which is 40 inches inside diameter.

The experiment in this small cupola resulted so favorably that we concluded to try the plan in our large cupola in connection with the outside tuyeres, which we did after the plan illustrated by the cut herein shown. Before starting in to use this bottom center blast tuyere, we were not safe in trying to do better than one to seven or eight in fuel, as our metal came all from pig iron and had to "come down hot." With the combination of the center blast and outside tuyeres we found we could obtain hot metal with one to ten or eleven, and I would state that the one to ten and eleven iron was often much hotter than the one to seven or eight melted with the old process, and it would often come so hot it would take considerable scrap to cool it off before it would be wise to pour the metal. To say it would be as hot as stove molders would often care to use it would probably be the best way to convey an idea of its heat, and it might be well to state that the metal would be hotter at the end than at the beginning of the heat. The cupola men liked to use the device, as it made the work of chipping out and daubing up the cupola so much easier than in the old system, for in fact there would often be very little of such work to do. In my experimenting there were several plans tried, but the one recommended later on is the best and last one I am using with this system. It cannot but be evident that with such a plan the blast is conveyed to the center of the cupola or body of fuel, where it should be to achieve the greatest results, and if the theoretical point in perfect combustion is ever to be reached it will be by some such system. Not only does this plan save fuel, but also the lining of cupolas, while the present methods or principles now used for accomplishing economy in fuel do so at a sacrifice to the lining; so much as to make it in many cases a question if there is any economy in using "upper tuyeres."

A is an outside tuyere box made of ¼-inch wrought boiler plate, so as to make it light for dropping purpose. It is bolted only to one half or section of the "drop doors." C is a hinged cover having a hole for the bar cap supporter D. At E is a one and one quarter hole stopped by a little pivot swinging valve, so that if through the peep hole B any leakage should be seen, this valve could be swung back to let the metal or refuse run out. It will be noticed that the tuyere box A is made of a taper, so that should slag iron or refuse drop down into it, it could be readily relieved. The cylinder at F is made of an inner and outer ring of ¼ inch boiler plate. The space G is filled with fire clay. H shows angle iron, of which there are four pieces, for the purpose of supporting the round iron rings I. These and the angle irons are for holding and preventing the bagging of the fire clay, which is daubed on over them to protect the cylinder F from the melting heat of the cupola. This clay would be put on after the cylinder is placed in position inside of the cupola, and dried by the burning up of the bed. It would be the better plan to have two cylinders, so as to have one all the time on hand for drying in an oven. One heat gave us trouble through lack of care when half through by the metal getting through the clay to the iron rings. K is a clay cap having a cast iron prickered casting, as shown at M. The clay or ganister used for forming this cap K and daubing over the cylinder F should be of the best quality. The 1½-inch bar shown at D is in two sections, so as to enable its being pulled out before "dropping the bottom."

In cases where cupolas stand high the bar might often be worked in one piece, In placing the cap K on the cylinder my first plan was to let it rest down upon it and then after the blast was on and the iron commenced to melt the jack screw R would be raised, thereby lifting, of course, the bar H and the cap K to make any width of opening at S for the admittance of the blast that would be thought wise. The raising of this cap up against the pressure of coke and iron gave us trouble at one heat through breaking off of the clay at the outer rim of the cap, so that after the cast was about two thirds over the heat in the cupola had melted the casting M so as to cause a leakage down into the tuyere. We then tried another plan by letting the cap rest on three pieces of fire brick, one of which is seen at X, as done in the 40-inch cupola; these being equally divided, the blast would have ample room to find space for entrance between the top of the cylinder F and the cap K, as at S. In order to prevent the blast from entering this tuyere ere the iron commenced melting we used a damper, as seen at Fig. 2, which would be placed up in the cylinder F at a point about level with H and which consisted of a jointed bar the same as seen at D, having at its end a round piece of ¼-inch boiler plate, as at O, having prickers riveted into it for the purpose of holding clay to keep the damper from getting hot and also bring the clay down when the damper would be removed or the blast allowed to enter the cupola. This arrangement, of course, did not require any jack screwing. We simply had the bar D protrude below the tuyere box cover G about 2 inches, so that a swinging catch attached to this cover supported the rod D, and in removing this damper we simply knocked the catch away and the damper fell down, bringing its clay with it. Of course, with this arrangement of damper, the center supports or guides P P for the bar D, when the raising plan was used, were removed. This plan was a decided improvement over raising the cap and worked all right. The reason for it not being desirable to admit the blast through the center tuyere ere the iron commenced to melt was, in the first place, to have the bottom outside tuyeres get the carbonic acid gas well started from the lower fuel before admitting oxygen to combine with the carbon oxide created in the fuel above the bottom tuyeres, upon the same principle that it is desirable to do so with upper outside tuyeres. In the second place, it greatly aids in preventing the tuyere hanging up when the bottom is dropped, with very large heats.

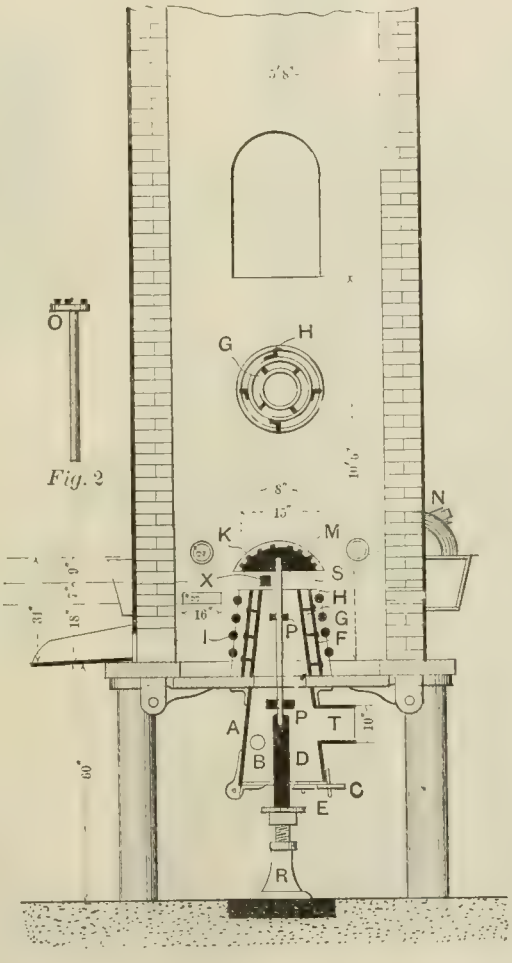


Fig. 2

THE WEST CENTER BLAST TUYERE.

The cap K, as shown, was made larger in diameter than the cylinder F, so as to prevent the dropping metal from falling or getting into the opening at S during the heat. It will be noticed that the point of entrance for blast at S is higher than the bottom outside tuyeres. This is done to achieve the end accomplished by upper outside tuyeres in admitting oxygen to combine with the carbonic oxide in turning it to carbonic acid gas, thereby making more complete combustion.

In making connections for the blast with the center tuyere box A, conditions will vary the plan to be adopted.

*From a paper read at the meeting, October 18, of the Western Foundrymen's Association.

The attachable pipe coming to this tuyere and connected at T should be an independent one coming directly from the main blast pipe, and not from any of the side tuyeres or wind boxes, and a damper should be arranged in this main side branch pipe so that the pressure of the center blast can be regulated independent of the outside blast. The cupola shown has 12 outside tuyeres, six of them being lower tuyeres 3 x 16 inches, and six of them upper tuyeres 2 inches in diameter. The width of opening for the center blast admitting of air was about 2½ inches. In "dropping the bottom" after very heavy heats we sometimes found that the center tuyere would hang up, but by a little rapping on its protruding end with bars it would come down, and leave a good "dump" or "bottom dropped cupola." In using this tuyere by itself or in combination with outside tuyeres it is essential in large heats to flux a cupola well and run the slag off. By letting slag remain in the cupola it readily chills around the tuyeres and thereby causes "bunging" or "hanging up," and it might be well also to state that the outside tuyeres should be kept well open so that the blast can find easy delivery to the end of the heat through them. At the start the blast should not pass through the center tuyere with any more force than necessary to counterbalance the inside wind pressure. The blast is delivered from a No. 9 Sturtevant fan.

If this system should be adopted in cupolas that are to run steady over ten hours, like those at steel works, I would like to hear of some one trying the cylinder F (instead of as here shown), having it constructed of all fire brick, every other course being tied with a thin plate of boiler or cast iron, the edges of which standing back, so as to be protected by a covering of clay. These rings should not be over ⅝ inch thickness. The idea is to make sure of the heat not causing any cracks to occur in the brick tuyere or burn the edges of the rings while the blast is on. By well tying the brick work or "breaking its courses" it might stand well without the use of the iron rings. I have tried an all fire clay cylinder tile baked in a fire brick kiln, but it did not prove a success, as it was cracked and gave us trouble from leakage. For ordinary cupola work, I know that with care and judgment the plan here illustrated, and having two cylinders as above suggested, could be made to work successfully, and all who try it will find they can save fuel and the cutting of their lining. The latter with some firms is a very costly affair. Of course, in starting in to try this system one is not expected at the very first heat to charge with a radical change in using less fuel, but gradually trying less every heat until they find by trial just how low they can get. At the start you can at least depend on reducing the bed in bulk whatever the bulk of your center tuyere may occupy, and between charges have 20 per cent. less fuel. I know that in our 68-inch cupola we reduced the bed after trials from 3000 to 2100 pounds, and in charges from 900 down to 500. The iron we place on the bed is 8000 pounds, and between charges 6000 pounds, and, as stated in first part of paper, our heats run from 50 to 70 tons. We are still experimenting in this line, but as business has been so dull for the last three months, there has been but little opportunity to go ahead and compute the results.

A remarkable coincidence in this experimenting is that after I had been laboring with the new system, thinking the idea was alone with myself, a letter came from the far North showing that another foundryman was likewise experimenting—Thomas H. Widdowson of Mankato, Minn., who wrote me on this subject after I had been at work upward of a year.

In the discussion Mr. Widdowson stated that in his experiments the melting was faster and hotter. Mr. West made the point that the use of the center tuyere allows of using a lighter blast, and added the following detail to those contained in the paper: "The cupola I used for my experiments was 44 inches in diameter and I put in upper tuyers, about four of them, about 10 inches above the lower tuyeres. I found in experimenting that when the blast was cut off you could hardly get near the charging door. The men in charging would throw their iron in and jump back. We opened the upper tuyeres and the flame would die down." Mr. Widdowson and Mr. Moore agreed that founders usually use too much blast.

The Morse Valve Reseating Machine.

The Leavitt Machine Company of Orange, Mass., make the valve reseating outfit shown in Fig. 1, which is used to reseat all flat and taper seated valves from 4 to 9 inches, while that shown in Fig. 2 takes the range of 9 to 12 inches. The

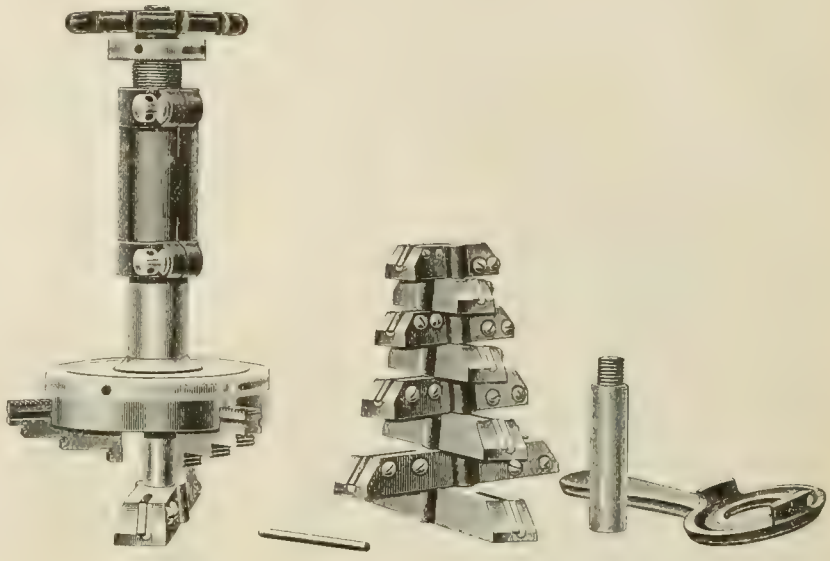


Fig. 1.

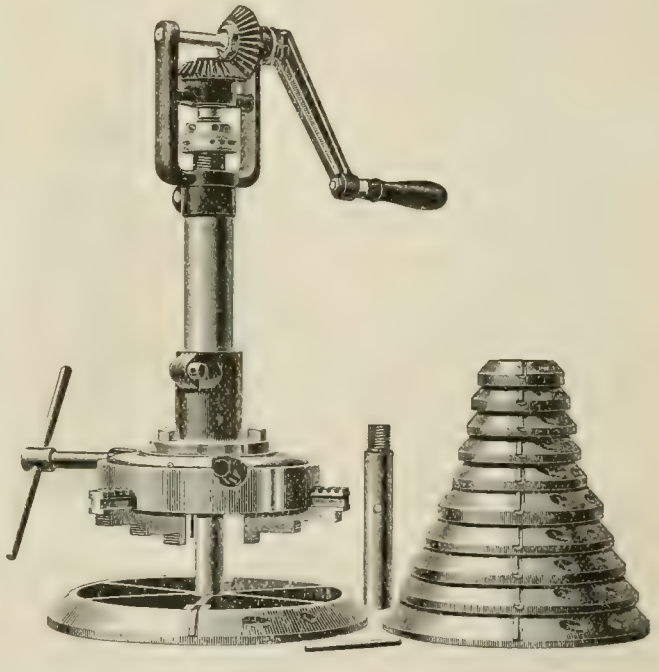


Fig. 2.

THE MORSE VALVE RESEATING MACHINE.

lower portion of the machine is provided with a chuck arranged to grip in the opening in the body of the valve and thus hold the device firmly in position. The lower end of the spindle carries the cutter, which is fed to the work by means of a screw having a knurled top, as shown in both engravings. The sleeve carrying the spindle can be clamped in any desired position in the chuck. The machine represented in Fig. 1 is operated by means of a hand wheel, the other being operated by a crank and beveled gears.

ROOFING AND CORNICE.

Instruction in Sheet Metal Work.

Numerous inquiries have been addressed to *The Metal Worker* from time to time in regard to trade schools where instruction is given in sheet metal pattern cutting. Diligent investigation has, however, failed to locate any institution where this branch of trade is taught. We are, therefore, glad to be able to announce that Charles R. Richards, director of the Department of Science and Technology in the Pratt Institute, Brooklyn, has authorized us to state that he is willing to arrange for the organization of a class in this trade in connection with the trade school of the institute, provided a sufficient number of candidates for instruction are forthcoming. We believe a sufficient demand for tuition in this important manual art does exist among the younger men of the roofing and cornice trade to justify Mr. Richards in forming a class, and trust that the opportunity may not be neglected. Mr. Richards will be glad to receive applications, personal or otherwise, at his office in the Pratt Institute, Ryerson street, between DeKalb and Willoughby avenues, Brooklyn, where he is usually to be found daily, except Saturday, from 9 a.m to 5 p. m., and on Monday, Wednesday and Friday evenings from 7.30 to 9 p.m.

Sheet Metal Lathing.

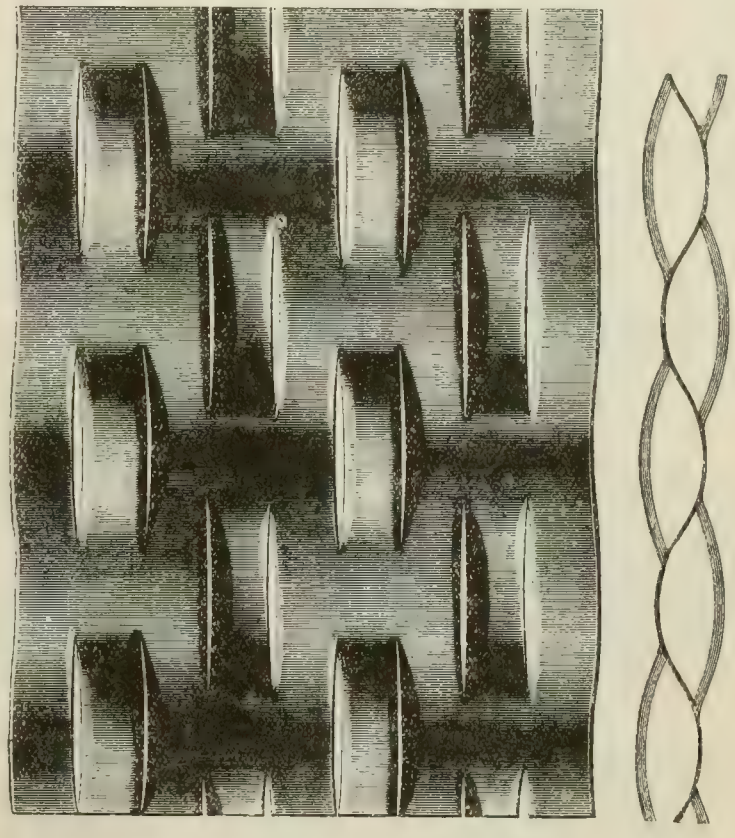
Metal lathing of a great variety of styles, beginning with small sheets of wire netting and going onward to complete sheets of metal with holes punched in them, has been used in this country for holding plaster to take the place of wooden lathing. The cut which accompanies this article shows a new form of metal lathing patented in England and manufactured by Hayward Bros. & Eckstein, Union street Borough, London, S. E., England. There are some peculiar features about this unlike anything which has heretofore been manufactured in this country. The nearest approach to this lathing is one in which bands have been punched down through flat spaces between small corrugations. It will be noticed that the edges of the projecting loops are turned upward or inward in such a way as to hold the mortar which is pressed down into it. This lathing is made in sheets, 6 x 2 feet, and it is said that a piece of plaster laid flat with 18 inches clear bearing easily supports 150 pounds in the center. It can be adapted to any form of boilers, pipes, &c. None of the metal is cut away, as will be seen by comparing the cross section with the plan. In England the cost is from 1¼ to 1½ pence per square foot, according to the character of the metal. The amount of mortar used in covering it is said to be less than that required for wood lathing, and that one coat less is necessary. Still another point which the manufacturers make is that the amount of time required for drying is considerably less.

FLASHINGS.

Gara, McGinley & Co., 13 South Seventeenth street, Philadelphia, Pa., publish a very interesting little pamphlet under the title of "House Smiths," which they are distributing to their friends in the roofing and sheet metal trades. The publication measures but 3½ x 6 inches, is bound in stiff board covers, and contains much to interest the house smith. The first four pages are arranged for serviceable memoranda. On two of the pages are lists of a variety of supplies, such as bathtubs, electric wiring, skylights, locksmiths', plumbers', roofers' and tinsmiths' work, &c. Opposite them are blank lines for the insertion of the name of the parties or firms to whom application should be made for work or supplies in the several departments. Some of the lines are filled up with the names of the publishers, one line, for example, reading: "For sheet metal work send to Gara, McGinley & Co., 13 South Seventeenth street." The latter pages contain "A Talk on the Roof," giving information about the construction and care of sheet metal roofs of different sorts. A feature of the book is a little brass chain attached to one corner with a brass eyelet for fastening to the wall.

The Cambridge Roofing Company, Cambridge, Ohio, have added numerous sheet metal specialties to their line of manufactures, which are principally iron and steel roofing, plain and corrugated. This company are now prepared to furnish eave trough, conductor pipe and all other material required to complete a metal roof.

Jacob P. Cresman, a tinsmith of 24 years' experience, has opened up a new tin shop at 137 West Main street, Norristown, Pa.



Sheet Metal Lathing.

The weight of a man is affected by the changes of the seasons. The prisoners in Hull Jail, says an exchange, were once weighed every day for a period of five years, and it was found that they increased regularly in weight from April to November, and decreased as regularly from November to March. The diet was the same all the year round, both in quantity and quality, and the temperature was kept even.

A heavy frost which visited the South at the beginning of last week caused severe injury to crops and vegetation in Tennessee, Louisiana and Mississippi. Cotton will, it is calculated, suffer to the extent of 15 to 20 per cent. of the crop.

World's Fair Awards.

Refrigerators and Hollow Ware.

Illinois—Chicago—Wickes Refrigerator Company, tile lined refrigerator room; Vienna Enamel Stamping Company, three awards, enameled steel ware, kitchen utensils, wainscotings; Belding Mfg. Company, household, grocers' and butchers' refrigerators; Paul Dalmicks, four awards, butchers' supplies, ice box, counter, block, meat sack; G. M. Shirk Mfg. Company, refrigerators, cabinets; Adams & Westlake, cans; D. R. Sperry & Co., Batavia, four awards, kettles, farm boilers, caldrons, drug mortars.

Indiana—Summit Refrigerator Company, Michigan City, refrigerators and sideboard refrigerators; Fred A. Wilke, Richmond, portable china kilns for firing decorated china and glass.

Ohio—Wagner Mfg. Company, Sidney, nickel plated cast iron ware.

Connecticut—Chapman Mfg. Company, Meriden, four awards, hardware specialties, silver, gold and nickel tea bells, sleigh and telephone bells, dog collars.

Wisconsin—Otto Zuietusche, Milwaukee, onyx and marble soda water fountain, sundry supplies; Wisconsin Refrigerator Company, Eau Claire, refrigerators and sideboard refrigerators; Jacob J. Volhath Mfg. Company, Sheboygan, enameled cast iron ware and sheet iron ware.

Michigan—Grand Rapids—Grand Rapids Refrigerator Company, refrigerators, sideboard refrigerators; John Matthews Company, refrigerators; Alaska Refrigerator Company, Muskegon, three awards, refrigera ors, ice chests, beer cooler; E. T. Barnum, Detroit, vases; Mrs. M. M. Harris, Detroit, refrigerator, the "M. M. Harris."

Pennsylvania—Griswold Mfg. Company, Erie, five awards, cast iron hollow ware, store furniture, house furnishing goods, cuspidors, post boxes; Charles Lippincott & Co., Philadelphia, soda water apparatus

Massachusetts—Boston—A. D. Puffer & Sons, soda water apparatus and all appliances; Smith & Anthony Stove Company, kettles; James W. Tufts, Chelsea, soda water apparatus and appurtenances; the Low Art Tile Company, art tile soda fountain, soda fountains; Paul J. Daemicke, Butcher Boy cooling room; Wolf, Sayer & Heller, butcher cooler; National Key Opening Can Company, key opening can.

Minnesota—The Hurd Mfg. Company, Duluth, refrigerators.

New York—Northern Refrigerator Company, refrigerators and all fixings; Iron Clad Mfg. Company, tinned, galvanized and enameled household or kitchenware, steel soda fountains, rotary ash sifters, utensils, cold handles, soda fountains, enameled sheet metal ware.

Maryland—Keen & Hagerty, Baltimore, tinned, stamped and japanned ware.

The following awards on plumbing and sanitary materials have been announced by the World's Fair Committee on Awards:

Illinois—Chicago—Lehner Johnson Hoyer Mfg. Company, plumbers' brass goods and house pumps; Norton Bros., water closets; Peck Bros. & Co., miscellaneous brass goods, brass railings and sanitary goods; Instantaneous Water Heating Company, instantaneous water heaters.

New York—New York City—Iron Clad Mfg. Company, riveted galvanized range boilers and welded galvanized range boilers; Stewart Ceramic Company, three awards, solid white crockery, stationary washtubs, bathtubs; Alberene Stone Company, alberene stone laundry tubs and sanitary and plumbing specialties.

Pennsylvania — Pittsburgh — Standard Mfg. Company, four awards, bathtubs, hollow ware, plumbers' ironware, sanitary goods; Dawes & Myler, New Brighton, bathtubs, plain and decorated laundry trays; McCambridge & Co., Philadelphia, brass materials for plumbers and porcelain water closets and lavatories.

Michigan—Detroit—Day Mfg. Company, bathtubs and heaters; Steel Bath Mfg. Company, steel clad bathtubs; Miss F. M. Goold, bathtub.

Massachusetts — Boston — Smith & Anthony Company, three awards, water closets, sinks and sanitary traps.

Connecticut — Waterbury—Randolph & Clowes, boilers and brass kettles.

Indiana—Indianapolis—Strong, Boyce & Co., water closets.

Ohio — Columbus — The Kilbourne & Jacobs Mfg. Company, wrought steel sinks.

Maine—Portland—E. M. Lang & Co., stick, drop and wire solder; Mosely Folding Bathtub Company, folding bathtubs, water heaters, separate and combined.

Foreign Countries.

Germany—Louis Wirtheim, Frankfurt, plumbers' supplies, asbestos cement and flat packings for joints of pipes, asbestos fiber and wicks for cocks and valves.

Austria — Vienna — Paul Dumont, bathtubs; L. Gutthmann, water closets.

British Guiana—Booker Bros., Georgetown, bath and vat, 600 gallons capacity of wallaba.

Sweden—Hoeganes Coal & Mining Company, The Sound, glazed earthenware pipes and tubs for sanitary purposes; Skronberge Coal & Clay Mfg. Company, Ekerly, salt glazed and other sanitary pipes.

Brazil—Canpantria Industrial, Rio de Janeiro, lead pipes.

Canada—S. C. Perkins, Ottawa, sink drop bath.

Japan — Hyogo — Awards for bamboo wares are given to T. Monishita, G. Matsuoka, M. Nakai, D. Nagata, S. Ohsashi and K. Toda.

New South Wales—W. T. Sinclair, Sydney, sanitary plumbing work.

A few exhibits in this group are not yet reported on and will be announced later.

Protection from Lightning.

(*Continued from page* 47, *September* 16.)

We now come to Lodge's book upon "Lightning Conductors and Lightning Guards," and shall get from it a more satisfactory understanding of his experiments and deductions. He believes that the current ideas on the character of the lightning discharge were not altogether correct, because the momentum of an electric current and the energy of an electrostatic charge had both been more or less overlooked. The application of the known fact of electrokinetic momentum revolutionized the treatment of certain phenomena. The old drain-pipe idea of conveying electricity gently from cloud to earth was thus proved fallacious, and the problem of protection became at the same time more complex and more interesting. His position, therefore, is not that lightning rods are useless, but that few or none of the present types are absolute and complete safeguards; and he believes it possible to so modify existing protective systems as to afford more certain protection. The problem is one, he very clearly shows, far removed from the old idea of conduction.

To day we know from the experiments of Hertz, Lodge and others that when an electric current flows steadily in one direction in a conductor its intensity is the same in all parts of the wire, but if it be of an oscillatory character—*i. e.*, a current reversing rapidly in direction—the interior of the conductor may carry far less than the surface carries.

All of which goes to prove the correctness of Snow Harris' opinion (and he probably studied the effects of lightning more exhaustively than any one else) that surface was more of a consideration in the form of a protector than solid section. In this matter of the form of a conductor we follow Lodge, and prefer the tape to the solid rod. Increase of surface diminishes impedance; and as impedance is probably at the bottom of side flashes and spittings, that conductor is to be preferred which offers less impedance, and hence tape appears to be preferable to rod. It is also more convenient, and it has also the advantage of being made either continuous or in very long lengths. The tape must be of dimensions sufficient to withstand melting or deflagration.

"Think now," says Lodge, "of a cloud and of the earth under it as forming the two coats of a Leyden jar, in the dielectric of which houses and people exist; we now have to consider what determines a discharge, and what happens when a discharge occurs. The maximum tension which air can stand is $\frac{1}{3}$ gramme weight per square centimeter. At whatever point the electric tension rises to this value, smash goes the air. The breakage need not amount to a flash, it must give way along a great length to cause a flash; if the break is only local, nothing more than a brush or fizz need be seen. But when a flash does occur it must be the weakest spot which gives way first—the place of maximum tension—and this is commonly on the smallest knob or surface which rears itself into the space between the dielectrics. If there be a number of small knobs or points, the glows and brushes become so numerous that the tension is greatly relieved and the whole of a moderate thunder cloud might be discharged in this way without the least violence. . . . But sometimes a flash will descend so quickly or it will have such a tremendous store of energy to get rid of that no points are sufficiently rapid for the work, and crash it all comes at once. One specially noteworthy case is when one cloud sparks into another and thence to the ground; or in general whenever electric strain is thrown quite suddenly upon a layer of air."

Thus, then, we begin to see that much will depend upon the character of the flash. There are many flashes, I believe, that the body could experience without very serious consequences; and there are many that will rive solid granite and shatter in splinters the heaviest masonry. With a kite in air during thunderstorms with a wire connection to the ground I have experienced sharp shocks with lightning flashes, which were perhaps side branches or minor spitting-off discharges.

The risk, then, will vary with the discharge, and this is influenced somewhat by locality, and therefore the methods of protection to be employed in the Mississippi Valley would be somewhat different in character from the methods appropriate for, say, the New England coast, the frequency of thunder storms in the one place compared with the other being about four to one. The character of the storm is also somewhat different. Then, again, the liability for places comparatively near is not the same. "If I urge on Glasgow manufacturers," said Sir William Thomson, "to put up lightning conductors they say that it is cheaper to insure." These manufacturers answered the man of science more wisely perhaps than they themselves knew. Thanks to the investigations of the Prussian Bureau of Statistics, we know now that in the main in thickly settled communities the risk is small. We can state with some certainty that there is but little need for the erection of expensive or elaborate lightning rods upon buildings standing among others in city blocks. We do not say that such buildings are never struck. As we have seen above, under some conditions "exposure" seems to have little to do with the determination of the path of discharge. The case is somewhat analogous to that of the trees and rocks upon a mountain side. However much they may determine the course of small streams and "trickles" down the mountain side, they are powerless to influence the course of an avalanche or landslide. Sometimes, there-

fore, such buildings are struck and severely injured (and as might be expected, with seemingly good protectors, do not entirely escape); but these cases are rare, and it may, we think, be safely set down that the rods upon city houses are not (as hitherto insisted upon by some) necessary. With country houses the conditions are different.

Our next question is: In flashes of ordinary intensity how much confidence may be placed in the protection afforded by a good conductor, rod or tape? Few questions have been so thoroughly discussed from a practical standpoint, and the verdict may be given in Sir William Thomson's words: "There is a very comfortable degree of security, if not of absolute safety, given to us by lightning conductors made according to orthodox rules."

If the reader is contemplating the erection of a lightning protector, these points may be of service to him:

1. Get a good iron or copper conductor of rod or tape form, preferably the latter. If copper, have it weigh about 6 ounces to the foot; if iron, about 2 pounds to the foot.

2. The nature of the locality will determine to a great degree the need of a rod. In some localities rods are imperative; in others, needless.

3. The very best ground you can get is, after all, for some flashes, none too good; therefore, do not imagine that you can overdo it in making a good ground. For most flashes ordinary "grounds" suffice, but the small resistance of even 1 ohm may be dangerous with an intense flash.

4. "If the conductor at any part of its course goes near water or gas mains it is best to connect it to them. Wherever one metal ramification approaches another it is best to connect them metallically. The neighborhood of small-bore fusible pipes and indoor gas pipes in general should be avoided."—*Lodge.*

5. The top of the rod should be plated, or in some way protected from corrosion and rust.

6. Independent grounds are preferable to water and gas mains.

7. Clusters of points or groups of two or three along the ridge rod are recommended.

8. Chain or link conductors are of little use.

9. Area of protection. Very little faith is to be placed in the so-called area of protection.

10. Indifference of lightning to the path of least resistence. Nearly every one who has written in late years has taken it for granted that lightning always follows the path of least resistance. This is not true. "It is simply hopeless to pretend to be able to make the lightning conductor so much the easier path, that all others are out of the question," says Lodge. This, however, requires modification. For the path will depend largely upon the character of the flash; and without doubt, for almost all flashes, a good lightning rod well earthed is the most appropriate path to earth.

11. Any part of a building, under certain conditions, may be struck, whether there is a protector on it or not. There are cases on record where edifices seemingly amply protected have been struck below the rods (not cases of defective connection), and it is now beginning to dawn upon us that (paradox of paradoxes) a building may be seriously damaged by lightning without having been struck at all. The Hotel de Ville at Brussels, perhaps the best protected building in the world against lightning, was damaged by fire caused by a small induced spark near escaping gas. During the thunderstorm some one flash started up "surgings" in a piece of metal not connected in any way with the protective train of metal "The building probably did not receive," says Dr. Lodge, "even a side flash, yet the induced surgings set up in it were so violent as to ignite some gas and cause a small fire." In other words, we had the condition of an "oscillator" in the cloud-flash earth and a "resonator" that responded with its little spark. In some experiments which we made last summer, simultaneously with some flashes, we got little sparks from a wire in the air.

12. So many people suffer so keenly from a kind of nervous alarm during thunderstorms that it is a great pleasure to be able to point out that the danger is vastly overestimated. "Heaven has more thunders to alarm than thunderbolts to punish," was the old irreverent way of putting it. One who lives to see lightning need not worry about the results.

13. The notion that lightning never strikes twice in the same place is erroneous. We have numerous cases disproving this.

14. If you are near a person who has been struck by lightning, go to work at once to try and restore consciousness. Try to stimulate the respiration and circulation, and do not cease in the effort to restore animation for at least one hour.

HEATING AND PLUMBING.

NEW WORK AND CONTRACTS.

A NUMBER OF CHURCH HEATING CONTRACTS have been awarded to Edward Dunn of 104 Market street, Newark, N. J. Among them are the St. Aloysius Church on Bowery street, Newark, where a horizontal tubular boiler was used. In the St. Leo's Church at Irvington an upright tubular boiler was used, and in the St. Nicholas Church and school at Passaic, N. J., a Mills steam boiler, made by the H. B. Smith Company, was used. The radiators in each case were those of the H. B. Smith Company.

SEALED PROPOSALS will be received at the office of the Supervising Architect, Washington, D. C., until November 10, for the plumbing of the United States Court House, Post Office, &c. extension, at Dallas, Texas. Drawings and specifications may be obtained from the Supervising Architect at Washington, or at the office of the superintendent at Dallas.

H. C. AYER of Richford, Vt., has just completed the installation of a Boynton steam heating apparatus in the American House, in that place.

C. E. CHANNELL, Rutland, Vt., has received the contract for the plumbing on the engine houses at a cost of $849.50.

AT A RECENT MEETING of the Common Council of Newton, Mass., an order was passed appropriating $2900 for a new heating apparatus for the city hall.

THE SECRETARY of the Building Committee of Omaha, Neb., has been instructed to advertise for bids for sewerage, plumbing and gas fitting for the Long School.

THE CONTRACT for heating the new annex of the school building at Twelfth and Windsor streets, Reading, Pa., has been awarded to H. C. Geissler.

A STEAM HEATING PLANT is being erected in the Hotel Royal on Dundoff street, Carbondale, Pa.

NEW WATER CLOSETS are to be placed in the court house at Ottawa, Ontario, an order having been passed to that effect at a recent meeting of the Building Committee.

A LARGE STEAM HEATING BOILER has been placed in the basement of the J. Miller Thomas Building, at Wilmington, Del., and the building of the New Castle Insurance Company, next door, is to be heated by the same plant. The plant is said to have a capacity to heat several other buildings, and is looked upon as something of a novelty in that city.

B. H. HILLIAR of New London, Conn., has been awarded the contract for heating the new Odd Fellows' Home, at Groton, Conn. The Richmond sectional heater will be used, having been selected, we are informed, after a competition with several other heaters, which were carefully examined by the committee.

WALTER P. DUNN, 98 Market street, Newark, N. J., has recently completed the work of heating and plumbing in two houses at East Orange, N. J., for Dr. C. S. Stockton. Thatcher hot air furnaces were used for heating apparatus.

ONE OF THE HEATING CONTRACTS that is now attracting the attention of the trade is for a large factory building being put up by Tiffany & Co. of New York, at Woodside, a suburb of Newark, N. J.

THE E. BEST PLUMBING COMPANY of Quincy, Ill., have been awarded the contract for putting in the steam heating pipes and other work for the Frost Sewer Pipe Company at Macomb, Ill., at a reported price of $3000.

E. BAGGOT, 169 and 171 Adams street, Chicago, is to do the plumbing, gas fitting and sewerage in the residence of F. S. Johnston, Prairie avenue, near Twenty-second street.

J. J. WADE & SON, 298 Dearborn street, Chicago, have the contract for plumbing in the New York Life Insurance Building, La Salle and Monroe streets. The Wade sanitary fixtures are to be used throughout the building.

THE WALCOTT-HURLBUT COMPANY, 175 and 177 Lake street, Chicago, are to furnish Maelstrom syphon jet closets, enameled arm baths, Tennessee marble lavatories and other plumbing fixtures for the Lakeside Club House, Drexel boulevard and Forty-second street.

GEO. D. HOFFMAN, manager of the J. F. Pease Furnace Company, 82 Lake street, Chicago, has the following contracts on hand: First Presbyterian Church, Waukegan, Ill., steam heating, for which two horizontal tubular boilers will be required; residence of T. S. Fauntleroy, Lake Forest, Ill., Economy heater, combination of hot water and warm air; Edgewood Academy, Madison, Wis., steam heat, requiring two horizontal tube boilers and 4000 feet of radiation; Mrs. Burnap's flat building, 4212 Ellis avenue, Chicago, No. 10 Bronson steam boiler. American radiators are to be used for above contracts.

It is probable that New Haven, Conn., will spend $100,000 in repairing several of its bridges.

WORLD'S FAIR NOTES.

Geo. E. Nye

of 74 and 76 West Washington street, Chicago, makes an interesting exhibit at Column K 30. The Nye pump is of peculiar appearance, consisting of two rectangular chambers mounted on a tripod. These chambers are of cast iron. There are no pistons, but the pump is operated by the formation of a vacuum through the condensation of the exhaust steam. A small condensing chamber is placed in the rear of the two rectangular chambers. The parts are very simple, steam being admitted by a balanced automatic valve on the top of the chambers, while the suction and delivery ports are covered by four common claque values. But little floor space is occupied, and a very small amount of steam is used. One of the pumps shown in operation works admirably with the supply pipe valve almost closed. It works so smoothly that it requires no bolting down, and it will pump from 40 to 60 per cent. of sand without injury. The exhibit includes a pump with a capacity of 1000 gallons per minute, which is the largest kept in stock. Larger sizes are made on special orders, from patterns on hand.

The Deming Company

of Salem, Ohio, have a fine exhibit of steam and hand pumps at Column K 33, which has already been described in these columns. The display of hand and windmill pumps is worthy of notice in this connection. There are quite a number of exhibits of this character.

The Downie Pump Company

of New Brighton, Pa., make an exhibit at Column L 35 of pumps for deep wells. Their pumps are intended specially for artesian wells, but are adapted to any water service where the supply is obtained from wells. These pumps are shown in operation, and comprise double and single-acting for steam, belt or wind power.

The Hayes Pump & Planter Company

of Galva, Ill., make a very good display at Column L 34. Their specialty is double cylinder pumps for hand or power. These are shown in a variety of sizes, some being in operation. There is also an array of force and windmill pumps of different styles arranged attractively. The company manufacture three and six cylinder power pumps for service in pumping a large volume of water.

Sandwich Enterprise Company

of Sandwich, Ill., make an exhibit at Column K 35. The special feature of this exhibit is an aërating pump, which has but recently been brought out, for the purpose of purifying cistern water. It is an iron pitcher pump with the valves so arranged that they can be reversed by suitable levers. When reversed the pump works down instead of up and forces air into the cistern through the perforations in the lower part of the pipe. The reversing operation is almost instantaneous. The pump is shown in operation attached to a glass tank filled with water. Other pumps shown are windmill and force pumps in a variety of patterns.

Bucket Pump Company

of 441 Plum street, Cincinnati, also show purifying cistern pumps at Column K 29. One of these is in operation, with a dummy appropriately clad as a farmer's boy attached to the crank, so that he is constantly in motion, attracting much attention. The tank has glass sides to permit the aëration of the water to be seen. This pump has a series of buckets which conduct a supply of air into the water whenever the pump is at work.

H. Dickinson & Son

of Lowell, Lake County, Ind., exhibit another water purifying pump at Column L 34 This pump is composed of an endless chain, along which at regular intervals galvanized iron buckets are attached. Each of these cups is perforated at the bottom to allow the gradual escape of air from it as it goes bottom upward into the water. The bottom wheel is of such construction that it becomes an agitator also and assists in purifying the water. One of these is shown in operation in a glass inclosed tank.

The Rider Engine Company

of Walden, N. Y., have a very fine exhibit at Column K 36 of Rider and Ericsson hot air pumping engines. Many of these are in operation, the air being heated by gas jets. Some of them are used to force water to a considerable elevation. Familiar as these engines have now become in most sections of the country, the exhibit is constantly surrounded by groups of eager observers to whom the motive power is a deep mystery. The company have branch offices at 37 Dey street, New York, and 88 Lake street, Chicago.

The Detroit Lubricator Company

of Detroit, Mich., also have a very pretty display at M 25. They have erected a handsome booth, the front of which is inclosed by a railing made of pipe fittings and hot water valves, the latter being so arranged that the hand wheels make effective decorations. Five awards have been bestowed on this company, covering their locomotive and stationary lubricators, glass and brass oilers, low water alarms and hot water valves. A medal and diploma were awarded their locomotive lubricator.

Trimont Mfg. Company

of Roxbury, Mass., make an exhibit at Column M 31 of their Trimo wrenches. These wrenches are made with removable pipe jaws in a variety of sizes adapted to all classes of work. The Trimo combination wrench shown has double jaws, projecting on opposite sides, one set for plain work and the other for pipe.

The Brass & Iron Works Company

of Fostoria, Ohio, have a comprehensive exhibit at Column K 28. It covers a variety of tapping machines for tapping street mains, which are shown applied to pipes in position for work; a large number of well finished brass valves and couplings, and an array of special pipe fittings. These fittings are intended for use on iron pipe without cutting threads, and on lead pipe without the use of solder. The device is an ingenious one and accomplishes its purposes effectively. Another exhibit is a well drilling machine, with engine and tools complete, which stands ready to sink a well for natural gas, oil or water. There is also shown a line of Able's patent gate valves for water works service.

Crescent Lock Joint Stove Pipe.

The accompanying cuts represent Crescent lock joint stove pipe, introduced by Logan, Gregg & Co., Pittsburgh, Pa. One edge of the iron is grooved and pierced, as shown in Fig.

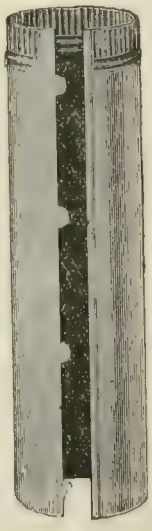


Fig. 1.—Showing Lugs and Groove.

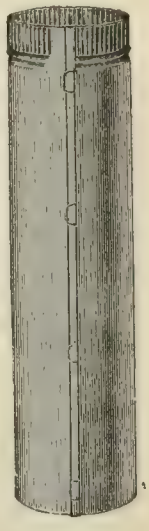


Fig. 2.—Lugs Turned Back.

Crescent Lock Joint Stove Pipe.

1, to receive the lugs formed on the other side. When joined the lugs are turned back, as in Fig. 2, holding firmly, it is stated, and making a perfectly smoke tight joint. The pipe is

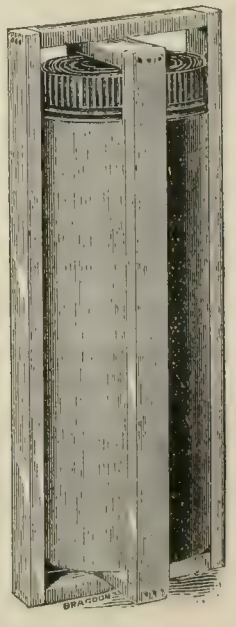


Fig. 3.—Manner of Crating Pipe.

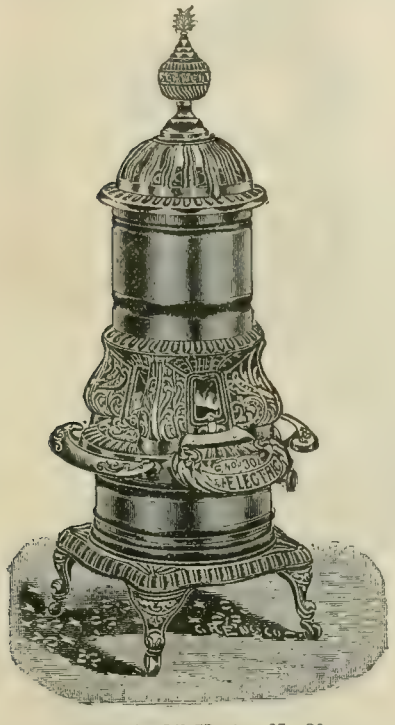
made in 4, 5, 6 and 7 inch sizes, packed as in Fig. 3, in crates of 25 joints, for shipment. The manufacturers state that they are having a large demand for the pipe wherever it has been introduced.

In a recent lecture Professor Unwin stated that compressed air transmission is practical up to at least 20 miles; 10,000 horse-power can be transmitted 30 miles in a 30-inch main at 132.3 pounds per square inch, with a loss of pressure of only 12 per cent.; the efficiency is 59 to 73 per cent. if the air is reheated, and 40 to 50 per cent. if it is used cold.

THE RETAIL STORE.

Electric Oil Heaters

The Electric Oil Stove Company of Homer, Mich., are using, in connection with the new designs of heating stoves, a burner which is claimed to effectually control the flame, while consuming the gases of combustion in such a way as to give a pure white light of great



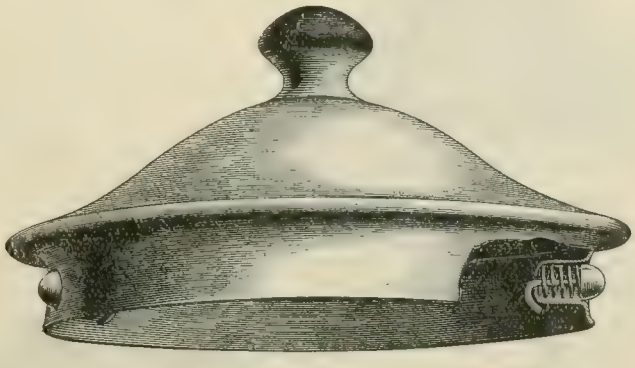
Electric Oil Heater No 30.

volume and intensity. The wick raiser, in combination with the rewicking attachment, is said to be strong and positive in its action, and that all weak points in its mechanism have been overcome. An interesting feature of the Electric oil heater is the water reservoir in the burner. The interior of the drum of the stove is arranged to arrest and retain the heat, making it a strong radiator, while four ventiduct flues exposed to the direct action of the fire create a constant circulation of hot air through the stove and aid in the uniform distribution of the heat. The oil tank, water reservoir, wick tube, &c., are made of rolled sheet brass. The capacity of the oil tank is about 1 gallon, the location being such that the cold air passes entirely around it, thus keeping the oil cool. An ornamental drop mica door gives easy access to the burner for lighting, without the necessity of tipping back the upper part of the stove. The castings are highly polished and nickeled, giving a brilliant effect. The stove here illustrated is known as the No. 30, and is claimed to have a heating capacity of from 2000 to 2500 cubic feet in cold weather. The diameter of the stove at the base is 16 inches and the hight 38 inches.

The company have also brought out what is known as their No. 5 Electric, designed to meet the call for a low priced oil heating stove which can be converted into a cooking stove when necessary. This is especially intended for heating sleeping rooms, conservatories, bathrooms, &c. The drum around the combustion chamber and also the radiating drum have double walls, forming a continuous flue for carrying the cold air around the oil tank, and then passing it into the interior of the radiating drum, and out at the top of the stove in a highly heated condition. By removing the radiating drum the stove is made available for cooking purposes. It is equipped with the improved Electric burner and uses a 9-inch circular wick of double thickness.

Cover with Springs.

Boas Brothers, 231–325 Greenwich street, New York, are using their patented springs on tea and coffee pot covers, in connection with their Adamant enameled ware, as illustrated herewith. The springs and knobs are made of brass to prevent rusting, the spring holding the knob against the inside of the rim of the pot with enough force to prevent the cover from falling off when pouring from the pot. There is no offset on the inside of the pot's rim, so the cover may be lifted off almost as easily as if the springs were not there.



Cover with Springs.

Champion Egg Opener.

The Champion egg opener is offered by the Magic Introduction Company, 321 Broadway, New York. The handles are loop shape, similar to scissors handles. The curved pieces which surround the egg are provided with sharp teeth, so as to cut off the top of the egg shell. The opener is designed for table use, to obviate the unpleasant results that accompany opening soft boiled eggs with a knife or spoon ; also for use in the kitchen, by which the contents of the egg are exposed while yet in the shell, thus avoiding the spoiling of a bowl full of good eggs by dropping a bad one into them. The openers are made in nickel and silver plate, embossed, the silver plated ones being put up in satin lined cases.

HALL BROTHERS of Lincoln, Neb., have recently filed articles of incorporation with the Secretary of State under the name of the Hall Bros. Company, the business of the concern dating from October 16. The incorporators are H. J. Hall, Charles Hall, J. E Hall and J. L. Baxter, and the capital stock of the company $10,000. The business will consist of the sale of stoves, ranges, furnaces, &c.

A Road Skate.

A writer in the *Ironmonger* says: A rather formidable competitor of the cycle has made its appearance in the Midlands in the shape of a pneumatic road skate. It has lately been seen in the streets of Birmingham, and, judging from the admiration it excites, is not unlikely to find its way soon into all parts of the country. The invention, which was patented a short time ago by a Scotch firm, is evidently derived from the old roller skate of skating rink celebrity; but, whereas the ordinary roller skate has four wheels, the pneumatic skate has only two, placed in line at either extremity of the skate. The wheels are rather larger than those of the roller skate, and, instead of solid rubber, are covered with pneumatic tires. The patentees claim for them that one can skate over ordinary turnpike roads with them the same as on ice and at even greater speed, while at the same time they will easily ascend and descend hills. Six or seven miles an hour, however, is the maximum speed attempted in the streets of Birmingham, and that only on smooth roads. One obvious advantage of the pneumatic skate over the pneumatic cycle is that punctured tires may be readily replaced, as the skater may carry surplus tires, or even reserve wheels ready fitted, in his overcoat pocket.

THE SUDDEN DEATH of Charles W. Cotchett, who represented the Peck, Stow & Wilcox Company to the trade of this city and vicinity, occurred October 18, and is appropriately announced by the company. They speak of him as a young man of sterling intergrity, faithful to their interests, beloved by his associates and popular with their customers. The funeral services, October 20, from his late residence, were attended by the New York managers and employees in a body, the store having been closed for that purpose.

Oil and Gas Heaters.

The accompanying cuts represent three styles of a line of oil and gas heaters manufactured by the Manhattan Brass Company, 44 Murray street, New York, and 506 Masonic Temple Building, Chicago. Fig. 1 shows the No. 40 Star heater, which is made entirely of brass, with the exception of a Russia iron drum and aluminum top or cover. The base is nickel plated, of attractive design, with central draft burner and large wick. The wicking arrangement is simple, the wick being slipped over a cylinder, which expands at the top as the cylinder is turned down, and is thus held in place by teeth, without the aid of bands or tying. The wick is raised or lowered by turning the thumb screw either above or below the base. By turning the small projecting knob in the oil reservoir funnel, which is opposite the wick raiser, a register is opened, and into this funnel the oil is poured when filling. An indicator in the center of the funnel shows the amount of oil in the reservoir, whether full, half full or empty, enabling one to see at a glance when the reservoir needs replenishing with oil. The drum is held in position on the rim by a loose hinge and spring; in lighting the heater the spring is pulled back and the drum is tipped backward. The rim is perforated at the bottom, and the drum has perforations at the top as well as in the sides. When it is desired to heat anything at the top of the drum, or to have the heat ascend, the aluminum top is taken off, leaving a flat surface. The point is made that the movable top, being made of aluminum, will not discolor. The manufacturers claim that there is no disagreeable odor from these brass heaters, that 1 gallon of kerosene will heat a room 8 to 12 hours, and that the heaters may conveniently be carried from place to place. The heater is made with three other styles of bases besides the one shown, one of these bases being square. Bases are furnished in brass finish, nickel and all brass; also with brass drum. The Hygienic heater, shown in Fig. 2, besides embodying the advantages of the Star heater, has a water tank to moisten the atmosphere. The tank surrounds the burner and is designed to hold enough water to keep up evaporation until the oil tank needs replenishing. The deflector, which in Fig. 2 is being held in the hand, has perforations at the inner edge through which the vapor passes as it rises from the heated water. Thus rising close to the flame, the moisture is thrown out into the room. The No. 48 heater weighs 12 pounds, is 33 inches high and has a drum 9 inches in diameter. The drum and movable top of the gas heater in Fig 4 are the same as used on the oil heaters. It is claimed that the gas burner is so constructed that the gas is superheated before being burned, in this way utilizing the gas to better advantage than in the ordinary burner.

Fig. 1.—No. 40 Star Heater

Fig. 2.—No. 48 Hygienic Heater.

Fig. 3.—Drum for Hygienic Heater.

Fig. 4.—Gas Heater.

Twenty vessels and 54 lives was the total loss on the great lakes during the furious storm which swept over them last week. The value of property lost is estimated at over $700,000.

STOVE TRADE NOTES.

The World's Fair Awards.

The work of the World's Fair judges having practically been completed, announcements are now appearing of the various exhibits that have secured awards of medals or diplomas. Many stove merchants will doubtless wonder why it happens that the leading stove companies, a number of whom made exhibits at the fair, have not received awards. Their customers also may wonder why so many apparently insignificant articles have won medals and diplomas while most artistic and scientifically designed stoves have been wholly overlooked. The fact may be forgotten by this time, but in July last we published an important statement bearing on this particular question.

For reasons best known to themselves the following concerns at that time withdrew their exhibits from competition for premiums or awards: Rathbone, Sard & Co., Peninsular Stove Company, Buck's Stove and Range Company, the Michigan Stove Company, the Fuller-Warren Company, Cribben, Sexton & Co., Chicago Stove Works, Wm. Resor & Co., Orr, Painter & Co., the Collins & Burgie Company, Abendroth Brothers, the Thomas, Roberts, Stevenson Company, Co-operative Foundry Company of Rochester, Wm. Miller Range & Furnace Company, Estate of P. D. Beckwith, Richardson & Boynton Co., the Wilcox Water Heater Company. This list covers a very large majority of the stove companies who made exhibits. They had the option of either permitting their goods to enter into competition with others in the same line or of withdrawing them and they preferred to take the latter course.

The same policy was pursued by very many exhibitors in other lines, who either did not value the medals and diplomas to be given, or were not willing to trust to the decision of judges who might not be experts competent to decide as to the special merits of the articles in which these exhibitors were interested, although competent to pass upon other matters coming under their jurisdiction. In some cases the mass of exhibitors from certain foreign countries withdrew exhibits from inspection for awards without regard to the classes in which they had been thrown.

There is nothing singular, therefore, about the action taken by these stove manufacturers. They could have permitted their stoves to be judged if they wished to do so, but they exercised their right as exhibitors in withdrawing their goods, and consequently no medals, no diplomas, no awards of any kind.

Air Filters for Furnace Supply.

BY L. M. W.

The amount of dirt that finds its way into a house through the air supply to a furnace has been found a serious matter in many cases. Sometimes it is pure and simple dirt that has been taken up and brought in by the air current and deposited on the furniture and carpets. The sharp fine grit may destroy the polish on furniture, at other times it may be blown against and deposited on pictures, ceilings, cornice or frescoing, which soon need to be restored at a considerable expense. While this is true of dust or dirt, a much more lamentable effect is noticed from the soot laden air of some soft coal burning cities. With the increasing elegance of homes the question of disposing of this destroyer becomes more important and will demand more attention in the future than it has in the past. At present the ruin it effects is endured largely because to the average mind no remedy seems applicable to the trouble. A simple air filtering device, however, has been used with results that are sufficiently satisfactory to warrant a description of its construction. An enlargement is made in the cold air box for a space of from 4 to 6 feet, according to its dimensions, so as to double its capacity. For example, if the box was 15 x 30 inches it should be enlarged to 30 x 30 inches for a space of 5 feet, as shown in Fig. 1. About midway of the 5-foot space on one side there should be a door 3 feet wide and the other dimension the full size of the box. This is to permit the insertion and the removal of a wooden frame to which the filter is attached. The frame is of the full dimensions of the box and long enough to just go through the door snugly. Strips 1 inch square should be fastened to the top and bottom of the box, running across it, to hold the frame in its proper place, particularly when the enlargement is made on an upright portion of the box. This frame, Fig. 2, is to receive the filtering material, which should be any loose woven cheap material, preferably cheese cloth. At each end of the frame and on each side holes are bored about 3 inches apart to receive a ⅜-inch rod, over which the cloth is stretched. The cloth is woven

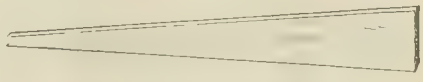


Fig. 3.—Air Filter Wedge.

Air Filter for Furnace Supply —Fig. 1.—Vertical Section Taken Lengthwise.

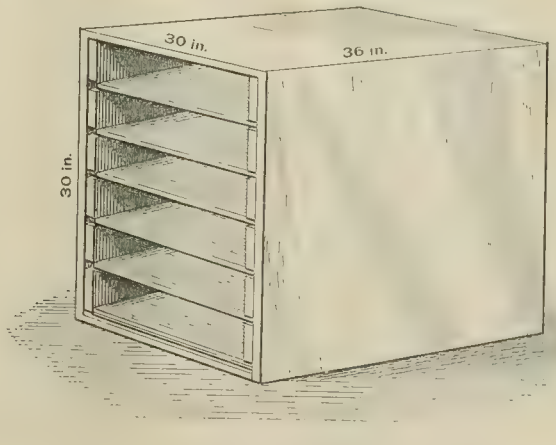


Fig. 2.—Frame for Filter with Cloth Stretched.

over the rods in a zigzag fashion and the ends secured by nailing a narrow strip over them and to the frame. In order to prevent the air from passing by the edges of the cloth wedge shape strips, shown in Fig. 3, must be provided to insert in the spaces between the cloth on both sides of it and at each side of the frame. It will take several yards of cloth to make such a filter. After the first cloth is stretched it is easy to put in another, by sewing the new material to the end of the old cloth and simply pulling it through the rods after the wedges have been removed. The more fre quently the cloth is renewed the cleaner the air will be. In dry, windy weather dust accumulates very quickly, and is liable to be deposited in the filter, whether it is placed horizontally or vertically, in such quantities as to close a large portion of the cloth. It is highly important that the cloths shall not remain so long in use as to become clogged and reduce the air supply to an extent that the furnace is stifled and overheated, when it will render poor service, waste fuel, and some part may be destroyed as the result. Such a possibility can be avoided by closely watching the cloth. Cloths that have remained in use a month have in some cases done excellent service, and shown that their use is highly beneficial, but have also shown by their condition that they should have been renewed much sooner. The excellent work the filter does, however, overbalances the watchfulness and little labor necessary for its renewal, while the cost of the cloth is insignificant. The enlargement of the air box is to provide an air chamber on both sides of the filter and to enable the use of a filter with an expanse of surface so large as not to materially obstruct the air current. When used in this form, and the cloth frequently renewed, much benefit has been derived from the freedom from dust which it insures. A modification of this filtering device could be used in connection with indirect steam and hot water heating stacks that would not only purify the air, but would likewise prevent the accumulation of dust on the heating surface, which impairs its efficiency.

A New Trade-Mark.

We present herewith an illustration of the new trade-mark of A. Weiskittel & Son of Baltimore, Md., which they say has been adopted for their general line of gas stoves. This information comes to us on a new letter head containing the trade-mark and motto "Most Com plete Plant in the World," and on an engraving of a handsome oven door at the left are the words, "Iron Founders, Brass Founders, Brass Finishers and Nickel Platers." At the right is the firm name, above which are the words, "Established 1850," and below the statement that they manufacture fine stoves, ranges and fire place heaters. The letter states that they believe they are the first manufacturers of gas stoves to adopt a trade-mark of which they will make a specialty in advertising their gas stoves. During the last year they have made extensive improvements in their plant, among them being the addition of a brass foundry and complete brass finishing department. It contains all the latest tools and machines for the manufacture of gas cocks and other fittings belonging to gas goods. The company also state that at present their plant is running full time, a considerable demand existing for their gas heating stoves and other goods.

Future of the Hot Air Furnace.

By A. W. Glessner,

President of the Excelsior Steel Furnace Company.

FUEL ECONOMY.

One of the first questions asked by the prospective purchaser of a hot air furnace is "How much fuel will it take to heat my house with your furnace?" and the aforesaid and prospective purchaser expects to receive a definite reply without considering the fact that it is impossible for any one to predict the amount of fuel a furnace in any particular house will burn unless he knows in advance not only the conditions which affect the working of the furnace, the character of the building and nature of the smoke flue to which the furnace is to be attached, but also the general climatic surroundings of the house.

Notwithstanding the fact that no dealer can safely guarantee the consumption of fuel by any particular furnace in any particular place, a great many dealers have given guarantees upon the fuel to be burnt and have suffered in consequence. No two furnaces, though placed in buildings of the same size, standing side by side, will perform their work in exactly the same way with the locations of the furnace and the conditions apparently identical.

Why this should be so no one has yet been able to determine. It is possible that one solution of the problem would be that no two houses can be built exactly the same, that one building may be exposed a little bit more than another immediately adjoining the same. Also, the fit of the windows and doors may be different in different houses, and thus affect the heating of the same.

If one could know in advance exactly the circumstances and conditions of each and every job a dealer might estimate very closely the consumption of fuel, and yet this consumption of fuel would be modified very greatly by the management of the furnace itself, and also by the character of the occupants of the building to be heated.

Thus, owing to the uncertainty of estimating closely the fuel consumption of furnaces, the makers of furnaces have given to their heaters a varying capacity, which allows for considerable leeway in the capacity of furnaces in question, and leaves to the dealer the matter of the selection of the size to be used in the different houses in which he installs heating apparatus.

The fuel consumption or fuel economy of furnaces depends also very largely upon the selection of the proper size for the house in question. In many cases it has been found advisable to use large size furnaces in houses of moderate size when the exposures are very bad or the location where very high winds from the north or northwest prevail during the winter months.

COMPARATIVE FUEL CONSUMPTION.

A dealer is frequently asked, when figuring on heating a building with a hot air furnace, to state to the owner whether or not his heating apparatus will consume more or less fuel than will the steam or hot water plant which is being advocated by some other contractor, and many dealers are at a loss to estimate the comparative fuel consumption of the different systems of heating now before the people.

The experience of heating contractors and engineers in heating dwellings of fair size, say from 25,000 to 40,000 cubic feet, is that the consumption of fuel by the hot air furnace is no greater on the average than with hot water or steam, or with either of these systems in combination with hot air.

If this statement can be relied upon, and it has been attested to by the experience of many, the hot air furnace really stands foremost, for the reason that in almost every furnace job the supply of air comes wholly from without and this air is taken into the furnace at a temperature from 60° to 100° below the temperature at which it is sent into the rooms above, and this is a performance that certainly is remarkable and calls for a very high degree of economy on the part of the heater.

On the surface it would appear that steam and hot water would have a decided advantage over hot air, and the same is true of buildings of large size, but for dwellings of moderate size it can be steadily asserted that the hot air furnace will sppply air at as low a cost for fuel as any other system on the market.

(To be continued.)

A New Trade-Mark.

DeHaven & Co., Limited, Pittsburgh, Pa., are offering to the trade a new open front parlor stove, which they have named the Perfect Cinderella Franklin. This stove is referred to as having patent automatic blower, draw center basket grate, and is fully embellished with nickel and tile. Its qualities for heating purposes are also emphasized, and the statement is made that the defects common to Franklin

stoves have been removed. It is made in three sizes, Nos. 12, 14 and 16, and full information concerning it will be furnished by the firm upon application.

Fluxes.*

Fluxes is the name or term applied to a substance which imparts igneous fluidity to metals when in a molten state, and has the power to separate metals contained in metallic ores from the non-metallic substance with which they are found in combination, and also to separate from metals, when in a fluid state, any impurities they may contain. Fluxes are also used for the purpose of making a fluid slag in furnaces to absorb the non-metallic residue from metals or ores and ash of the fuel and removing them from the furnace to prevent clogging and keep the furnace in good working order. The materials used as fluxes for the various metals consist of mineral, metallic and chemical substances found suitable for separating metals from their ores and cleansing them of impurities, and are numerous and varied in nature and composition. But this evening we shall only consider those employed in the production of iron and the melting of iron for foundry work. The mineral substances employed for this purpose are numerous, but they consist principally of the carbonate of lime in its various forms, the principal one of which is limestone.

Foundrymen long ago conceived the idea of using limestone as a cupola flux. In many foundries it is the practice to use a few shovels or a few riddles of finely broken limestone in the cupola on the last charge of iron, or distributed through the heat a few handfuls to each charge of iron. The object in using limestone in this way is not to produce a slag to be drawn from the cupola, but to make a clean dump and a brittle slag or cinder in the cupola that can be easily broken down and chipped from the lining when making up a cupola for a heat. Limestone used in this way does not produce a sufficient quantity of slag to absorb the dirt from the iron and ash of the fuel and keep the cupola open and working free, but rather tends to cause bridging and to reduce the melting capacity of the cupola. The making of a brittle cinder in a cupola by the use of limestone depends to a great extent upon the quality of the stone. The results obtained from the use of limestone in small quantities in a cupola are so uncertain that I do not think they justify a foundryman in using it.

The tendency of slag or cinder in a cupola is to chill and adhere to the lining just over the tuyeres and prevent the proper working of the furnace. So great is this tendency to bridge that a small cupola will not melt properly for more than two hours and a large one for more than three hours. To overcome this tendency to clog and bridge foundry men in many cases have adopted the blast furnace plan of using a large percentage of limestone as a flux in their cupolas and tapping slag.

When a large percentage of limestone is charged it forms a fluid slag. This slag settles through the stock to the bottom of the cupola, and in its descent absorbs the ash of the fuel and dirt or sand from the iron and carries them to the bottom of the cupola, where the slag and dirt it contains may be drawn off and the cupola kept in good melting order and in blast for days at a time.

The amount of limestone required per ton of iron to produce a fluid slag depends upon the quality of the stone, the ash of the fuel and the condition of the iron to be melted. It is the custom in some foundries where the sprues and gates amount to from 30 to 40 per cent. of the heat to melt them without milling to remove the sand, and to use enough limestone in the cupola to produce a sufficient quantity of slag to absorb and carry out of the cupola the sand adhering to them. In this case a larger percentage of limestone is required than would be required if the sprues and gates were milled and only clean iron melted. Poor fuel also requires a greater amount of slag to absorb the ash than good fuel, and a lean limestone must be used in larger quantities than a stone rich in lime. The quantity required to produce a fluid slag amounts to from 25 to 100 pounds per ton of iron melted. The weight of slag drawn from a cupola when the sprues and gates are not milled and the cupola is kept in blast for a number of hours is about one-third greater than the weight of limestone used. When the sprues and gates are milled the weight of the slag is about equal to the weight of the limestone. When the cupola is only run for a short time and slag only drawn during the latter part of a heat the weight of slag is less than the weight of the limestone. The slag drawn from a cupola has been found by chemical analysis to contain from 4 to 7 per cent. of combined iron and numerous small particles of shot iron mechanically locked up in the slag, which cannot be recovered except at a greater cost than the value of the iron. In a number of tests made in the same cupola to ascertain the percentage of iron lost in melting when the cupola was slagged and when it was not slagged, I found the loss of iron to be from 3 to 4 per cent. greater when the cupola was slagged.

Effect of Flux Upon Iron.—Many of the limestones and other mineral substances employed as cupola fluxes contain more or less finely divided oxides, silicates, &c., in combination with earthy materials. The conjoined effect upon iron of these diffused impurities in a cupola is to prevent the metal from running clean in the mold or making sharp, sound castings, and the tensile and transverse strength is frequently impaired by them. The tendency of the cupola furnace is to clog and bridge over the tuyeres, and concentrate the blast upon the iron through a small opening in the center and injure its quality. If by the free use of limestone we prevent bridging and keep the furnace working open and free we avoid injuring the iron in melting by the concentration of a strong blast upon it. The effect, therefore, of limestone in a cupola is not to improve the quality of iron, but to prevent its deterioration in melting.

The Action of Fluxes on Linings — Limestone and other minerals employed as fluxes frequently contain impurities which enter into combination with the lining material of a furnace and render it fusible. This fact was fully illustrated at the foundry of John D. Johnson & Co., Hainesport, N. J., a few weeks ago. The cupola front had been put in with new molding sand for a long time and no flux used in the cupola. The sand made an excellent front that resisted the action of the heat and molten iron upon it. As the heats enlarged it became necessary to use flux and top slag to run off the heat. Oyster shells were used and produced a slag that flowed freely from the slag hole and had no effect upon the sand in the front. When the supply of shells became exhausted a limestone was used in place of them. Trouble then began with the front. It was melted by the flux into a thick tough slag that settled down and closed up the tap hole, and the iron could only be drawn by cutting away a large portion of the front to enlarge the tap hole. Mr. Johnson called at my office to learn what could be done to keep the tap hole open. I advised that the front material be changed and a mixture of fire clay and sharp sand be used instead of molding sand. This was done and there was no further trouble in keeping the tap hole open and in good order to run off the heat. This serves to illustrate the effect of fluxes upon lining material.

From the various qualities of cupola brick and lining material now in the market a lining may be selected that will resist the action of almost any flux or slag, and foundrymen may select a flux to suit the lining or a lining to suit the flux, whichever they find it to be the most profitable in their locality.

How to Slag a Cupola.—Foundrymen sometimes experience trouble in slagging their cupolas. This is largely due to lack of knowledge in charging the limestone and drawing the slag, for any cupola can be slagged if properly worked. To draw slag from a cupola a sufficient quantity of limestone or other slag producing material must be charged in the cupola with the iron to make a fluid slag. The exact amount required can only be learned by experimenting with the fluxing material used, but is generally from 50 to 60 pounds of good limestone per ton of iron when the remelt is not milled. The limestone is generally charged on top of the iron, and is put in with each charge after the melter begins using it. No limestone is used with the iron on the bed or first few charges of iron. In small cupolas limestone is generally charged with the second or third charge of iron. In large cupolas, when the charges of iron are light, six or eight charges, or generally about one-sixth of the heat, are charged without limestone. This is the way limestone is used when the cupola is run in the ordinary way for a few hours. When the cupola is run for some special work the limestone is charged in a number of different ways.

The slag is drawn from the cupola through an opening known as the slag hole. This opening is made through the casing and lining under the lower level of the tuyeres, and at a point in the cupola where it will be out of the way in removing iron from the spout and convenient for removing the slag. The hight the slag hole is placed above the sand bottom depends upon how the iron is drawn from the cupola. When it is desired to hold iron in a cupola until a sufficient quantity is melted to fill a large ladle the slag hole is placed high, and when the iron is drawn as fast as melted the slag hole is placed low.

When a slag hole is placed high slag can only be drawn as the cupola fills up with iron and raises it to the slag hole. When the iron is withdrawn from the cupola the slag falls, and the slag hole is closed with a bod to prevent the escape of the blast.

When the iron is withdrawn from a cupola as fast as melted the slag hole is placed low, and when opened it is permitted to remain open through the remainder of the heat. This is the best way of drawing slag from a cupola, for the flow of the slag is regulated by the amount of slag in the cupola, and if the

*Paper read by Dr. Edward Kirk at the October meeting of the Foundrymen's Association held in Philadelphia.

hole is not made too large there is no escape of blast. The slag in the bottom of a cupola takes up impurities from the fuel and iron, and if permitted to remain in the cupola for too long a time it may become so thick that it will not flow from the slag hole; or it may be filled with impurities, become overheated, boil up and fill the tuyeres with slag, and when boiling it will not flow from the cupola through a small slag hole. The time for drawing slag from a cupola is, therefore, a matter of great importance. The slag hole is generally opened in from half an hour to an hour after the cupola begins to melt, and when placed low is permitted to remain open through the remainder of the heat. When placed so high that slag can only be drawn when the cupola fills up with molten iron it should be opened as soon as the slag begins to rise and closed as soon as it falls below the opening.

Does it Pay to Slag a Cupola?—Nothing is gained by slagging a cupola when the sprues and gates are milled and the heat can be melted successfully in the cupola without slagging. But a great saving in labor and wear and tear of machinery can be effected in many foundries by melting the sprues and gates with the sand on, and slagging the cupola to carry the sand out and keep the cupola working free. A cupola cannot be made to melt iron faster by slagging than it can without slagging, but it can be kept in blast and in good melting condition for a greater length of time and a much larger amount of iron melted by slagging. Foundrymen who find their cupolas temporarily too small to melt the quantity of iron required for their work can overcome the difficulty by slagging the cupola and keeping it in blast for a greater length of time. In endeavoring to make an estimate of the cost of slagging a cupola I found that the cost of limestone in different localities varied from 50 cents to $3 per ton. The amount used varied from 25 to 100 pounds per ton of iron melted. The amount of slag drawn varied from 25 to 100 pounds of iron. The iron combined with the slag varied from 4 to 7 per cent. With the wide differences in the cost and quality of limestone used and the difference in the quantity of slag drawn and percentage of iron it contained, I found it impossible to make an estimate that would be of any practical value to foundrymen. Such an estimate must be made at each foundry to be of any practical value.

Oyster, clam and other shells are frequently used as a flux in place of limestone in localities where they can be procured at a less cost than limestone. The shells are charged in the same way as limestone and in about the same proportions to the iron. They may be used in place of limestone, either in large or small quantities, and have about the same effect upon the iron and cupola as limestone. When used in large quantities they produce a fluid slag that keeps the cupola working free and flows freely from the slag hole, carrying with it the refuse of melting that clogs a cupola.

Marble is another of the carbonates of lime and the spalls or chippings from marble quarries or works are quite extensively used in some localities as a cupola flux.

There are a number of other minerals such as fluorspar, feldspar, quartz rock and numerous chemical compounds that are used as cupola fluxes, but I will leave these for consideration at some future time.

The Baxter Stove Company

of Mansfield, Ohio, send us a pamphlet in a robin's-egg blue cover, with embossed design and gilt letters, which is the twenty sixth annual catalogue and devoted to the Baxter Banner stoves and Monarch vapor and gas stoves. This combination of coal, vapor and gas goods under one cover is a new departure with them, although they state that early in the season this catalogue will be supplemented by a special one of oil and vapor goods. The pamphlet contains 158 pages, the first being devoted to an illustrated title page, the pricipal feature of which is the Superb Banner, a handsome square parlor heater for 1893. Then follow portraits of the members of the company, an engraving of the plant and next their trade-mark. After the preface follows the line of goods, the Banner range taking the leading place, followed by the Pacific Banner, the new Grand Banner, which is shown by half-tone engravings; the Royal Banner and the Premium Banner range. The Majestic Banner is a brand new wood range, which is claimed to be first class in every particular and has all the Baxter specialties of balanced oven door, patent covers and centers, patent removable bottom oven plates, and is ornamented in the latest and most artistic design. The oven door has an extra large nickel panel with art tile and a ventilated oven door handle. An ornamental high shelf and white enamel reservoir are other features. The Majestic Banner cook has all the original features of the Majestic Banner range, and is also furnished with reservoir and low closet. The Favorite Banner is a new medium priced wood cook made with reservoir and with reservoir and closet. These are followed by the Welcome Banner, Windsor with elevated oven, and Success, completing the line of cook stoves shown. The Banner Franklin leads their line of heating goods, followed by the Brilliant Banner for coal or gas, materially improved for 1893. Of the Superb Banner, which occupies the central place in the engraving at the front, they say: "This is the most beautiful stove we make." These are followed by the Windsor Banner, Floral Banner and Model Banner heating goods, and the Genial Banner, which is an entirely new and beautiful parlor stove, mounted with a Russia finished steel jacket. A line of box and Todd wood stoves follows, the Banner High Shelf No. 1 being entirely new. These goods are followed by the Monarch gasoline ranges and cook stoves. Some are cabinet ranges and others rest on skeleton frames. Of the Monarch new method they say substantial improvements will be made, shown in their catalogue specially devoted to these goods, which will be issued later on. With reference to their Monarch gas stoves they state that they have made a special department in their factory equipped for the manufacture of these goods, recognizing that gas is to be the fuel of the future. Only a portion of the line of gas stoves is shown here.

ODD PLATES.

The Majestic Mfg. Company, St. Louis, Mo., are enjoying a heavy run of orders for their steel plate and malleable iron family ranges and have been compelled to increase their manufacturing facilities accordingly. They are at present turning out 54 complete ranges daily, and find these not sufficient to meet the demands of the trade. The increase in the manufacturing facilities will enable them to increase their output 25 per cent.

Among recently authorized corporations in Illinois, a license has been granted to the Converse Heating Company, at Chicago, capital stock $10,000, to manufacture and deal in heating apparatus and appliances, cooking and culinary utensils; incorporators, Lyman P. Converse, George K. Harrington and W. P. Craig.

Walker & Kepler of 531 Chestnut street, Philadelphia, the general agents of the Carpenter Electric Heating Mfg. Company, have issued an illustrated 16 page catalogue under the title "Cooking and Heating by Electricity." The catalogue covers a line of cooking utensils having electricity applied directly to each article. The line covers coffee and tea pots, stew pans, tea kettles, broilers and toasters, chafing dishes, pancake griddles, skillets, baking ovens and disk heaters. The different articles are well illustrated, and illustrations are also given of electrically heated curling tongs, heaters, sad and polishing irons, hat irons, goose irons, glue pots and sealing wax heaters. The latter pages of the catalogue are devoted to a house and office radiator and an atmospheric heater. The goods are all described as being adapted for use on any electric light wire in domestic use.

Robert Campbell, the New York agent of the Abram Cox Stove Company of Philadelphia, is making some substantial improvements to his showroom at 305 Pearl street. A fine exhibit is made of the Novelty line of hot air furnaces.

The death of G. G. Hallett, at his residence in New York, removes a man who was well known to the stove trade throughout the country.

The Michigan Stove Company are furnishing their customers with neat water proof signs, which are to be tacked in conspicuous places "around town." These signs have a bright blue ground, while the lettering stands out in white. The company's trade-mark is a conspicuous part of the sign.

The Union Stove Works, 70 Beekman street, New York, announce to the trade by a circular that they have just added to their extensive line of Commander furnaces a new No. 54 portable, with new steel or cast iron radiator and slicing, shaking and draw center grate. The No. 54 is designed for heating large buildings which require a hot air furnace of more than ordinary power. It can be furnished when necessary with legs to raise it 4 inches above the floor, in order that the air supply may be taken from the room in which it is set. They give the grate surface as 25 inches in diameter and the fire surface as 29½ inches, and claim for it a heating capacity of 12 to 14 rooms, or about 70,000 cubic feet.

Henry N. Clark, 103 105 Blackstone street, Boston, Mass., favors us with a copy of the catalogue which he has issued relative to stove, range and furnace repairs. Attention is also directed to stove dealers' supplies of all kinds, as well as to price-lists of hollow ware, sinks and other goods likely to interest the trade. The catalogue is made up of 176 pages, of which something over 60 are devoted to lists of stoves for which repairs can be supplied. In offering this catalogue to the trade Mr. Clark directs special attention to the large and extensive variety of repairs,

(Continued on Page 63.)

TRADE REPORT.

The Iron Market.

The certainty that the purchasing clause of the Sherman bill will be repealed unconditionally has revived hope, and is received with satisfaction. Some authorities in the Iron trade expect an increased volume of orders and a more cheerful tone. Others believe that repeal now has simply saved us from additional disasters. It is probable that a good effect may be produced in another direction. There is evidence that during the protracted period of doubt over the fate of the silver question sales of Steel were made at very low prices for delivery very far into next year. Now that this danger is over a more conservative course may be followed.

Another question will come to the front which is expected to influence adversely developments in the Iron trade. There are many clear headed men engaged in the business who are convinced that nothing so radical in the way of tariff revision will be formulated by Congress that it will hurt the industry. A large majority of earnest and sincere persons, however, do believe that any change in the present rates of duty will do quick and lasting harm. Until it is known what those changes are to be their effect cannot be measured.

This broad statement may be made, so far as this winter's business is concerned, that no cut in rates likely to be passed will enable a buyer to purchase at lower prices than those now prevailing through the influence of fierce domestic competition at a time of unparalleled depression. As for the reflex action upon the Iron trade of disastrous effects upon other national industries, the case may be entirely different. It is remote, however, and should not affect perceptibly business which is pending or must come out for early settlement.

A little more work has come out lately in many directions, but it is far from being enough to put even a semblance of backbone into sellers.

Pig Iron.—In the New York market buyers are taking Iron only for immediate requirements, and the market continues very dull. We quote Northern brands $14 @ $15 for No. 1; $13 @ $14.25 for No. 2, at tidewater. Southern Iron, same delivery, $13.25 @ $14.25 for No. 1; $12.25 @ $13.25 for No. 2; $11.50 @ $12.25 for No. 3; $11.75 @ $12.25 for No. 2 Soft, and $12.25 @ $12.50 for No. 1 Soft.

The Philadelphia market is described as dull, listless and apathetic. Consumers appear to be absolutely indifferent in regard to the future course of the market. All they care to do is to provide for current requirements, leaving the future to take care of itself. Consequently, sellers find it impossible to make much headway on such a market, and are therefore taking such business as they can get at current quotations, or as near to it as may be. This in the aggregate is very trifling compared with any similar period during the past three or four years, notwithstanding the fact that prices are at the lowest ever known. Sales are mostly at about the following quotations for Philadelphia or nearby deliveries, with occasional sales of round lots at 25¢ @ 50¢ less money: $13 @ $13.50, delivered, for No. 2 Foundry, and $14 @ $14.50 for No. 1. Southern Irons can be had at less money, several lots having changed hands at $11.50 @ $11.75, with a fair chance that orders could be placed at the same figures for good sized lots and prompt settlements.

The business of the past week in the Chicago Pig Iron market has been of an irregular character. Some houses have been so fortunate as to capture a few good orders. One of these was for 1000 tons of local Coke and another for 500 tons. Business, however, generally has been confined to carload orders, and even these have by no means been numerous. Quotations are as follows, for cash:

Lake Superior Charcoal	$16.00 @	$16.50
Local Coke Foundry, No. 1	13.50 @	14.00
Local Coke Foundry, No. 2	12.75 @	13.00
Local Coke Foundry, No. 3	12.25 @	12.75
Local Scotch	14.00 @	14.50
Ohio Strong Softeners No. 1	15.50 @	16.00
Southern Silvery, No. 1	@	14.50
Southern Silvery, No. 2	@	14.00
Southern Coke, No. 2	12.10 @	12.60
Southern Coke, No. 3	11 6 @	11.85
Southern, No. 1, Soft	12.35 @	12.60
Southern, No. 2, Soft	11.85 @	12.10
Tennessee Charcoal, No. 1	16.00 @	16.50
Alabama Car Wheel	18.50 @	18.75
Hocking Valley, No. 1	15 25 @	16.00
Jackson County Silvery	16.00 @	17.00

There has been no change in the condition of Pig Iron in the Pittsburgh district since our last report. Some Iron is being sold right along, but in small lots ranging from 100 to 500 tons. If the present degree of activity among the mills is maintained, and there is no increase in production of Iron, it is not improbable that consumption may catch up with production within a short time, and when this has been attained there will undoubtedly be a better outlook for the Pig Iron trade. We repeat quotations of last week, as follows:

No. 1 Foundry	$12.50 @	$13.00,	cash
No. 2 Foundry	11.50 @	12.00	"

Southern Pig Iron markets show no improvement. There has been little more than a current jobbing demand in this district, running from single carloads up to 200 tons for immediate shipment, but no buying for forward delivery, although the indications are that Pig Iron could be obtained at the rates now current for any delivery during the next four months. The occasional offering of some calamity Iron at prices less than the cost of production, although not in first hands, tends to keep up the demoralization of the market and to prevent any recuperation. While the offerings of Southern Iron are not large or urgent, it is not difficult to obtain a sufficient quantity to meet the requirements of the market, for the demand from the East is smaller than it has been. There is scarcely any demand for Charcoal Iron. Quotations are as follows:

Southern Coke, No. 1	$12.75 @	$13.00
Southern Coke No. 2	10.75 @	11.00
Southern Coke No. 3	10.25 @	10.50
Ohio Soft Stone Coal, No. 1	15.50 @	16.00
Ohio Soft Stone Coal, No. 2	14.50 @	14.75
Lake Superior Coke No. 1	15.00 @	15.25
Lake Superior Coke No. 2	14.00 @	14.25
Hanging Rock Charcoal, No. 1	18.50 @	19.00
Hanging Rock Charcoal, No. 2	17.50 @	18.00
Tennessee Charcoal, No. 1	14.00 @	14.25
Tennessee Charcoal, No. 2	13.00 @	13.25
Standard Southern Car Wheel	17.75 @	18.00
Lake Superior Car Wheel and Malleable	17.00 @	17.25

Metal Market.

Pig Tin.—As far as recorded, the speculative dealings have been on a moderate scale and sentiment in the speculative direction seems to be exceedingly tame. Thus far this month less than 100 tons of Tin have been imported. According to most calculations nearly or quite 1000 tons have been turned out from first hands. The statistical position would thus appear to have undergone a further change for the better. It is the plain fact, however, that prices have averaged a shade lower, and that the movement of prices is rather inconsistent with the apparent relation of supply and demand, making altogether a peculiar market. Prices for deliveries this month and next have receded to 20 75¢ and December delivery commands little, if anything, more than 0.10¢ premium, despite estimates of a reduction of at least 1500 tons in spot stocks during the next six weeks. The best bids at the close for current and next month delivery were 20.70¢. There were sellers at 20.75¢ for October and 20.80¢ for November delivery at the close, with jobbing quantities offered at corresponding rates. The demand from consumers is fair, and jobbers' prices for small lots remain unchanged.

Copper.—Nothing has transpired in the way of new export or home trade movement that reflects any decided

change in the condition of the market. Certain it is that fresh purchases have been on a moderate scale and that buyers are extremely indifferent, since deliveries on old contracts satisfy current wants to no small extent, while the offering affords something more than purely circumstantial evidence that the supply keeps fully abreast with the demand. A good showing is made in export statistics and the foreign markets have stiffened somewhat in the face of that fact, but Copper can be purchased as cheaply at present as at any previous time this month. Thus 9¾¢ has become a common selling price for Lake Superior Ingot, while business is said to have been effected *sub rosa* at 9 70¢, regular terms, and at even less net cash terms, prompt shipment; about 250,000 lb were sold. With other varieties the experience has been somewhat similar, Electrolytic selling at 9¼¢ @ 9⅜¢ and common casting stock at 9⅛¢ @ 9¼¢, according to brand. The current demand embraces little beyond quantities needed for present requirements. Jobbers' orders are reported as moderate in size, but recent inquiries show that more interest is being taken in Ingot Copper than has been the case of late months. Retail prices for small quantities are mentioned generally at the level of former quotations.

Sheet Copper.—A rather more active movement is noted in the demand for Cornice Copper, some comparatively good sized orders having been placed during the past week. Inquiries have also increased in number, and it is believed that, with any reasonable encouragement, a good business may develop before the end of the year, as many shops are now in shape and waiting for material from which to work up their spring goods. Stocks in the hands of consumers are very small indeed, but they would, it is thought, be generally replenished with any lifting of the present dullness in trade.

Pig Lead.—Nearly if not quite 1500 tons of common domestic have been sold at 3.30¢, delivered here or at common point during the balance of the year. The greater portion was taken by consumers, and not a little went from a prominent firm that purchased 1000 tons or more some time ago when values seemed to have been at a low ebb. Reports have had circulation that mining operations were checked to a greater or less extent by water difficulties; but latest accounts go to show that Idaho and other producers having modern machinery more than hold their own, and that several are in a position to work profitably at present prices, or, say, 3¢ @ 3.05¢ in East St. Louis. Bids for substantial sized lots were raised late in the week to 3.35¢, at which price 100 tons were sold for cash and prompt shipment. The retail consumptive demand is of a very restricted character. Jobbers' prices for small lots of American Pig are quoted at 4⅛¢ @ 4¼¢ ℔ lb.

Lead Pipe and Sheet.—Manufactured Lead continues in very slow sale. New York prices for Pipe and Sheet, although unchanged, per list, are inclined to weaken in face of the poor demand now existing.

Spelter.—There are faint signs that the market for this metal has reached hard pan. The most conspicuous of these is the fact that there are numerous orders for certain Western brands at 3.50¢, delivered here, for export account. It is learned also that the product of several smelters for the balance of the year has been sold up, and that bids of 3.55¢ have been refused in more instances than one. Any price under 3.60¢ for other than inferior brands seems to be exceptional at the moment, and there is not a great deal offered at that. Prices for small quantities of Western Spelter rule about 1¢ in advance of the wholesale rate. Retail quotations are given at 4¼¢ @ 4⅜¢.

Tin Plates.—Coke Plates have continued to be the most active stocks in the market, although sales in this line have fallen off somewhat, as compared with those of the past few weeks. Prices for both spot stocks and future deliveries have weakened slightly from those established a week ago. The season for canners' orders is now approaching a close, and their requirements have been generally filled; consequently the activity in Cokes will naturally abate. The market for Bright Charcoal and Terne Plates shows a fitful and irregular movement, although some jobbers speak of receiving a very fair volume of orders of moderate dimensions from day to day. The truth is that stocks in the hands of consumers and the smaller retailers are of the narrowest description, and their current needs create a moderate demand in the retail market, which serves to keep it from anything approaching stagnation. A prominent Tin Plate merchant of New York, who has recently returned from a Western tour, mentions an absolute lack of any stocks of Plates in the various localities visited by him. Purchasers, he says, expressed their intention of buying nothing in that line beyond what they require from week to week, until they have some assurance of the course of currency and tariff legislation. The same reasons militate against the business of wholesale merchants and importers of Tin Plates. Shipments from the other side are very light, and interest in futures continues small, nor, in the opinion of authorities in the trade, is any material revival likely to take place until the future of the tariff on Tin Plates is settled. General prices show no radical change from last week.

Sheet Iron.—Galvanized Sheets continue in good demand, and as no material increase in the output of this material has taken place or is in prospect, a scarcity of Galvanized Iron is being felt in some quarters. The mills now in operation have no stocks on hand and are generally a week or so behind their orders. The complaint is made by producers that at the current prices there is little or no profit in the manufacture of Galvanized Sheets, and unless better rates can be obtained no encouragement exists for any of the idle mills to start up again. Indeed, it is freely mentioned in the trade that it pays many manufacturers better to let their machinery stand idle, for at the present price of labor running expenses narrowly approach, if they do not entirely swallow up, receipts. Some good inquiries have been noted for Galvanized Corrugated Iron for the export trade; but under existing circumstances little business in that line can be anticipated, all the efforts of manufacturers being devoted to filling domestic orders. Any considerable increase suddenly arising in the demand for Galvanized Sheets would find the mills in poor shape to satisfy it. The market for Black Iron is quiet; but mills are reported as busy, with but moderate stocks in hand, therefore there must be a fair business doing directly with the consumers.

Chicago Report.

Scrap.—Although trade cannot be called active, there is now some movement in all kinds of Old Material except Steel. Consumers generally are only buying to cover their daily wants, and will not anticipate the future. Dealers furnish the following list of buying prices, Chicago delivery:

	Per net ton.	Per lb
No. 1 Wrought Scrap	$8.00	....
Machinery Cast	7.00	....
Malleable Cast	6.00	....
Stove Plate (free of burnt)	5.00	....
Burnt Iron and Grate Bars	3.50	....
Sheet Iron and Hoops	2.00	....
Plow Steel and Breaking Stock	5.50	....
No. 2, such as Shovels, Hoes, &c	4.00	....
Old Boilers—whole (Iron)	4.00	....
" (Iron)—cut in single Sheets and Rings	6.00	....
Old Gas-Pipe and Boiler Tubes	5.00	....
Cast Borings	3 25	....
Turnings	4 00	....
Horseshoes	9.00	....
Copper Bottoms	....	5 ¢
Copper Clips and Heavy	....	7 ¢
Heavy Brass	....	5½¢
Light Brass	....	3½¢
Pipe Lead	....	2¼¢
Tea Lead	....	2 ¢
Zinc	....	2 ¢
Rubber	....	2¼¢

Anthracite.—Trade is very brisk, and the shortage of the local stock is decidedly marked. Carload lots of 12 net tons or over are quoted as follows:

	Grate.	Egg, Sto. and Ch.
Chicago, Ill	$5.85	$6.10
Milwaukee, Wis	5.85	6.10
Kansas City, Mo	9.05	9.30
Council Bluffs, Iowa	9.05	9.30
Lincoln, Neb	9.20	9.45
Sioux City, Iowa	9.05	9.30
Aberdeen, S. Dak	9.10	9.35
Dubuque, Iowa	7.15	7.40
Madison, Wis	7.35	7.60
St. Paul, Minn	8.35	8.60
Burlington, Iowa	7.35	7.60
Des Moines, Iowa	8.80	9.05
Davenport, Iowa	7.15	7.40

St. Joseph, Mo.	9.05	9.30
Leavenworth, Kan.	9.05	9.30
Omaha, Neb.	9.05	9.30

Colorado Anthracite.

COLORADO FUEL & IRON COMPANY.

Denver	$8.00
Pueblo	8.00
Colorado Springs	8.00
Leadville	8.00
Cheyenne, Wyo	10.00
All points between Denver and Missouri River	9.35

CONDITION OF THE

Hardware Trade.

ORDERS continue comparatively small and cover in most cases assortments simply for the replenishing of stock, seasonable goods having also a prominent place. Anticipating a quiet trade for the next two or three months, the large wholesale houses are buying very sparingly, preferring to let their stocks become considerably depleted rather than be obliged to carry over a considerable quantity of goods. They are also giving continued attention to the matter of credits, and are exceedingly careful in this regard, and disposed to restrict the time which accounts are permitted to run, limiting the transactions largely to a cash basis. In order to dispose of the stock on hand there is also a tendency on the jobbers' part toward cut prices on a good many lines, and more or less irregularity is thus caused. Prices, however, are pretty well maintained, and while there are cases in which manufacturers would undoubtedly accept lower prices on attractive orders, there has been on the whole a remarkable steadiness in values. Collections are unquestionably better, but a good deal of complaint is still made on this score. There is no reason to doubt that business during the past month or two has been seriously injured by the delay in the repeal of the Sherman bill, but it is expected that early action in this direction will have a beneficial effect on the general condition of trade.

Advices from Chicago.—The Shelf Hardware trade is in about the same condition as reported last week. The volume of business shows a decided falling off from its condition during the first half of October. Merchants throughout the Northwest have evidently filled up on season goods, and orders now coming in are only for small lots of Hardware, merely to cover present requirements. Stocks are reported by salesmen to be extremely light in every direction, but merchants are still disinclined to buy anything more than they must get for their immediate trade. The outlook is quite discouraging for the jobbing trade here for the balance of the year. Economies are being instituted so as to reduce expenses as much as possible to correspond with the shrinkage in business. The prices on Hardware generally are remarkably steady considering the circumstances. Tin and Tinware are especially noticeable in this respect, which is perhaps due to everybody carrying very light stocks. Heavy Hardware is in a somewhat better condition than Shelf Hardware, owing to the continued good trade in the iron and steel departments. The other departments, however, are quiet, as wagon and carriage makers are still buying very lightly.

Notes on Prices.

Wire Nails.—The volume of business is rather light, and comparatively few of the mills are running on full time. There have been some inquiries in regard to quotations on especially large lots, and it is understood that low figures have thus been developed. The market on the whole is represented by $1.30 for carload lots at mill, this figure being readily obtainable, though some manufacturers quote a slightly higher price.

Advices from Chicago.—The trade in Wire Nails tapered off during the past week, the early part having been fairly active, but it has as yet not relapsed into complete stagnation, as there are some inquiries from large buyers for considerable quantities which are expected to lead to further business. Prices have receded on factory lots and some sales were made as low as $1.32½, Chicago, although $1.35 to $1.40 are now considered fair quotations. Jobbers have recently had an improved business in Wire Nails and have taken a great many orders, but usually for small quantities. Their regular price from stock is $1.50, but this is shaded by some houses.

Cut Nails.—There has been little change in the Cut Nail market since our last review. The quotation of $1 base is regularly and quite firmly adhered to. There is evidence of a disposition on the part of the mills to obtain a slight advance, but it is not attended with much success. The volume of business is not sufficient to justify the running of the mills to their full capacity, and at the present time considerably less than the usual quantity of Nails are being made in the Wheeling district, and the Eastern mills seem to be doing a somewhat larger proportion of the business than usual. The New York price for small lots from store is $1.20 to $1.30.

Advices from Chicago.—The trade in Cut Steel Nails has been for some time moving in spurts, being fairly active for a few days and followed by a period of dullness. The net result, however, is such as to keep the local factories steadily at work. A change has recently been noted in the character of this trade which seems to have some significance. A great deal more business is now being done in Finishing, Casing and Clinch Nails, which was a branch of the trade that for a considerable period seemed to have been completely monopolized by Wire Nails. The Cut Nail manufacturers are hoping that this may prove that a reaction has taken place, but would like to see some further demonstrations before allowing themselves to derive very much encouragement. Prices are maintained at $1.20 to $1.25, Chicago, for factory lots. Small lots from stock are held at $1.30.

Barb Wire.—The Barb Wire market is stagnant and in an unsettled condition. Prices are decidedly in buyers' favor, and with the small volume of business doing are uneven and irregular. We quote Galvanized Four-Point at mill on a basis of $2.25 to $2.30. Painted being held at 40 cents less, but concessions from these figures are obtainable.

Advices from Chicago.—Manufacturers report only a moderate trade. This is derived in a large measure from direct connection with the retail merchants. It is difficult to obtain quotations as trade is now going, as prices made depend entirely on circumstances. Manufacturers of ordinary Galvanized Barb Wire are selling at $2.40, but this is shaded. Jobbers continue to quote small lots from stock at $2.55, but say that their trade in this line is practically dead.

Cream City Flour Bin and Sifter.—This article is put on the market by the Geuder & Paeschke Mfg. Company, Milwaukee, Wis., and was described in a recent issue. It is sold from the following list, which is subject to a discount of 50 per cent. to the trade:

25	50	100 pounds.
$34.00	$42.00	$54.00 per doz.

Automatic Steam Coffee Cooker.—This Cooker was described in our issue of October 14, and is put on the market by Wilmot Castle & Co., Rochester, N. Y. It is sold to the trade from the following list, which is subject to a discount of 40 per cent.:

2-qt. heavy tin,	$1.50	nickeled pots,	$2.00
3 " " "	1.75	" "	2 50
5 " " "	2.50	" "	3.50

Cereal Kettles for use in connection with the above steamers are sold at 20, 25 and 30 cents respectively.

The Arnold Automatic Steam Cooker, put on the market by the same concern, is sold to the trade from the following list, which is subject also to a discount of 40 per cent.:

No. 0, Two quarts,	1	compartment,	$1.50
No. 1, One gallon,	1	"	2.25
No. 2, Two gallons,	2	compartments,	2.75
No. 3, Three gallons,	2	"	3.50
No. 3, Three gallons,	3	"	3.75
No. 4, Four gallons,	3	"	4.50
No. 5, Five gallons,	3	"	5.00
No. 5, Five " oval,	3	"	6.00

Glass.—Since our last report the Glass market has been declared an open one by the National Window Glass Company; that is, the agreement among American manufacturers to sell Glass at only fixed prices has been abandoned. The Glass factories will start up when and as they please, so it will be a free

fight and no favor. The National Window Glass Company did not give up their charter, but for the present will not influence the manufacturers nor the trade. The wage question has not yet been definitely settled, but indications are that an agreement will be reached in a short time. It is estimated that 75 per cent. of the factories will be started up in the near future, but it remains to be seen how large a proportion of those starting can continue running, with light demand, accumulating stocks and low prices. Former quotations are still being adhered to, as no new Glass can be got on the market under three or four weeks, by which time the fall demand will practically be over. In Plate Glass there is little doing. Imported Glass is being sold in a small way, as the market continues lifeless.

Old Metals.—A very fair demand has sprung up for Scrap Iron, although values do not show any improvement so far. The market for Old Metals of other descriptions continues tame at unchanged prices. Quotations for New York delivery are about as follows:

Heavy Copper	₩ lb	6¾¢
Light and Tinned Copper	₩ lb	6¼¢
Heavy Brass	₩ lb	5¼¢
Light Brass	₩ lb	4½¢
Lead	₩ lb	3¢
Tea Lead	₩ lb	2½¢
Zinc	₩ lb	2½¢
No. 1 Pewter	₩ lb	14¢
No. 2 Pewter	₩ lb	6¢
Wrought Scrap Iron ₩ gross ton	$10.50 @	$11.50
Heavy Cast Scrap ₩ gross ton	11.00 @	12.00
Stove Plate Scrap ₩ gross ton	7.00 @	8.00
Burnt Iron (delivered at mill) ₩ gross ton	6.00 @	7.00

Old Rags, Paper, &c.—A rather better demand is noted for Paper stock, but prices remain at about the level of last week. Quotations in the New York market rule as follows:

No. 1 White Rags	₩ lb	3¼ @	3½
No. 2 White Rags	₩ lb	2¼ @	2½¢
Mixed Rags	₩ lb		3¼¢
Blues and 3ds	₩ lb	1 @	1¼¢
Hard Sized White Shavings	₩ lb		2¼¢
No. 1 White Book Shavings	₩ lb	2 @	2⅛¢
No. 2 White Book Shavings	₩ lb	1 @	1⅝¢
Light Book Shavings	₩ lb		¾¢
No. 1 Mixed Shavings	₩ lb		1¼¢
No. 2 Mixed Shavings	₩ lb		½¢
No. 1 Printed Books	₩ lb	1 @	1¼¢
Ordinary Mixed Books	₩ lb	½ @	¾¢
Newspapers	₩ lb		3-5¢
No. 1 Manila Paper	₩ lb	⅞ @	1 ¢
No. 2 Manila Paper	₩ lb	⅝ @	¾¢
Bogus Paper	₩ lb		½¢
Common Paper	₩ lb	⅝ @	½¢
Straw Chips	₩ lb	⅛ @	⅝¢
Binders' Clippings	₩ lb	½ @	⅝¢
Jute Butts	₩ lb	1¼ @	1⅜¢
No. 1 Jute Bagging	₩ lb		1 ¢
Mixed Bagging	₩ lb	¾ @	1 ¢
No. 2 Bagging	₩ lb	½ @	¾¢
Hemp Twine	₩ lb		2¼¢
Manila Rope	₩ lb		2½¢
Jute Rope	₩ lb	1½ @	1¾¢
Mixed Rope	₩ lb	¾ @	⅞¢

Old Rubber.—The market is featureless and dull. The following quotations represent approximately prices for New York delivery:

Car Springs, ton lots, ₩ lb.		@	$0.03¼
Rubber Shoes, carloads, delivered at factory, ₩ lb.		@	.03
Rubber shoes, less than carloads, ₩ lb	0.02¼	@	.03⅛
Large Hose, ₩ ton		@	9.00
White Wringer Rolls, ₩ lb.		@	.04¼
White Syringes, ₩ lb.		@	.05

Trade Notes.

A DEFECTIVE FLUE caused a fire in the tin and house furnishing store of R G Seaward, Petersburg, Va, on October 20. The loss incurred was about $2500.

THE AMERICAN SHEET IRON WORKS of Phillipsburg, N. J., will, it is said, resume operations this week. About 100 hands are employed at these works.

E. T. BARNUM, Wire works, of Detroit, Mich., has just received an award upon Steel Prison Jail Cells or Lockups and grocers' Cheese Safes, as well as upon his general exhibit at the World's Fair.

THE WORKS of F. E. Myers & Brother, Ashland, Ohio, manufacturers of Pumps of various kinds, are now in operation, with a larger capacity for production of Pumps than ever before. Some additions have recently been made to their equipment, among which is included a new 15 ton Colliau cupola in their foundry, and the refitting of the cleaning room with considerable modern machinery.

THE CAMBRIDGE IRON & STEEL COMPANY, Cambridge, Ohio, are operating three of their four sheet mills and are adding another pot to their galvanizing shop. This plant is equipped with the Bayliss patent pots manufactured by Davis & Co., Wolverhampton, England. It is claimed that this system effects a great saving of labor, as the sheets are carried automatically from the pickling vats through the metal pots to the shipping department. Another claim is perfect distribution of metal over the surface of the sheets, all parts being coated evenly. This department is under charge of Thos. E. Cook, formerly of Saginaw, Mich.

OPERATIONS at the large plant of the Ætna-Standard Iron & Steel Company, Bridgeport, Ohio, are now being conducted as follows: In the Ætna department all of the bar mills and two sheet mills are in operation. In the Standard department everything is on in full, including the galvanizing and corrugating departments. This leaves but four sheet mills in the Ætna department as the only idle parts of the plant. This firm announce that they are prepared to fill orders for their different lines of manufacture promptly, and expect to keep those portions of the plant now running in full operation.

THE CHAPMAN VALVE MFG. COMPANY of Boston, with works located at Indian Orchard, Mass., report a very busy season; not only have the works run to their fullest capacity with their full quota of employees, but the increasing demand has made it necessary to run many nights to keep abreast with the orders. The reason for this business activity during the general depression is owing to the fact that the demand has been for specialties that this company make. Since the increasing importance of using steam under high pressure, Jason Giles, the company's general manager, conceived the idea of making a gate valve with a removable bronze seat, which should be especially adapted for high steam pressure. Such a valve was made and patented by him March 18, 1890, and afterward assigned to the Chapman Valve Mfg. Company. About all of the largest electric light and power plants in this country are equipped with Chapman valves. Another specialty, the increasing demand for which has contributed to the company's activity during the present season is the indicator valve, which was also patented by Mr. Giles. The demand has been very large and from all sections of the country, and although the company have increased their capacity very largely this season in erecting a brick building 234 feet long by 50 feet wide, yet at this time every department is crowded to its utmost and still they are unable to keep up with the constantly increasing demand, and already have booked orders which will keep the present force of upward of 300 employees busy during the entire winter season and until spring trade opens.

AMONG THE NEW MANUFACTURING PLANTS recently completed in Brooklyn is that of Schlessinger, Weissner & Co., at Eighth street and Third avenue. It is a substantial six-story brick building 100 feet square, and well lighted. A foundry 40 x 60 feet is built close beside it. This plant was erected for the purpose of manufacturing iron bedsteads and bent steel furniture. At the present time they are said to be busily engaged with orders.

GEO. A. OHL, Newark, N. J., has been making a visit to the World's Fair and is now visiting the trade on his way home, in the interest of his specialties in sheet metal working machinery.

JOHN DAVIES, Eleventh street and Second avenue, Brooklyn, N. Y., in making 983 castings for the Dale Tile Mfg. Company, consisting of frames and tiles, only lost two castings, or less than 600 pounds in a total of nearly 90 tons. This is an exceptional experience in foundry practice.

F. A. KLAINE & Co., Cincinnati, whose advertisement appears elsewhere, call attention to the fact that the Omaha and Chancellor Cook Stoves, patterns of which have been recently purchased from the Chamberlain Stove Company, have now been on the market for upward of 49 years, which is a phenomenal record.

THE QUINCY ELBOW MFG COMPANY of Quincy, Ill., send us a little pamphlet of pocket size, in which attention is directed to the Monarch elbows which they manufacture. The merits of these goods are set forth in an entertaining style, illustrations of a more or less humorous character being scattered through the pages. The front cover represents an interior view, showing the usual experience of a man who attempts to put up or take down a stove pipe without the use of the Monarch elbow, while the fourth page of the cover is embellished with a view of another interior, in which the "brownies" are connecting a kitchen range with the chimney by means of joints of pipes and Monarch elbows. The two pictures speak for themselves and very effectively make the point which the manufacturers intend.

E. T. BARNUM, Detroit, Mich.: Wire and Iron good. Catalogue No. 570, 120 pages, is accompanied by a discount sheet and illustrates with prices and descriptions a very comprehensive line of goods. It is remarked in an introduction that the book has been compiled with the view of showing a general line of the Wire and Iron goods manufactured, and while very complete, it embraces a class of goods covering so large a field that it is possible to illustrate but a comparatively few designs of the different lines.

C. M. MCCLUNG & Co., Knoxville, Tenn. Hardware, Stoves and Tinware. Their Stove catalogue No. 4 illustrates,

with prices, Ranges, Cook Stoves, Heating Stoves, Laundry, Parlor Lamp Stove, Grates, Hollow Ware, Stove Trimmings, Fire Sets, Stove Boards, Coal Vases, Iron Roofing, Freezers, Coolers, Wooden Ware, Galvanized Iron Ware, Tinware, Japanned Ware, Agate Ware, Cane Mills, Evaporators, &c.

THE SEDGWICK BROS COMPANY, Richmond, Ind.: Wire Netting, Fences and Gates, Sedgwick's Wire Stretcher, Summer Houses, Lawn Furniture, &c. Their catalogue contains illustrations, descriptions and prices of Stretcher, Farm Fencing, Lawn Fencing, Pickets, Gates, Netting, Self Opening Gate, Fencing for cemetery lots, &c.

LEGGETT & BROTHER, New York: Questions Answered, and Hints on Home Decoration, an illustrated pamphlet devoted to descriptions of and an explanation of the manner of using the firm's Varnish Stains, Enamels, Floor Paints, Gold Paint, Bath Enamel, Glass Paints, Varnishes, Liquid White Glue, Liquid Polish and Furniture Polish. The pamphlet contains no prices, and is designed to go into the hands of consumers.

The Breitting Metal Ware Mfg. Co.

The Breitting Metal Ware Mfg. Company, corner Huron and Sedgwick streets, Chicago, have recently erected their own factory and have largely increased their manufacturing facilities by the introduction of new and improved machinery. They are, therefore, better prepared than ever to meet the requirements of the trade. The goods they manufacture comprise hot water and coffee urns, cuspidors, scoops and bar specialties, to which they have just added Browne's lamp heating stove, a new construction, patented May 30, 1893. Charles Breitting, manager of the company, devotes his entire attention to the manufacturing department. Having had 25 years' experience in the production of metal goods, his connection with the company insures good workmanship and reliability. Adolph Hartmann is president and Gustav Stieglitz is secretary. A handsomely illustrated catalogue has just been issued describing the Excelsior, Lilly, Tally-Ho, Columbia and Mikado hot water urns. The Columbia has an extra tumbler warmer round the urn. These urns can be fitted with the company's automatic arrangement by which only a pint of water is heated at a time, almost instantaneously, and when drawn off a fresh supply of water enters, thus avoiding the heating of several gallons of water in bulk, which requires considerable time. The Champion tea and coffee urn is a new urn, just brought out this year, for the use of hotels, dining rooms, coffee houses, &c. The coffee and milk jars of this urn are of cast iron, porcelain lined, and also porcelain covered on the outside, so that no metal is brought in direct contact with coffee or milk. The bottoms are arranged to completely drain the jars. There are numerous other good features about this urn, and it is stated that the coffee made in it will retain its aroma and flavor 24 hours without deterioration. The company claim to be the only manufacturers of such goods in Chicago. Other articles illustrated are the Alaska water cooler, of heavy brass, with galvanized iron reservoirs, wine coolers, lemonade shakers, bottle caps, soda water glass holders, twine boxes, trays, &c.; also a hot water bed warmer, nickel plated, which retains heat for 12 hours.

Stove Trade Notes.

(*Continued from page* 58.)

as well as stove dealers' supplies, and states that additions are constantly being made to the stock, so that it is impossible to publish a list which will be complete for any length of time. For the purpose of facilitating the ordering of repairs a diagram is given showing the different parts of a range with their correct names. In the arrangement of the matter the name of the stove is first given, following which is that of the manufacturer. The catalogue is neatly bound in stiff paper covers, embellished with a gilt side title.

A 12 PAGE CIRCULAR, dated October, 1893, comes from the Wrought Iron Range Company of St. Louis, Mo., and Toronto, Canada, who are the sole manufacturers of the Home Comfort steel ranges and hot air furnaces. This circular treats of hotel and restaurant goods. The first two pages show the main plant at St. Louis and the branch factory in Canada. Farrell's patent steam oyster pans and the Manhattan oyster cooker are two articles shown for restaurant use, followed by gas waffle stoves, saloon lunch tables, an oyster steamer and cooker, Home Comfort urn. Another page shows the mammoth Home Comfort steel hotel range. Round steam roasting ovens for roasting meats, soup stock pots, both round and square, are noted, and the last page is devoted to enumerating an extensive and varied line of hotel kitchen utensils.

EDWIN A. JACKSON & BROTHER, 50 Beekman street, New York, are sending to the trade some seasonable circulars, printed on yellow enameled paper, containing half tone engravings of fire sets, spark guards, fenders and lanterns of ornamental iron work. A second circular relates to andirons, spark guards, mantel protectors and the Jackson patent ash trap.

THE WILLIAM CLENDENNING CO., Montreal, have been incorporated to take over the business of Wm. Clendinneng & Sons, manufacturers of stoves, ranges, iron pipes, castings, &c.

H. R. CHAMBERS AND FRANK POWERS, traveling salesmen in the Eastern States for the Phillips & Clark Stove Company of Geneva and Troy, N. Y., left the latter city Tuesday afternoon for Chicago to visit the World's Columbian Exposition. All the office clerks and salesmen of the concern in both cities have been given the opportunity to visit the fair at the expense of the company.

AERONAUTICS is a new monthly publication which is the outgrowth of the recent International Conference on Aerial Navigation. It is published by the *American Engineer and Railroad Journal*, 47 Cedar street, New York, whose editor is the well known engineer, M. N. Forney. Those who believe in the future possibilities of flight will find it a useful aid in their study.

The New York and New Jersey Bridge bill was passed by the House last week, after amendment so as to require the expenditure of $1,000,000 per year after the first year, and that the work shall be completed within ten years. J. H. Swan of the Bridge Company, whose plan has been approved, is quoted as stating that almost all the railroads running into Jersey City have signed an agreement with his company to use one bridge and station, which will be built at Forty-second street, New York, between Broadway and Seventh avenue. The only great road that has not yet joined the agreement is the Pennsylvania, and its adhesion is promised when a guarantee of the actual building of the bridge and station is given.

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Metal and Miscellaneous Prices.

CHICAGO, OCTOBER 26, 1893.

Tin—
Straits pigs.....23¢

Imported Tin Plates—
Charcoal Plates.—Bright.

Guaranteed Plates command special prices, according to quality.

		Per box.
Calland and Melyi Grade	IC, 10 x 14 @	$6.75
	IC, 12 x 12 @	6.75
	IC, 14 x 20 @	6.75
	IC, 20 x 28 @	13.50
	IX, 10 x 14 @	8.75
	IX, 12 x 12 @	8.75
	IX, 14 x 20 @	8.75
	IX, 20 x 28 @	17.50
	DC, 12½ x 17 @	6.50
	DX, 12½ x 17 @	8.50
Allaway Grade,	IC, 10 x 14 @	6.50
"	IC, 12 x 12 @	6.50
"	IC, 14 x 20 @	6.50
"	IC, 20 x 28 @	13.00
"	IX, 14 x 20 @	8.00
"	IX, 20 x 28 @	16.00

Coke Plates—Bright.

	Per box.
Steel Coke—IC, 10x14, 14x20.	$5.75 @$5.85
IC, 14x20, 90 lb	5.50 @ 5.60
IC, 14x20, 100 lb	@ 5.85
10 x 20	8.75 @ 9.00
20 x 28	11.50 @12.70
X, 10x14, 14 x 20	@ 7.35
B.V. Grade. IC, 10x14, 14x20.	5.85@ 6.00

Charcoal Plates.—Terne.

Guaranteed Plates command special prices, according to quality.

Mansel and Dean Grades.— IC, 14 x 20 ...@	$5.62½
20 x 28.....@	11.25
IX, 20 x 28.....@	14.25
Worcester Brand and equal.— IC, 14 x 20..	6.12½@ .....
IC, 20 x 28..	12.25 @ .....
IX, 14 x 20..	7.62½@ .....
20 x 28..	15.25 @ .....

American Tin Plates.
Charcoal Plates.—Bright.

Irondale, A. A.—IC, 14 x 20	$7.00
" " IX, 14 x 20	9.00
" " IXX, 14 x 20	11.00
" " IC, 20 x 28	14.00
" " IX, 20 x 28	18.00
" " IXX, 20 x 28	22 00
Florence.— IC, 10 x 14, 12 x 12, 14 x 20..	$6.75
IX, 10 x 14, 12 x 12, 14 x 20..	8.50
Palma.— IC, 10 x 14, 12 x 12, 14 x 20..	$7.25
IX, 10 x 14, 12 x 12, 14 x 20..	9.25

Each extra cross $2.00 and 20 x 28 double these prices.

Brilliant, Tissue Packed, IC, 14 x 20.	$9.25
Royal, extra, IC, 14 x 20	7.25
Merion, IC, 14 x 20	7.00
Almond, IC, 14 x 20	6.50
Mint, IC, 14 x 20	6.25

Coke Plates.—Bright.

Elwood.—IC, 14 x 20	$6.00
" IC, 20 x 28	12.50

Roofing Plates.

Arch, IC, 20 x 28	@$11.75
Crescent, IC, 20 x 28	@ 12.25
Crescent, IX, 20 x 28	@ 15.25
Empire, IC, 20 x 28	@12.50
Empire, IX, 20 x 28	@15.50
Hickory, IC, 20 x 28	@ 12.75
" IX, 20 x 28	@ 15.75
Alaska (heavily coated), IC, 20x28	@$14.50
Alaska IX, 20 x 28	@ 17.75
Special, IC, 20 x 28	@ 15.50
" IX, 20 x 28	@ 18.50
Merchant's Roofing (extra coated), IC, 20 x 28	@$17.75
Merchant's Roofing (extra coated), IX, 20 x 28	@$21.50
Merchant's Old Method, (extra heavily coated), IC, 20 x 28	@$19.75
Merchant's Old Method (extra heavily coated), IX, 20 x 28	$23.60
Irondale A: IC, 14 x 20	$6.25
IX, 14 x 20	7.75
IC, 20 x 28	12.50
IX, 20 x 28	15.50
Westmoreland: IC, 14 x 20	$6.25
IC, 20 x 28	12.50
Elwood: IC, 20 x 28	$12.00
Juno: IC, 14 x 20	$5.75
IC, 20 x 28	11.50
Illinois, Old Method: IC, 20 x 28	$17.00
E. L.: IC, 20 x 28	$12.50
Jessie: IC, 20 x 28	$12.00
Scott's Extra Coated, Stamped and Resquared, IC, 14 x 20	$9.50
Scott's Extra Coated, Stamped and Resquared, IX, 14 x 20	11.00
Scott's Extra Coated, Stamped and Resquared, IC, 20 x 28	19.00
Scott's Extra Coated, Stamped and Resquared, IX, 20 x 28	22.00
Neville, Stamped, IC, 14 x 20	6.25
" " IX, 14 x 20	7.50
" " IC, 20 x 28	12.50
" " IX, 20 x 28	15.00
Taylor's Old Style, IC, 14 x 20 (Stamped and Resquared)	$9.50
Taylor's Old Style, IC, 20 x 28 (Stamped and Resquared)	19.00
Taylor's Roofing, IC, 14 x 20 (Stamped and Resquared)	8.25
Taylor's Roofing, IC, 20 x 28 (Stamped and Resquared)	16.50
Columbia, IC, 14 x 20 (Stamped)	7.25
" IC, 20 x 28 (Stamped)	14.50
Maple, IC, 14 x 20 (Stamped)	6.75
" IC, 20 x 28 (Stamped)	13.50
Willow, IC, 14 x 20	6.50
" IC, 20 x 28	13.00
Knoxall, IC, 14 x 20	6.25
" IC, 20 x 28	12.50
Globe, IC, 14 x 20	6.00
" IC, 20 x 28	12.00
Miami, IC, 14 x 20	6.00
" IC, 20 x 28	12.00
" IX, 20 x 28	15.00
" (Redipped), IC, 20 x 28	17.00

Tin Boiler Plates.

	Per box of 100 sheets.	Per box of 112 sheets.
X, 14 x 28	$13.00	$13.00
XX, 14 x 28	14.50	14.50
X, 14 x 31	14.50	15.80
XX, 14 x 31	16.50	17.50

	Per box of 56 sheets.
X, 14 x 56	29.50 / 16.50
XX, 14 x 56	32.50 / 18.20
X, 14 x 60	31.50 / 17.65
XX, 14 x 60	35.50 / 20.90

Sheet Iron—
Black.

	Common American	Refined.
Nos. 10 to 16	₩ lb 2 6 10¢	3 2-10¢
17 to 20	₩ lb 2 7-10¢	3 3 10¢
21 to 24	₩ lb 2 8-10¢	3 4-10¢
25 and 26	₩ lb 2 9-10¢	3 5-10¢
27	₩ lb 3¢	3 6 10¢

Russia, Planished, &c.

Genuine Russia, all numbers....13¢ net.
Patent Planished....₩ lb A, 10½¢; B, 9½¢ dis. 5%
Craig's Polished Sheet Steel.....8½¢

Galvanized.

Juniata or first quality.....dis. 70&5%

Copper—
Ingot.

Lake.....11¾¢ @ 12¼¢
Casting Brands.....11¢ @ 11½¢

Sheet and Bolt.

Discount, 25%.

Copper Bottoms.

Discount, 25%.

Seamless Brass and Copper Tubes.

Base price, 17½¢, Chicago, with extras according to size.

Copper, Bronze and Gilding Tube, 3¢ ₩ lb additional.

Brazed Brass Tubing.
(To No. 20 inclusive.)

Add freight from New York to Chicago to these prices, or 50¢ ₩ 100 lb.

Above 5-16 inch to 3 inch inclu...	35¢
Plain, above 3 inch	45¢
Plain, 5-16 inch	45¢
Plain, ¼ inch	60¢
Plain, 3-16 inch	$1.00
Plain, ⅛ inch	$1.50
Fancy Tubing, Brass, to No. 20 incl	43¢ lb
Bronze Tubing, 3¢ ₩ lb more than Brass	

40 @ 45 %

Roll and Sheet Brass.

Discount, 35 @ 40%.

Slab Spelter—
Western Spelter.....5

Sheet Zinc—
600 lb casks.....5 ¢
300 lb casks.....5¼¢
Loose sheets.....5½¢

Lead—
Soft Pig Lead.....4¢
Bar.....4½¢
Pipe.....5½¢, dis. 10¢
Block Tin Pipe.....35¢
Sheet.....6¢, dis. 10%

Solder—
½&½.....13¢@13½¢
Extra Wiping.....11½¢

The prices of the many other qualities of Solder in the market indicated by private brands vary according to composition.

Antimony—
Cookson.....12¢@12½¢
Hallett's.....11¼¢@11½¢

Wrought-Iron Pipe—
List on following page.

1¼ and under, Plain	57½&10%
1¼ and under, Galv	52½&10%
1½ and over, Plain	67½&10%
1½ and over, Galv	60&10%
Boiler Tubes, list Oct. 24, 1892	65@67½%
Casing, list Nov. 16, 1892	52½%
Inserted Joints Casing, list Nov. 16, 1892	47½%
Steel Boiler Tubes	27½%
Cold Drawn Seamless Steel Tubing	50%

Cast-Iron Soil Pipe—
Cast-Iron Soil Pipe, Tarred; sizes 2 to 6 inches, inclusive.....dis 70&2½%
Other sizes.....dis 60%

Leader Pipes—

Abendroth's Galv. Spiral Riveted	60%
Austin's Corrugated	60%
Gordon & Gilbert's Corrugated	60%
Ritchie's (Galv. Iron only) Cor'd	60%
Ritchie's Spiral Lock Seam, Galv'd	55%
Austin's Spiral Ribbed Pipe	60%
Plain Adjustable Elbows	60%
James A. Miller Bros. (Galv'd Iron only) Corrugated	60%

Furnace Fittings—
Discount from Excelsior Steel Furnace Co.'s list.....50%

Steel Roofing—

Perfection	$3.75 square
Climax	$3.50 square
The Lloyd Spanish Tiling	$4.50 square

Metallic Shingles—

Cushman's	$1.25 square
Merchant & Co.'s Spanish Tiles: Copper, 14 oz	$36.00 square
Tin	$9.75@$14.25 square
Steel, painted	$9.00 square

Drain Pipe—
Discount from list.....50%

Paints Oils, &c.—

Deodorized Benzine	7½@8 ¢
Iron Paint, Bright Red	₩ lb, 2 ¢
" " Brown	₩ lb, 1½¢
" " Purple	₩ lb, 2½¢
" Ground in oil, B. Red	₩ lb, 6½¢
" Ground in oil, Red	₩ lb, 6½¢
" Ground in oil, Brown	₩ lb, 5½¢
" Ground in oil, Purple	₩ lb, 6 ¢
Linseed Oil, Boiled, in bbls	40¢
Linseed Oil, Raw, in bbls	37¢
Mineral Paints	2@4¢
Orange Mineral	10¾¢
Pure White Lead in Oil	6¾@7¼¢
Dry White Lead in bbls	6¼@6¾¢
Red Lead, American	7@7½¢
Red Venetian, English, dry	$1.65@$1.70
Red Venetian in oil; asst'd cans, 8½¢; kegs	7½¢
Sipe's Japan Oil, in bbls, ₩ gal	34¢
Spirits Turpentine, in bbls., ₩ gal.	31½¢
Asphaltum, Trinidad Refined, ₩ ton	$45
Tarred Felt, 1 Ply, ₩ 100 lb	$1.60
Tarred Felt, 2 Ply, ₩ roll 108 sq. feet	$1.25
Tarred Felt, 3 Ply, ₩ roll of 108 sq. feet	$1.70
Roofing Pitch, ₩ bbl. of 300 lb	$3.00

NEW YORK, OCTOBER 27, 1893.

The following quotations are for small lots.

Aluminum—
No. 2 Grade Metal, in ton lots, ₩ lb, $0.75
No 1 (guaranteed to be 98 % pure and over), in ton lots .....₩ lb .90
Lots less than 1 ton, 10¢ ₩ lb additional.

Antimony—
Cookson .....₩ lb, 11¢
Hallett's.....₩ lb, 10¼¢@10½¢

Brass—
Planished.....net
Roll and Sheet.....35@40%

Brass and Copper Tubes
Brazed Brass Tubing—
List May 20, 1889.

	Per lb.
Plain, to No. 20 inclusive, above 5-16 inch to 3 inch inclusive	$0.35
Plain, to No. 20, above 3 inch	45
Plain, 5-16 inch to No. 20	45
Plain, ¼ inch	60
Plain, 3-16 inch	1.00
Plain, ⅛ inch	1.50
Fancy Tubing to No. 20, inclu	43

35@40%

Copper and Bronze Tubing—
3¢ ₩ lb more than brass.

Bronze, Tobin—
Drawn Rods for Bolts, Forgings, &c

Over ¼ to 3½ inches inclusive....17¢ ₩ lb
Over 3½ to 5 inches inclusive.....18¢ ₩ lb

Piston Rods, Finished True, Smooth and Straight.

Over ¼ to 3½ inches inclusive....18¢ ₩ lb
Over 3½ to 5 inches inclusive.....19¢ ₩ lb

Clips—
Buffalo Damper: Nos. 1, $1.25; 2, 2.50 per doz.....40&10%

Conductors—
Corrugated. *Round or Square—*
Galvanized.....60%
Galvanized, Locked Joints.....60%
Tin.....60%

Spiral Riveted—
Galvanized.....50%

See also *Elbows and Shoes; Eave-Trough Miters; Strainers, Conductor.*

Conductor Strainers—See *Strainers, Conductor.*

Copper—
Bottoms, Pits and Flats....25@25&5%

Ingot.

Lake.....11¢
Ansonia Grade Arizona.....10½¢
Ansonia Grade Casting.....10¢

Planished......net

Sheet and Bolt.....25&25&5%

Tubes—See *Seamless Brass Tubes.*

Coppers, Soldering—
See *Irons, Soldering*, in Current Hardware Prices.

Damper Clips Buffalo—
See Clips, Buffalo Damper.

Eave Troughs—
Lap or Slip Joint, Galvanized.....60&10%
Lap or Slip Joint Terne.....60%

Eave-Trough Mitres—
Lap or Slip Joint.....list, net

Elbows—
Plain Adjustable—
Tin.....70%
Galvanized.....70%

Crimped Tubing—
Re-Tinned or Galvanized.....35%

Stove-Pipe—
Buffalo Four-Piece.
4¼ 5 5½ 6 7 inch,
$0.78 .87 .90 .99 1.20 per doz..20 %

Elbows and Shoes—
Flat Crimp.

Tin.....35%
Galvanized.....35%

Corrugated.
Flat Crimp.

Galvanized.....60%

Round or Square.

Tin.....60%
Galvanized.....60%

Iron, Sheet—
Black.

	Common American.	R. G. Cleaned American.
Nos. 10 to 16	₩ lb, 2¾	3.10¢
Nos. 17 to 20	₩ lb, 2.85	3.10¢
Nos. 21 to 24	₩ lb, 2.90	3.20¢
Nos. 25 and 26	₩ lb, 3.05	3.30¢
No. 27	₩ lb, 3.15	3.40¢
No. 28	₩ lb, 3¼	3½¢
American B. B.	₩ lb, 4¢@4¼¢	

Russia, Planished, &c.

Genuine Russia, according to assortment.....₩ lb, 11¾@12½¢
Patent Planished....₩ lb, A, 10¢; B, 9¢, 5%
Craig Polished Sheet Steel.....₩ lb, 8½¢

Galvanized.

	B. B.
Nos. 10 to 16	70&2½%
Nos. 17 to 22	
Nos. 23 to 24	
Nos. 25 to 26	
No. 27	
No. 28	
Nos. 29 and 30	

Filter Joints—
Lee's.....33⅓

Lead—

American Pig	4¼¢@4¼¢
Bar	4½¢
Pipe	6¼¢, 20%
Tin Lined Pipe	15¢, 20%
Block Tin Pipe	37½¢, 20%
Sheet	7¢, 20%

Old Lead in exchange, 3½¢ ₩ lb.

Metal, Expanded—
Manufacturers' list No. 5.

Lathing	10%
Fencing, Painted Sheets	20%
Netting, Painted Sheets	20%
Door Mats, Galvanized	25%
Window Guards, Paneled	15%
Tree Guards, Paneled	15%

Mitres Eave-Trough—See *Eave-Trough Mitres.*

Paints Oils &c.—

Lead, Amn. White, in oil	6¾ @ 7¼
Lead, Red, bbls. and ½ bbls	6½ @ 7
Lead, Red, kegs	6¾ @ 7
Ocher, American	1 @ 1½
Red, Venetian, American	1½ @ 2½

Linseed Oil:
Raw, ₩ gal..... @ .40
Boiled..... @ .43

Spirits Turpentine:
In bbls..... @ .32

Putty:
In barrels and ½ bbls..... .01¾ @ .01¾
In tubs..... .01¾ @ .01¾
In tin cans..... .01½ @ .02⅛
In bladders..... .01¾ @ .02¼

Roofing Material, &c.:
Asphaltum, Trinidad Refined, ₩ ton..... $30.00@$35.00
Asphaltum, Rock, ₩ ton..... $14.00
Coal Tar Felt, 1 Ply, ₩ ℔..... 2¢
Coal Tar Felt, 2 Ply, ₩ roll 108 sq. ft. $1.42¼
Coal Tar Felt, 3 Ply, ₩ roll 108 sq. ft. $1.85
Roofing Pitch, ₩ bbl..... $2.25

Pipe, Drain

..... 50%

Pipe and Fittings, Cast Iron Soil—

Cast-Iron Soil Pipe, Tarred, sizes 2 to 6 inches, inclusive..... 60@60&10%
Other sizes..... 55@55&10%
Cast-Iron Fittings, Tarred, sizes 2 to 6 inches..... 60@60&10%
Other sizes..... 55@55&10%

Pipe, Spiral—

Galvanized..... 60%
Tin..... 60%

Rock and Slag Wool—

	₩ ℔	₩ cub. foot.
Slag Wool, ordinary	1¼	16¢
Slag Wool, extra	2⅛	38½¢
Rock Wool, ordinary	2¼	27¢
Rock Wool, extra	7¼	43½¢

Rosin—

Common and Good—Strained,
Rosin, C. & D..... ₩ bbl. $1.27@$1.30
Rosin, E. & F..... ₩ bbl. $1.40@$1.55
Rosin, G. & H..... ₩ bbl. $1.70@$1.90
Rosin, I. & K..... ₩ bbl. $2.10@$2.75
Rosin, M. & N..... ₩ bbl $3.10@$3.95

Seamless Brass Tubes..net

Shoes and Elbows—See *Elbows and Shoes.*

Slate Roofing—

According to size, f.o.b. cars, Quarry Station.

Pennsylvania:
Best Bangor, ₩ sqr..... $3.25@$4.50
Pen Argyle, ₩ sqr..... 3.50@ 4.25
Peach Bottom, ₩ sqr..... 5.00@ 6.25
No. 1 Chapman, ₩ sqr..... 4.00@ 4.65
Lehigh Slates, ₩ sqr..... 3.00@ 4.50
Vermont:
Sea Green, ₩ sqr..... 2.70@ 3.20
Purple, ₩ sqr..... 3.50@ 4.50
Unfading Green, ₩ sqr..... 3.50@ 4.00
Red, ₩ sqr..... 9.75@12.00

Solder and Soldering Fluids—

Solder—

½ & ½ (Guaranteed)..... 13½@14½¢
No. 1..... 11½@12 ¢
Prices of Solder indicated by private brands vary according to composition.

Soldering Fluids—

Concentrated Soldering Flux.
f. o. b. New York.
In barrels, ₩ ℔..... 4¢
Smaller quantities, ₩ ℔..... 5¢

Gedney's Soldering Fluid.
In carboys or barrels, ₩ ℔..... 2¢
$1.50 for carboy or barrel; money refunded when returned.

Perfection Soldering Flux.
No charge for package.
8bls., about 500 ℔, ₩ ℔..... 3½¢
½ bbls., about 300 ℔, ₩ ℔..... 4¢
Kegs, about 110 ℔, ₩ ℔..... 4¢
75¢ extra for keg. 5% disc.
Kegs, about 55 ℔, ₩ ℔..... 4¢

Yager's Soldering Salts.
½-℔ bottles, each..... 30¢
Large quantities, per ℔..... 10¢

Spelter—

Western Spelter..... 4¼¢@4¾¢
Bertha..... 8¾¢@9¢

Spiral Pipe—See *Pipe, Spiral.*

Stove-Pipe Elbows—*See Elbows, Stove Pipe.*

Stove Polish—See *Polish, Stove.*

Stove Trucks—See *Trucks, Stove.*

Strainers Conductor—

Galvanized..... 60%

Tin, Pigs and Bars—

Banca, pigs, ₩ ℔..... 22½¢
Straits, pigs, ₩ ℔..... 22¢
Straits in bars, ₩ ℔..... 23¢

Tin Plates—

American Terne Plates—

Alaska (re-squared) IC, 14 x 20..... $7.00
Alderly, extra quality, IC, 14 x 20..6.37½
Allegheny, IC, 14 x 20..... 6.12
" IX, 14 x 20..... 6 38
Apollo Roofing, IC, 14 x 20..... 6.25
" " IX, 14 x 20..... 7.25
Bonus, Extra Coated, IC, 14 x 20... 6.75
" " " IX, 14 x 20.... 8.25
Buckeye, IC, 14 x 20..... 7.00
" IX, 14 x 20..... 8.25
Chicago, IC, 20 x 28..... 11.50
Central, IC, 14 x 20..... 5.37½
Climax, IC, 14 x 20..... 5.70
Columbia, IC, 14 x 20..... 7.00
Crescent, IC, 14 x 20..... 6.00
Dunlap's Double Dipped, IC, 14 x 20 8.25
" " IX, 14 x 20 9.50
" Domestic, IC, 20 x 28 ..... 12.00
" " IX, 20 x 28..... 15.00
Empire, IC, 14 x 20..... 6.12½
Extra Central, IC, 14 x 20..... 5.62½
First New York, IC, 14 x 20..... 5.75
First New Jersey, IC, 14 x 20..... 5.75
Flag, IC, 14 x 20..... 5.50
Fort Pitt, IC, 20 x 28..... 11.00
Globe, IC, 14 x 20..... 5.75
Hamilton's Best Redipped, IC, 14x20 9.25
" " " IX, 14x20 10.75
Hickory (Resquared), IC, 14 x 20. 6 37½
Juno, IC, 14 x 20..... 5.75
Kensington, IC, 14 x 20..... 6.75
" " IX, 14 x 20..... 8.00
Knoxall, IC, 14 x 20..... 6.00
Laufman's Apollo (Resquared), IC, 14 x 20..... 8.12
Laufman's Apollo (Resquared), IX, 14 x 20..... 9.37
Leominster, Extra Coated, IC, 14x20 7.75
Lion (Stamped), IC, 14 x 20..... 6.25
Lula, Best Charcoal, IC, 20 x 28 ...12.50
" " " IX, 20 x 28....16.00
Manhattan, IC, 14 x 20..... 7.00
Maple, IC, 14 x 20..... 6.50
Merchant's Old Method (Resquared), IC, 14 x 20..... 9.50
Merchant's Roofing (Resquared), IC, 14 x 20..... 8.50
McKinley, IC, 20 x 28..... 12.00
IX, 20 x 28..... 15.00
Neville, IC, 14 x 20..... 6.00
IX, 14 x 20..... 7.25
N. F. Old Style, IC, 14 x 20..... 7.50
" " " IX, 14 x 20..... 9.00
Old Colony, IC, 14 x 20..... 8.00
Optimus, Best Redipped, IC, 14 x 20 8.25
" " " IX, 14 x 20 9.50
Osceola, Hand Coated, IC, 14 x 20.. 8.25
" " " IX, 14 x 20 . 9.75
Palacio, IC, 14 x 20..... 5.55
Pennsylvania Old Method (Treble Coated), IC, 14 x 20..... 8.50
Phœnix, IC, 14 x 20..... 5.80
Scott's Extra Coated (Resquared), IC, 14 x 20..... 9.25
Scott's Extra Coated (Resquared), IX, 14 x 20..... 10.75
Taylor Old Style (Resquared), IC, 14 x 20..... 9.25
Taylor Roofing, IC, 14 x 20..... 8.00
Thomson's Puritan, IC, 14 x 20.....5.75
Tip Top, IC (Resquared), 14 x 20.... 6.62
" IX " 14 x 20.... 7.88
U. S. Monongahela, IC, 14 x 20..... 6.50
U. S. Redipped, IC, 14 x 20..... 9.25
Venux, IC, 14 x 20..... 5.60
Waldo Redipped, IC, 14 x 20..... 7.25
Westmoreland, IC, 14 x 20..... 6.25
Wilkinsburg Redipped, IC, 20 x 28.16.00
" " IX, 20 x 28.19.00
Willow, IC, 14 x 20..... 6.25

American Bright Plates—

Almond, IC, 14 x 20..... $6.25
Brilliant (Tissue Packed), IC, 14x20. 9.00
Climax, IC, 14 x 20..... 6.50
" IX, 14 x 20..... 8.00
Florence, IC, 14x20..... 6.75
Hazel, IC, 14x20..... 5.85
Linden, IC, 14x20..... 6.50
Merchant's Dipped, IC, 14x20..... 11.00
Merion, IC, 14x20..... 6.75
Mint, IC, 14x20..... 6.00
Palma Xtra, IC, 14x20..... 7.25
Phœnix, IC, 14x20..... 6.25
" IX, 14x20..... 7.75
Royal, Extra, IC, 14x20..... 7.00
U. S., IC, 14x20..... 7.25

Imported Terne Plates—

Charcoal.
Dean Grade.—IC, 14 x 20..... @$5.50
20 x 28..... @11.00
IX, 14 x 20..... @ 6.75
20 x 28..... @13.50
Abercarne Grade.—IC, 14 x 20..... @ 5.40
20 x 28..... @10.80
IX, 14 x 20...@ 6.62½
20 x 28..... @13.25

Imported Bright Plates—

Charcoal.
Duty: 2.2¢ ₩ ℔.
Melyn and Caland Grade. IC, 10 x 14..... @$6.50
" " IC, 12 x 12..... @ 6.75
" " IC, 14 x 20..... @ 6.50
" " IC, 20 x 28..... @13.00
" " IX, 10 x 14..... @ 8.50
" " IX, 12 x 12..... @ 8.75
" " IX, 14 x 20..... @ 8.50
" " IX, 20 x 28..... @17.00
" " DC, 12½ x 17..... @ 6.00
" " DX, 12½ x 17..... @ 8.00
Allaway Grade. IC, 10 x 14..... @ 6.00
" " IC, 12 x 12..... @ 6.25
" " IC, 14 x 20..... @ 6.00
" " IC, 20 x 28..... @12.00
" " IX, 10 x 14..... @ 7.50
" " IX, 12 x 12..... @ 7.75
" " IX, 14 x 20..... @ 7.50
" " IX, 20 x 28..... @15.00
" " DC, 12½ x 17..... @ 5.50
" " DX, 12½ x 17..... @ 7.00

Coke.
Steel Coke.—IC, 10x14, 14x20..... @$5.50
10x20..... @ 8.50
20x28.11.50@12.00
IX, 10x14, 14x20..... @ 6.75
B. V. Grade.—IC, 10x14, 14x20..... @ 5.55

Imported Boiler Plates.—

IXX, 14x26..(112 sheets)..... @$13.35
IXX, 14x28..(112 sheets)..... @ 14.50
IXX, 14x31..(112 sheets)..... @ 16 00

Tinning—Brass and Copper.....net

Tubing—

Tin..... 55%
Galvanized..... 55%

Brass and Copper.—

Standard List..... 35@40%

Troughs, Eave—See *Eave Troughs*

Trucks, Stove—

Improved Lock Frame, per doz....$15.00
Steel Lock Frame, per doz..... 12.00
Daisy Improved Pattern, ₩ doz..... 18.00

Zinc—

600 ℔ casks..... ₩ ℔ 5¾¢
Per ℔..... 6½

MANUFACTURING.

Hardware.

Landers, Frary & Clark, New Britain, Conn., are now running their cutlery works four days a week instead of three, but business in the other departments of the plant is duller, so that there is a shut down of three days per week.

The Hinkle & Gaither Mfg. Company, Laurel, Md., manufacturers of agricultural implements, have nearly completed repairs to their buildings, and have all their machinery ready for operation. They will employ at the start about 50 men.

The Penn Hardware Company, Reading, Pa., have resumed operations.

The Crystal Mica Company's plant, at Warren, N. H., which has been idle through the summer, has started up and is running on full time.

The G. S. Foos Company, Springfield, Ohio, have disposed of their business to John Spencer and George O. Leedle, late treasurer of the company, who will incorporate a new organization to assume control November 1, when the manufacture of all kinds of wringers, lawn mowers, &c., will be continued. Ample capital and increased modern facilities will be provided. Mr. Spencer is referred to as a thoroughly practical and experienced mechanic.

The Rock Island Plow Works, Rock Island, Ill., resumed operations on the 16th inst. after a two-months shut down. About 250 men, less than half the usual force, are employed. The company have made a reduction of 10 per cent. in wages, and have shortened the working day for the present, so that the men work eight instead of ten hours.

The new warehouse of the Hatch Cutlery Works, South Milwaukee, Wis., was damaged by fire a short time since to the extent of $300, a loss which is fully covered by insurance. The warehouse was used for storing grindstones and unfinished shears.

Foster Brothers' Knife Works, at Oswego Falls, N. Y., were slightly damaged by fire on the 17th inst. The fire is supposed to have originated from smoldering sparks in the emery room. The prompt action of the fire department prevented what might have been a serious conflagration. The works are again in running order.

The Seabury Gun Company have been incorporated, with a capital of $300,000. The company will manufacture arms of all descriptions in New York City. The incorporators are E. H. Litchfield, J. B. Grosvenor, H. Wallis and others.

The Scranton Axle Works, Scranton, Pa., have resumed operations after a brief suspension, which was rendered necessary in order to make needed repairs. Important improvements in the works are contemplated which will increase their output.

The Belmont Nail Works, Wheeling, W. Va., a part of the Wheeling Iron & Steel Company, started up on the 16th inst., after an idleness of five months and partial idleness of a year. They are giving employment to over 500 men.

The Gleeson Wire Cloth Mfg. Company have filed a certificate of incorporation in the Hudson County Clerk's office in Jersey City, N. J. The company propose to establish a factory at Harrison, N. J., for manufacturing wires of various patterns. The company will begin business with a capital of $15,000. The incorporators are John Martin Moore of Kearney, George F. Wilson, Martin Desmond and Thomas F. Bulger of Harrison, N. J., and Francis A. Harris of Waterbury, Conn.

During the summer months extensive improvements and additions were made to the wire nail factory of the New Castle Wire Nail Company, at New Castle, Pa., whereby the capacity has been considerably increased. The plant of this concern is now in full operation and is turning out an average of 3200 kegs of wire nails every day. Since the initial establishment of this plant at New Castle it has been found necessary to increase the capacity from time to time in order that the firm could turn out their product as fast as wanted by the trade, and at this time their nails are sold in every part of the United States where wire nails are used.

The Standard Wire Company, New Castle, Pa., manufacturers of wire mats, report an excellent demand for their goods, and are operating their works to full capacity. Although this concern have been established but a short time, they have already built up quite a large trade, and propose in a short time to take up the manufacture of tree guards and other wire goods. The firm recently made a shipment of two of their flexible wire mats which measured 47½ feet in length and 6 feet in width. They have also received in the last few days a third order for a mat of this size, and are making shipments of the smaller sizes right along.

The Standard Horse Shoe Company, South Wareham, Mass., for whom Leeds, Robinson & Co., 4 Liberty street, Boston, are general agents, report that all their machines are being run full time. Improvements are going on at their plant, and additional new machines will be installed as soon as received from the makers. Their shoes are made from old horseshoes, insuring quality, and John Wike is patentee of the machines used and superintendent of the works.

E. T. Barnum, wire works, of Detroit, Mich., has just received an award upon steel prison jail cells or lockups and grocers' cheese safes, as well as upon his general exhibit at the World's Fair.

Miscellaneous.

The Providence Steam Engine Company are building two additional engines, each of 1100 horse-power, for the Union Company (electric railway) of Providence. These will be coupled direct to the dynamos. This company have made provision for engines and boilers of 7000 horse-power.

The plant of the Indianapolis, Ind., Steel Roofing Company has been damaged $3000 by fire.

It is now thought that the Litchfield Car Works of Litchfield, Ill., which have been casting about for some time for a suitable location for a new plant, will settle at Memphis, Tenn.

The C. & C. Electric Company's branch office in Philadelphia is now at 633 Arch street, in that city.

LABOR EXCHANGE.

Notices under this heading of reasonable length are inserted free of charge. Only those relating to employment are admitted. Write distinctly on one side of paper only, and do not use postal cards.

HELP WANTED.

Two first-class SLATERS and one CORNICE MAKER. C Rabe, corner Ferry and Water streets, Hudson, N. Y. Oct. 28

NICKEL PLATER, for stove work exclusively, to do the plating and oversee the polishing; state experience, wages expected, and reference. "Ohio," Box 1028, office of *The Metal Worker*, 96-102 Reade street, New York City. Oct. 28

Two good, temperate, reliable men with some knowledge of plumbing, roofing, furnace work and jobbing; good wages; steady job for the winter. Tulley & Davis, Lowville, N. Y. Oct. 28

A man who is acquainted with the steam heating trade to act as SALESMAN for the Reversible radiator; something new; big thing for right party. Address for particulars, O A. Hayford, 50 Belmont avenue, Jersey City, N. J. Oct. 28

First class TINSMITH and GENERAL JOBBER; strictly sober; state wages wanted. E. Powers, Frankfort, Ky. Oct. 28

SALESMAN to carry as a side line specialty in hardware and house furnishings; commissions liberal J. C. Wood, 219 North Douglass street, Indianapolis, Ind. Oct. 28

By a representative hot air furnace manufacturing company located in central New York State, a young man to take sole charge of retail department in estimating and selling hot air furnaces in their city and suburbs; must have had experience and understand the duties of such a position; good salary position for the right man; prefer unmarried man; must give good reference as to habits; must be temperate. "W.," office of *The Metal Worker*, 96-102 Reade street, New York City. Oct. 28

A first-class man as SUPERINTENDENT of stove foundry employing 40 molders; give age, reference, &c. "G. N.," office of *The Metal Worker*, 96-102 Reade street, New York City Oct. 21

A good all round FURNACEMAN; also a young man as SHIPPER; one of some experience in stove or furnace business preferred. Call, 210 water street, New York City. Oct. 21

An experienced man to take charge of a stove foundry located near New York; all communications confidential. "Experienced Man," office of *The Metal Worker*, 96-102 Reade street, New York City. Oct. 21

Two good CORNICE MAKERS. Apply to T. W. Corbett, New Haven, Conn. Oct. 21

Experienced man to solicit orders for castings for gray iron foundry doing job work exclusively; a good position for the right man. "Jobbing," office of *The Metal Worker*, 96-102 Reade street, New York. Oct. 21

SITUATIONS WANTED.

On or off the road, by a thoroughly experienced stove, range, tinware and house furnishing goods SALESMAN; 12 years' experience; good reference from former employers. J. B. Smith, care of Bridgeford & Co., Louisville, Ky. Oct. 28

By a first-class stove PATTERN MAKER who can do any fine pattern work; also fine designing; can take work home if necessary. O. A. Jensen, 779 South Washtenaw avenue, Chicago, Ill. Oct. 28

As PLUMBER, by young man, a graduate of the New York Trade School; has worked at trade one year; a good lead worker; best of references. "Plumber," Box 39, Moundsville, W. Va. Oct. 28

A middle-aged man would like a position as FOREMAN of stove foundry; I have had 20 years' experience as foreman, having handled from 50 to 100 men to good advantage; can furnish the very best references; will work for very reasonable salary. Jno. Ziegler, 139 Brown street, Dayton, Ohio. Oct. 28

By a TINSMITH and GENERAL JOBBER; good hand on roofing, ranges and furnaces; some knowledge of plumbing; city or country. "Tinsmith," care Mrs. Glener, 223 Christie street, New York. Oct. 28

To represent a factory or first-class jobbing house on the road in the West, by a thoroughly experienced nail, iron, steel, carriage and heavy hardware SALESMAN with over ten years' experience; wide acquaintance with factories and dealers from Mississippi River to Pacific Coast; unexceptional references; age 34. "W. S. B.," 76 Archer street, Denver, Col. Oct. 28

As TINSMITH and ROOFER. Herman Landasburg, 292 Delancey street, New York. Oct. 28

By a TINNER and CORNICE MAKER who can do general jobbing; some knowledge of plumbing. John J. Glass, Evansville, Ind, Oct. 28

I wish to obtain a position to travel for a good stove foundry; would make an immediate engagement, or for next year; my connection with the trade is well known and would enable me to do good work in New York, Pennsylvania, Ohio, New England or the South or elsewhere; over 20 years' in the trade. "A. J. S.," P. O. Box 126 Wickford, R. I. Oct. 28

By a METAL PATTERN MAKER who has worked in the best pattern shops in the country; can file and fit and do any kind of pattern work; an honest worker. J. M. Devore, 11 Delevan street, Auburn, N. Y. Oct. 28

By a first class SPINNER and IRON WORKER; 22 years' experience; can do wiring, beading and trimming. Charles Seider, 263 Floyd street, Brooklyn, N. Y. Oct. 28

By a WOOD and METAL PATTERN MAKER who is also a first-class wood turner and molder; can run almost any machine; generally handy. Madison Vorce, 15 Wood street, Auburn, N. Y. Oct. 28

As all around TINNER; have had 15 years' experience; can do all kinds of tin work inside and out of shop; am married man, sober and industrious; can come well recommended. H P. Powers, Auburn, Ind. Oct. 28

By a good all around TINNER in some country town; steady job preferred. C. R. Kramer, Avondale, Muncie, Ind. Oct. 28

As PLATER in general job shop or bicycle factory, by a man of 14 years' experience in polishing and plating departments; understands making and keeping silver, nickel and copper solutions, also brass and silver oxidizing; can furnish best of references. H. L. Church, 159 West Washington street, Indianapolis, Ind. Oct. 28

I would like to correspond with good reliable parties who are desirous of being represented in tin plate and plumbing supplies in New York, Pennsylvania or New England States on salary or commission and expenses. Box 85, Richburg, N. Y. Oct. 28

As TINNER or HARDWARE CLERK; can do anything in the tinware line; strictly temperate and steady. P. O. Box 134, Akron, Ohio. Oct. 28

By TINNER, with 15 years' experience at tin and sheet iron work; also understands iron piping, and has a fair knowledge of plumbing; strictly temperate; can give first-class references. L. H. Hall, Bolivar, N. Y. Oct. 28

By FOREMAN PATTERN MAKER; ten years in above capacity with large Eastern firm; 35 years old; sober, industrious and know how to handle men; first-class references. "D.," 229, *Post-Dispatch*, St. Louis, Mo. Oct. 28

As TRAVELING SALESMAN or as ENGINEER with some hot water heating company; can make drawings, estimates and write the specifications for any kind of work; has had the practical experience; references given. "J.," Heating and Ventilating Engineer, 445 Twelfth street, Toledo, Ohio. Oct. 28

By a good PLUMBER; can read plans; would like a steady position; married; can furnish references; would work on shares; West, South or East; steady and reliable. "R. B. C.," care John Flynn, 331 West Seventeenth street, New York City. Oct. 21

By a young man as PLUMBER; four years' experience in Pennsylvania; would like to be under instructions for another year or so; willing to work, and will furnish own tools. Philip Marten, 2196 Second avenue, New York City. Oct. 21

A complete line of first-class cutlery to sell on commission in New York State direct from manufacturer. Clarence Reynolds, Buffalo, N. Y. Oct. 21

Steady position with some good firm by a practical CORNICE and SKYLIGHT MAKER, TIN, SHEET IRON WORKER; can work from plans, lay and cut out all kinds of work, and do all classes of hammer work by hand; steady and sober; capable to take charge of shop if necessary. "W.," Box 2, 261 Atlantic avenue, Brooklyn, N. Y. Oct. 21

By a first-class CORNICE CUTTER and MAKER in some good shop; patterns cut in the best and quickest manner possible; long experience; references if required. "Pattern Cutter," Box 1021, office of *The Metal Worker*, 96-102 Reade street, New York City. Oct. 21

By a practical TINNER of 20 years' experience in all kinds of inside and outside work, furnace, cornice, roofing, dairy and all kinds of piece work; I want to start a first-class shop; will furnish tools and stock if I can get with some good, reliable firm; I am sober and reliable; can furnish good references; Wisconsin, Illinois or Minnesota preferred. "W. E. P.," Lock Box 3, Granton, Wis. Oct. 21

By a TRAVELING SALESMEN, one who has traveled in the house furnishing goods lines; has traveled East, West and South for the past ten years; also has a good trade in the vicinity of New York and Brooklyn. "E. T. H," No. 1021, office of *The Metal Worker*, 96-102 Reade street, New York City. Oct. 21

By practical cornice worker as CUTTER or FOREMAN; steady situation desired; can furnish A1 references. "Practical," office of *The Metal Worker*, 220 South Fourth street, Philadelphia, Pa. Oct. 21

A first class PLUMBER and GAS FITTER, having city and country experience, would like a steady position with a reliable firm; can furnish best of references. "T. J. J.," 14 Almira street, Bloomfield, N. J. Oct. 21

By a first-class PLUMBER who understands his business; would like to go South or Southwest; those in want of a first-class mechanic will learn of such by addressing 126 West Clay street, Richmond, Va. Oct. 21

By a first-class CORNICE MAKER and SHEET IRON WORKER, who is also an all around jobber; can do all kinds of zinc, galvanized iron and stamped work; situation wanted with a first-class firm, where work will be guaranteed the year round. Jno. Arnold, Fort Smith, Ark. Oct. 21

By young man as PLUMBER and STEAM and HOT WATER FITTER and fair tinner; do not want fancy pay, but steady job; can furnish best of references as to honesty and workmanship. Chas. Williams, Box 48, Port Henry, N.Y. Oct. 21

By an all around man on tin and sheet iron work, steam and gas fitting and plumbing. "Plumber," Lock Box 274, Erie, Pa. Oct. 21

By a practical ELECTRO PLATER of over 30 years' experience upon work of every description; have had charge of the polishing, buffing and plating departments of the largest stove works in the United States and Canada. "Electro Plater," 26½ Prosser street, Cleveland, Ohio. Oct. 21

A perfectly capable man guarantees that he is just the one you have been wishing to find as confidential and trustworthy SALESMAN. "Worthy," office of *The Metal Worker*, 96-102 Reade street, New York City. Oct. 21

A competent SALESMAN wishes a staple line of goods to sell in Western territory during the winter; would start out at once. "J. D. F.," office of *The Metal Worker*, 96-102 Reade street, New York City. Oct. 21

As CLERK, by young man, seven years' practical experience in hardware, stoves, paints, house furnishing goods; understands the above in all details; can also do any shop work required; location no objection; first-class references; moderate terms. O. A. Pell, Rochester, N. Y. Oct. 21

Would like to correspond with parties in need of a first-class PLUMBER, SHEET IRON WORKER and FURNACEMAN; can do gas piping. "H. D.," 33 Pleasant street, Attleboro, Mass. Oct. 21

By a first-class SHEET IRON WORKER, a permanent position; experienced in the working of heavy sheet iron and capable of laying out any kind of work. "J. S.," 177 East Third street, New Albany, Ind. Oct. 21

TINSMITH, married, wants permanent job; 20 years' experience in tin, copper, brass and sheet iron work, stoves, furnaces, roofing and general jobbing; country preferred. "Tinsmith," 338 Twenty-second street, South Brooklyn, N. Y. Oct. 21

As TRAVELING SALESMAN with stove manufacturer; best of references; several years' experience. J. G. Allor, Clinton, Iowa. Oct. 21

I want a situation with some good hardware firm in the South or West as BOOKKEEPER and SALESMAN or BOOKKEEPER; best references from present and past employers. "O. C. C.," care of State Board of Agriculture, Lansing, Mich. Oct. 21

A FINIAL MAKER and RAISER, makes his own dies for stamped work, first-class mechanic, married, wants permanent situation; wages must be good. K. M. Dedrick, 112 Adelaide street, Winnipeg, Man. Oct. 21

As TRAVELING SALESMAN for manufacturer of steam supplies or specialties; ten years' experience; best of references. "J. W. B.," P. O. Box 744, Philadelphia, Pa. Oct. 14

THE METAL WORKER.

NEW YORK AND CHICAGO.

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DAVID WILLIAMS, - PUBLISHER

BUSINESS OFFICES:

NEW YORK.....96-102 Reade Street.
PHILADELPHIA.....220 South Fourth Street.
BOSTON .....146 Franklin Street.
PITTSBURGH..... Room 509 Hamilton Building.
CHICAGO..... 59 Dearborn Street, cor. Randolph.
CINCINNATI .... Rooms 22-24 Pickering Building
ST. LOUIS.....Bank of Commerce Building.
CLEVELAND..... 312 The Cuyahoga.

BRITISH AGENCY: The Ironmonger, 42 Cannon street, London, England.

Filtration of Sewage and Drinking Water.

The increasing interest in as well as the importance of sewage disposal and the proper purification of drinking water is well evidenced by some of the recent papers and reports upon the subject. The greatest contamination of town and city water supply usually occurs when this supply is taken from or near a river which either intentionally or otherwise receives the sewage of communities higher up the stream. That the water in such a river can actually be rendered harmless and not a transmitter of disease has been very conclusively proved by extended experiments upon the part of the Massachusetts State Board of Health. Carefully collected data have shown that where there is the usual municipal water supply the organic matter, representing the polluting agent, is present in the proportion of, say, 2 parts in 1000 in the discharged sewage. As about one-half of this proportion is mineral matter and practically harmless, it is evident that the problem presented in sewage filtration is to remove only this 1 part in 1000. Of course, when sewage of this composition is discharged into a flowing stream of even moderate size the proportionate presence of the polluting elements is vastly decreased. Dilution, however, is not the remedy; the death-dealing organism must be absolutely destroyed or removed. Even the river Elbe, with all its volume of waters, could not annihilate the cholera germs which from a Russian settlement were carried down to the water supply of Hamburg.

Sand Filtration.

The efforts of the Massachusetts Board of Health have been largely devoted to a study of the effects of various grades of sand arranged in banks for intermittent filtration upon the waters of a sewage polluted river. Their investigations have served to emphatically confirm the results of other investigators to the effect that, by a proper arrangement of settling basins and sand filters, water polluted to the degree of ordinary sewage may be rendered practically harmless. That such a simple and comparatively inexpensive means can be introduced for the purification of drinking water on a large scale is a strong reason why no community should allow its residents to be exposed to the dangers incident to the ordinary system of water supply. The efficiency of sand as a filter for injurious organic matter is most clearly shown in the case of certain sewage farms, where the liquid, diluted sewage is delivered in large quantities upon the absorbent earth of the farm. It is said that the water, filtering downward through the sandy subsoil of the sewage farms of Berlin, becomes as pure as any spring water when it reaches the sandy trenches which surround the large and successfully managed sewage farms of that city. The time is not far distant when the discharge of sewage into flowing streams which serve as water supplies to other communities will be absolutely prohibited by law, and when Boards of Health or similarly constituted bodies shall have full authority to approve or reject proposed sources of water supply for towns and cities.

Economy in Gas.

An item printed in a recent issue is suggestive of possible economies in gas used for illumination, and, in fact, the use of all other illuminants. The item recounted experiments to determine the effect of color upon the number of lighted candles needed to obtain equal illumination in rooms finished with different colors. In respect to it a correspondent writes that believing experiments with so many different lights—the smallest number named being 15 candles, and the largest number 100—would not give as good a practical indication of possible savings in domestic illumination as experiments performed with only one or two lights, or about what is customary in moderate sized rooms in dwellings, he repeated the experiments in two different rooms of the same size, one papered with very dark redish-brown paper and the other with a pattern the general tone of which is a light buff with small gilt figures.

Experiments with Gas.

He used 5-foot burners, situated alike in each room, regulating the burners so that he could read the same kind of print with equal ease at a distance of 12 feet from the lights, and measuring the gas burned in four different experiments in each room by an ordinary dry meter. He states that he found the results even more favorable than was indicated in the item alluded to, in which 87 candles for brown paper and 60 for pale yellow were required for equal illumination. In the brown room he burned, during four experiments of three hours each, 98.4 feet of gas, and in the yellow room 62.2 feet. This is a close verification of the accuracy of the original experiments with candles; and it shows that in selecting wall paper a consideration of its effect upon gas bills—probably very little thought of in general—would be wise for those who wish to study household economy.

The Outlook.

A study of the causes which have led to the prolonged business depression possesses interest chiefly because their correct appreciation will enable business men to observe the signs of a return to a normal condition. We believe that it is quite generally acknowleged that the distrust on the part of foreign holders of securities as to the inability of our Government to continue the monthly purchase of silver safely was the first impetus on the downward path. When the financial cyclone struck first our banks and then our business and manufacturing community, consumption was proceeding at a normal rate. The condition of the money market cut off all those enterprises of a public character which depend upon the marketing of new issues. The iron industry was among the first to feel the effect. A second effect was to lead to the cessation of all repair work on our railroads, which induced the canceling of old orders and held back any new work. Simultaneously the frequent failures brought about a very cautious method of operations among large traders. The rapid decline in prices induced buyers all over the country to purchase from hand to mouth, since they were convinced that every successive purchase could be made at lower and lower figures.

The wholesale suspension of work threw out of employment many thousands of men, while the mass of the industrial population had to submit to reductions in wages. Enforced economy reduced consumption of the staples, and the retail trade which was last to feel the effects of the panic began to suffer severely.

The recovery must be along the line traversed in the downward path. One of the troubles which has been at the root of the evil has been cleared away. Money is as plentiful as it ever has been. But it will take a long time before it galvanizes commerce and in-

dustry with renewed life. There are elements in the situation which make moneyed men still cautious. It takes time before a capitalist grows tired of having his money unproductive, before the eagerness for better interest overcomes the fear for the safety of the principal. The wage earner who has been forced to draw on his hoard of savings, or has run into debt, does not become a liberal buyer as soon as his income is restored to its usual amount. In other words, consumption rallies only slowly from the check which it has been subjected to, and that holds true as well for the requirements of great undertakings as for the necessities of the mass of the working people.

A good deal of stress is laid by merchants upon the fact that stocks of all classes of manufactured goods in the hands of the traders and jobbers who are nearest to the consumer are lighter than ever before. It must be conceded that that is an important element in the situation. But it is not likely to have much influence upon prices, so long as the buyers know that there is a very large reserve manufacturing capacity. At the present rate of consumption there must be considerable swelling of trade before manufacturers are sufficiently confident of future orders to hold back for better figures. Another point which aids in retarding recovery is that a period of sinking prices causes buyers to adhere to a policy of purchasing in small amounts and withholding orders as long as possible. It is true that this ultimately creates a very rapid upward movement, which in the past has culminated in historic "booms." There are those who see in the present situation all the elements of such a phenomenal rise, but with the tariff question looming up as a very disturbing factor there is no prospect of any marked advance in any quarter in the near future.

Manual training is about to be introduced into the public schools of Brooklyn, a sum of $10,000 having been appropriated to this object by the Board of Education. This will defray the expenses of the first experiment in this direction, which will be in the shape of a manual school to be established in the Boys' High School, where the rudimentary principles of several trades will be taught to lads recommended by the principals of the schools.

The mysterious purchase by a New York commission house, within the past few days, of the new American built steamer "El Cid" of the Morgan line and her alteration into an armed cruiser, together with the acquisition by the same parties of some $200,000 worth of arms, has given rise to much speculation as to the destination of the purchases. The general conviction is, however, that the Brazilian Government are the principals in the transaction. Later reports have it that Ericsson's submarine torpedo boat "Destroyer" and the swift steam yacht "Feiseen" have also been secured for the same quarter, as well as "El Rio," sister vessel to "El Cid."

The Old Time Tin Shop.

BY FOSSIL.

In the days long departed when manufacturing was in its infancy, when every community had its quota of mechanics whose product was absorbed by local consumption, there were tinners and tin shops which were little like those that have succeeded them, except that the use of a like material gave a like name. The old shop and the old workman were for a specific and rather limited purpose, to wit: Assortment work; or the turning of tin plate into the various domestic utensils which housekeeping called for. We will not go back to the ante-machine times, but will name some now common which then were not often found in the average shop: Circular shears, double seaming, beading, crimping, forming and the more modern machines; but the raising block and hammers, also hand wedges and hollow punches, were hardly ever missing. Iron stakes were then, as now, an important part of the plant, and were increased in number and varied in form as necessity prompted invention. Every piece of everything manufactured was cut to a pattern, consequently they (the patterns) were numerous and hung on much of the available wall space.

Let us imagine ourselves at work in the old shop and about to commence a lot of milk pans. First of all we lay on the bench a pile of 10 x 14 sheets from the IX box, and by giving them singly a peculiar handling select the number required, all of uniform gauge. Then followed consecutively the marking out by pattern, usually on alternate sheets, which were then secured so as to be cut out double. The sections or "pieces" next go to the "folder" or "French horse." Don't know why so called! A style of machine now obsolete, which had two levers and required six motions to turn an edge. After this the pan maker straddles a wood former and bends the pieces to proper curves—locking of seams, wiring, burring, marking out of bottoms with compasses, cutting every part with bench shears, double seaming with mallet and stake and soldering. We remember that it took 22 operations in the old shop to convert the tin plate into a finished pan, and yet a day's work was quite a pile. All concave forms, like covers and tea kettle breasts, were made with the raising block and hammer, for stamping presses were not as yet. Economy of stock was desirable, and every available scrap was used. Among the rudimentary articles in whose making apprentices cut and burned their fingers were whistles, half-pint cups and pepper boxes. Those were the halcyon days of tin peddlers, whose carts went to and fro in the land exchanging "Tin pots, tin pans, tin nutmeg graters, tin cooking kettles for your fish and 'taters," for any commodities which their Yankee cuteness could turn into currency at a profit.

Many a treasure was found by the peddler's small boy among the junk that "Pop brought in;" curious things in old metals, including toy cannon, and much to be coveted among the rags. One of our peddlers found a copper wash basin in possession of an old maid, who fancied that the use of it was causing her to lose her youthful bloom. He told her the metal was very deleterious, and kindly (?) exchanged a new tin basin for the old hand-made without seam, and a little cash to "boot." The injurious copper was used in the shop sink for 20 years after for the ablutions of dirty tinkers.

It was said of the peddlers that they either carried or would furnish to order any article of merchandise, which assertion was indorsed by two yarns which are ancient, like our topic. One of the itinerant merchants being obliged to "put up" for the night at a country tavern agreed to pay his bill with any tinware that the landlord should choose. The demand of the host, who was of long and lanky build, was for a pair of tin pantaloons, and the peddler produced a pair of candle molds as the nearest to a fit that he had. Another, looking up trade in a Southern State, hailed a plantation house, on whose portico some young people were sitting, with "Want any tinware to-day?" "Have you got any tin side saddles?" responded a lady wit of the party. "I don't carry any in my cart," said the peddler, "but can furnish 'em to order. I'll take your measure and bring you a nice one, warranted to fit, if you like."

Domestic Electric Heating Facilities

Some of the London electrical supply firms are reported to be taking practical steps toward enabling the general public to enjoy the advantages of electric heating in their homes. They are not only lending out electric cooking stoves to customers, but are prepared, says an exchange, to supply a separate meter and charge half rates for cooking, which they can afford to do, inasmuch as the consumption takes place during the day, when the dynamos must generate electricity, and when there is little demand for lighting purposes. Besides these ovens there are breakfast cookers, in which eggs and bacon may be cooked on the breakfast table; electric plate warmers, which are being ordered for London clubs, for they can be kept in the dining room without any offensive smell; electric foot warmers, hot plates, stew pans, kettles, flatirons, ornamental screens, which act as radiators of heat and warm a room; electric curling iron heaters for ladies and electric shaving pots for gentlemen.

Herr G. Wegner, a goldsmith of Berlin, recommends for soldering aluminum and its alloys a flux made of 80 parts of stearic acid, 10 parts of zinc chloride and 10 parts of chloride of tin. An ordinary soft solder can be used, but one of 80 parts of tin and 20 parts of zinc is recommended. The pieces of metal should be cleaned sand dampened with the flux, and the solder then applied in the usual way.

A delegation of merchants and carriers doing business with Venezuela, Colombia and Hayti interviewed the President, at Washington, on Saturday, with the object of obtaining a suspension of the policy of retaliation against those republics.

Japan claims to have the swiftest cruiser afloat, in the "Yoshino," lately built for the Japanese navy by Armstrongs. The vessel, which is 350 feet long and of 4000 tons displacement, is said to have made an average speed, with and against tide, of 23 knots an hour.

THE LETTER BOX.

What Use is a Trap Well?

From F. A. H., *Southampton, L. I.* —Will you kindly inform me through *The Metal Worker* what benefit can be derived from the following fixtures required by a set of specifications? "Put a 4-inch trap in running line with clean out and foot vent. Tap the 4-inch trap on the house side of the seal and put in a 1½-inch Cudell trap with the inlet end 1 inch above the seal of the 4-inch trap. Build a trap well and grade it so that it will empty into the Cudell trap. The drain from the cellar and two ice boxes to empty into the well." What I want to know is, where should this well be located? How big should it be? What benefit can be derived from it?

Answer.—The location of such a well will be governed by the grade of the cellar and the location of the ice boxes, as it is built to receive their drainage. The Cudell trap is probably used with the intention of providing a seal mechanically should the water seal fail through evaporation. In size the well need not necessarily be large to answer its requirements, 6 inches or more in depth and of sufficient dimensions, whether round or square, to be readily cleaned. Its use is first to receive the drainage and next to facilitate the cleansing of the cellar with water. The trap connection is to prevent the escape of sewer gases.

Asbestos Furnace Cement.

From L. R. B., *West Branch, Mich* —I wish to ascertain what is to be mixed with dry asbestos to make a cement for furnace work. I was informed that water was the proper liquid to use with asbestos for forming a cement that would set. The experiment was tried, and the result was the water would evaporate and leave the asbestos dry and crumbly.

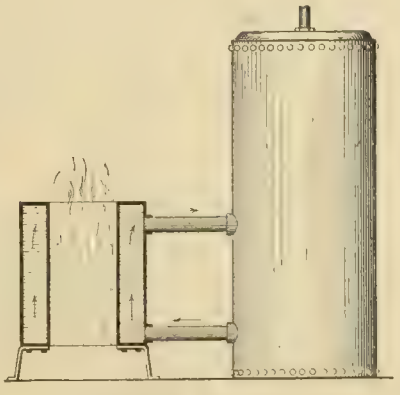
Answer.—It is supposed our correspondent desires a cement for packing the joints about a heating furnace, and while a cement might be made by combining fire clay with asbestos and mixing with water, it is recommended that asbestos furnace cement be used, which is an article especially prepared for the purpose.

Flat Tops for Furnaces.

From W. M. S, *Binghamton, N. Y.* —I notice that furnacemen have much trouble in making flat tops for furnaces, especially if they are large, the difficulty being to keep the hoop in shape so as to get the size. The method I employ is easy and correct. I first get the circumference of the top hoop and from that the corresponding diameter. If, for instance, the circumference is 16 feet 9 inches the diameter will be 5 feet 4 inches. I turn off a ¼ inch edge on my hoop, the diameter secured being 5 feet 5 inches, the correct size. This rule is also applicable in putting bottoms on large cans.

An Antique Water Heater.

From C., *Connecticut.*—Among the antique water heaters was one which seems to remain in principle alone, the construction having been superseded by later inventions. With the object of inquiring if your older readers remember making or using such a heater, and to give a pointer which may be useful to the younger, I give herewith an illustration which will explain itself. It consists of a double cylinder or annular chamber made to fit like a chimney over an oil lamp or stove. The flame will heat the water in the side tank with which the heating cylinder is connected by pipe for circulation, and cooking may be done at the top of the heating cylinder.



An Antique Water Heater.

Pattern for Ship's Ventilator.

From W. J. T., *Philadelphia.*—I would like to see a method published in *The Metal Worker* for obtaining the patterns for a ship's ventilator. The diameter of small end being known, is there any rule for obtaining the diameter of large end?

Answer.—Articles regarding the obtaining of patterns for a ship's ventilator were published in *The Metal Worker* of August 22, 1891, and July 8, 1893, and to these our correspondent is referred. Regarding the second question, we are not aware that any particular rule is in use among the mechanics for obtaining the relative areas of the ends of a ventilator. If any of our readers employ such a rule we should be pleased to learn of it for publication in *The Metal Worker.*

Cleaning Foundry Windows.

From M. W. H., *Cleveland, Ohio.*—In answer to the query in *The Metal Worker* for a method of cleaning foundry windows, they can be thoroughly cleaned if they are washed with strong aqua ammonia and pumice stone, then allowed to dry and polished with a cloth. Two applications may be required to remove all of the rust.

"Necessity" Pipe Union.

From C. W. B., *Fresno, Cal.*—In your issue of October 14 appears the article from "J. W.," "Necessity Pipe Union." Doubtless the idea was original with him, but a similar joint has been in use in California for the past 20 years to my knowledge. We do not use the expander, but cut the running thread long enough to take on a lock nut ahead of the socket. After the socket has been drawn off, in place we wrap a string of hemp or other packing around the pipe and against the socket, then back the lock nut against it. This makes a permanent joint and is the only union joint, in our humble opinion, except right and left couplings, which cannot always be put in for lack of room in which to spread the pipes.

Making Solder.

From J. W. C., *Fillmore, Y. N.*—Will some of the practical readers of *The Metal Worker* tell me how to make solder? I have tried to make it but it don't look as bright as that which I have bought. It looks frosty and when it gets cold holes come in. I cast it in sheet iron molds.

Note.—Doubtless some of our readers can give this correspondent some valuable hints from their experience in making solder. In the meantime we would suggest that by melting his lead first and then putting in the tin, and being careful to stir it thoroughly and keep it continually stirred as he pours it off, he will be more likely to get an even mixture of tin and lead. The proportion that he uses depends upon the fineness of the solder that he desires, half lead and half tin being looked upon as an excellent standard. For some work a larger percentage of tin is used. In other cases more lead than tin is used, but we think that good tinners think that the finest solder works enough better to pay for the difference in cost by the time it saves.

Carrying Water Over a Hill.

From E. A. W., *Vermont.*—If a ½-inch lead pipe were laid from a spring over a hill 39 feet above it and then down to an outlet 77 feet below the top of the hill, could the water be made to run through it? I ask this question as there are several different opinions as to whether the water can be brought over the hill.

Note.—Accompanying our correspondent's letter is a diagram showing a pipe running from a spring over a hill 37½ feet high, then down a slight depression and then over a second hill 1½

feet above the first one, or 39 feet altogether above the level of the spring. Then the pipe descends 77 feet. We presume our correspondent's question really is whether the water can be syphoned over, or drawn by a pump at the outlet end. This, however, is impossible, as a perfect vacuum in the pipe would not raise the water over either of the hills. The maximum hight to which the water could be raised by vacuum is 34 feet, while in practice it is probably somewhat less. It would be necessary, therefore, to pump the water over. By forcing it from the spring side of the hill the water can be driven to any elevation, depending upon the amount of power exerted. It cannot, however, be made to run by syphonic action.

Laying Cast Iron Water Pipe.

From J. H. F., *Pennsylvania.*—A question arises to day which I would like to have the readers of *The Metal Worker* answer. In laying a 12-inch cast iron pipe to conduct water to a town from a dam which is probably 200 feet above the town, which is the proper way to lay the pipe, with the bell end next to the dam or fountain head, or with the bell end next to the outlet? I have been informed that an authority decided some time ago that it made no difference, while I am of the opinion that it makes a great difference, which way the pipe is laid.

The Dragon as an Ornamentation.

From E. G. L., *Texas.*—Will you please answer through *The Metal Worker* why the dragon is used so much recently as an ornament on houses?

Note.—This question is a good deal out of *The Metal Worker* line, and we must be excused from replying to it as an expert in architectural ornamentation. The dragon, as is well known, is a common ornament in China. Exactly what function it fulfills or what it typifies we do not know, but we are quite sure it is of very universal application in the Flowery Kingdom. The fact that the Chinese have come to the Pacific Coast and have spread over the West of late years may, in some way, be an explanation of the introduction of the dragon into architectural ornamentation.

Water Back and Boiler Connection.

From C. J. P., *New York.*—To make further suggestions to "G. E. M." of New Hampshire, whose trouble with a range boiler was explained in *The Metal Worker* of October 14, would say that if he will elevate his boiler in its present location so that the top of the boiler will be slightly above the door casing, shown in the illustration, he can run the return from the water back up over the top of the door and connect it at the top of the boiler, when it will work satisfactorily. The cold water pipe from the boiler to the water back may be run under the door, as shown in the cut, without disadvantage. In running the pipes care should be taken to have all the bends made with long easy curves, and to support them with a sufficient number of lead tacks to prevent sagging. The connection at the top of the boiler would have to be made with the hot water service pipe, as it is hardly probable that the opening on the side of the boiler could be raised so as to be above the top of the door. If the connection was made at the top of the boiler the opening on the side would have to be closed with a cap. If "G. E. M." follows out this plan he will experience no difficulty in getting hot water and a free circulation.

Momentum and Work.

In *The Metal Worker* of October 21 in a note to a letter about rivet hammers, we spoke of a 1-pound hammer traveling 2 feet a second delivering the same blow as a 2 pound hammer striking with a velocity of 1 foot a second. A correspondent calls attention to the fact that while this is true as a measure of the momentum of the blow it is not correct as showing the comparison between the work (used in a mechanical sense) of the two blows, the relative quantities of work that moving bodies perform being found by multiplying their weights by the squares of their velocities. From that point of view the lighter hammer would deliver double the blow of the heavier one.

The Progress of Cooking By Gas.

The following extracts are from a paper read before the North of Ireland Association of Gas Managers, and published in the *London Gas World.* The writer says:

The first authentic record I can find of the use of gas for cooking was 43 years ago, in 1850, when there was a somewhat remarkable scene witnessed in the ancient city of Exeter. In the center of a large crowd, the object of a good deal of jeering ridicule, stood a French *chef.* The Royal Agricultural Society was holding its annual meeting in Exeter, and this French *chef* had been engaged to superintend the cooking of the banquet.

He tells us that he determined to signalize the occasion by serving a new disb, viz., "A Baron and Saddleback of Beef *à la* Magna Charta," weighing 535 pounds, or close upon 5 hundredweight. To roast such a joint at one time was a difficult thing to do, on account of the immense fire required; and former attempts, it seems, had not always been successful. A crowd gathered, in expectation of seeing a large bonfire lighted; but to every one's surprise, all that was visible was an oven 6 feet 6 inches by 3 feet 3 inches, constructed roughly with a few bricks and a few sheets of iron. Into this temporary oven were introduced 216 very small jets of gas, through pipes ⅛ inch diameter. The onlookers were incredulous, saying it was impossible so enormous a joint could be roasted by such means. But after eight hours' roasting it was found to be thoroughly cooked, at a cost (in those days of dear gas) of less than 5 shillings; and it was carried on the shoulders of eight men through the streets of Exeter, preceded by a band playing "The Roast Beef of Old England," and followed by a crowd of some thousands. The hero of this animated scene was Alexis Soyer, probably the greatest master of the culinary art ever sent to our shores by France. Soyer was *chef* to the Reform Club of London, and superintended all the great banquets of his day. Soyer tells us, speaking nearly half a century ago, that he "knew well the power and efficacy of gas for cooking."

In the following year (1851), at the Great Exhibition in London, a patent gas cooking oven was exhibited by Alexander Graham of Glasgow. This oven was fitted with luminous jets inside—the gas issuing from three small needle holes in each burner, while an iron boiling ring on the top was provided with similar jets bored with four holes instead of three. As yet the bunsen burner had not been used. Mr. Graham was a well-known and highly respected hotel proprietor and *restaurateur* in Glasgow; and a number of his *confrères* in his city and neighborhood were induced to follow his example in the use of gas for roasting. Mr. Graham made and sold a limited number of cookers for hotels and restaurants, but as yet the use of gas ovens for domestic purposes was practically unknown. About this period we find that gas cookers, made by various makers, appeared in London, Birmingham, Leicester, &c.

Very strong prejudices had to be encountered and overcome before gas obtained anything like a popular hold on the ordinary consumer, and thoroughly established itself as an indispensable auxiliary in every first-class kitchen. The average cook, who, with perfect equanimity exposed a chop or a steak to the fumes of a coke or coal fire, shuddered at the thought of a joint being exposed to the same fuel in a purified state as received from the gas works.

About this time the value of gas as a fuel was brought to public notice by hiring out gas cookers at a small rental by the gas companies, who then looked on the electric light as a great rival.

At the same time, the leading medical journal, the *Lancet*, began to advocate the use of gas for cooking and heating; and this helped very materially the extended use of gas for these purposes.

In 1882 a very valuable contribution was made to the subject by Dr. Stevenson Macadam. By careful and prolonged experiment with the cookers of three leading makers, Dr. Macadam arrived at some very important and definite conclusions. One of these was that the cooking of meat in the gas oven yielded a larger return of cooked meat than in the coal oven. It was found (and this has since been amply demonstrated by other experiments) that while a joint cooked in the coal oven lost 40 per cent. of its weight in the process of cooking, the same joint would lose only 25 per cent. of its weight in the gas oven. "To a large extent," says Dr. Macadam, "the difference of 15 per cent. is due to the meat being constantly surrounded by an aqueous vapor derived from the combustion of the gas. The influence of this moist atmosphere not only kept the meat more moist, but hindered the escape and the evaporation of the juices; retaining the osmazome or flavoring matter, so that the meat, when properly done, is more juicy and more palatable, and yet free from those alkaloidal bodies produced during the confined cooking of meat in the coal oven, which are more or less hurtful, and even poisonous." Dr. Macadam further pointed out that the meat, being more juicy, is also more easily digested. This testimony on the part of so high an authority tended to dispel the remaining prejudices against gas cookery, and very soon rapid strides were made in the direction of improved construction of gas stoves, and in the number of corporations and companies who hired them to their consumers.

HEATING AND PLUMBING.

NEW WORK AND CONTRACTS.

THOMAS WEATHERED'S SONS, 244 Canal street, New York, recently closed the contract for heating a double residence in New York, which they claim is one of the largest hot water jobs in the city. It will require two of their No. 6 double dome boilers and 47 radiators.

L. H. FREEDMAN of New Haven, Conn., is to build an $8000 residence, which will be heated by steam.

J. W. BEER has just completed the installation of a steam heating apparatus in the Episcopal rectory at Plainville, Conn.

THE DAVENPORT STEAM HEATING COMPANY of Davenport, Ohio, have a contract for heating and plumbing the new school house in that city.

THE CONTRACT for putting in the heating apparatus in the Capital Fire Insurance Company's new block, on School street, Concord, N. H., has been awarded to Lee Bros.

CHAS. J. GOULD has the contract for heating the Congregational Church and new vestry, at Plymouth, N. H., and is putting in the Richardson & Boynton Company's Perfect hot air furnaces.

THE PENN ENGINEERING COMPANY of Philadelphia, Pa., have been awarded a contract for the installation of a steam heating plant in the new building being erected by N. Snellingberg & Co., clothiers, at Twelfth and Market streets of that city.

W. KILT of Ottawa, Canada, has been awarded a contract for making sanitary improvements in the new county court house at a reported price of $1150, with the proviso that the work must be completed by December 15.

DANIEL W. WILSON of New Bedford, Mass., has been awarded the contract at $981.23 for heating No. 8 engine house of the fire department. A direct steam system will be used.

R. S. BRIGHAM has bought out the tin business of H. B. Daus of West Concord, Vt. His past experience fits him to continue the business which he has purchased.

A. F. COLBURN is having a larger heating apparatus put into his residence, at Bradford, N. H., by Mullican & Davis of Wells River, N. H.

N. & J. N. VAN DEUSEN, who have been carrying on the business of tinsmithing and plumbing at Stockbridge for about half a century, have been awarded the contract for plumbing the country residence of Charles E. Butler, and are working on several other buildings in the same city.

WORK HAS BEEN COMMENCED on the new sanitarium at Lowell Island, Mass. A heating plant and some plumbing fixtures will be required.

PROPOSALS will be invited shortly for the heating apparatus in the new Government building at Danville, Ill.

THE BAKER & SMITH COMPANY, 193 to 197 Van Buren street, Chicago, have the contract for steam heating and electric lighting in the Grand View Hotel, formerly Leland Hotel, Michigan avenue and Jackson street. The double pipe high pressure system is to be removed and an improved single pressure system substituted. A horizontal tubular boiler will be used in connection with about 23,000 feet of radiation.

EGLEHART & KREBS, Chicago agents for the Superior line of furnaces for warm air and hot water, are placing the Superior furnaces in the following residences in Chicago and vicinity: H. B. Mathews, Jr., 32 Clarkson court; Geo. Fairweather, 363 West Indiana street; Mrs. Mary Bush, 377 Loomis street, and Samuel Lanyon, South Waukegan, Ill.

FLASHINGS.

THE T. NEW ROOFING & MFG. COMPANY of New York City were incorporated on October 27, to carry on the business of the T. New Roofing Company in the manufacture of roofing and water tight construction. The capital of the concern is $200,000, and the directors, Tobias New, Lewis W. Harrington and Merritt L. Pike of New York City.

WE HAVE RECEIVED from the Penn Iron Roofing & Corrugating Company, Limited, Philadelphia, Pa., supplemental sheets for insertion in their art catalogue. One of the separate pages give illustrations of plain reeded ceiling sheets, of which six styles are shown, being oval reeded $\frac{1}{4}$, $\frac{3}{8}$ and $\frac{5}{8}$ inch centers; diamond reeded $\frac{3}{16}$ and $\frac{5}{8}$ inch centers, and half oval reeded 3 inch centers. Another page shows special shallow panel ceiling plates made up in panels of different sizes, one large illustration showing the plates in various combinations. The third sheet shows the body plates of rock faced metal covering, also beaded mortar line rock faced metal covering. The fourth sheet shows various center and molding combinations, giving handsome effects, one side of the page carrying a large illustration of combinations in body and cover. The half-tone engravings are printed on fine paper, bringing out all their delicate shades and ornamentations.

THE ÆTNA STANDARD IRON & STEEL COMPANY, Bridgeport, Ohio, have published a serviceable pamphlet descriptive of their manufactures. The iron and steel products of this concern cover an extensive line, including iron and steel bars, rails, angles, tees, channels, miscellaneous shapes, sheets and plates. Also what is of especial interest to our readers, corrugated, galvanized and roofing sheets. The first page of the pamphlet gives information relative to bar iron, then corrugated and other forms of roofing are referred to. It is mentioned that the list of prices and weights was omitted from the catalogue as a change in both will be necessary on or before January 1 to make them in accord with the United States standard gauge for black sheets. Several pages are given up to sections of angle iron, showing dimensions and shapes. Other tabulated information is contained in the pamphlet, which will be found of interest throughout. At the close are a number of blank pages for memoranda.

THE NEW YORK METAL CEILING COMPANY have recently moved to new quarters at 614 West Twenty first street, New York. Here they have greatly enlarged facilities, their building occupying a space of 100 x 150 feet, and several new pieces of sheet metal working machinery have been added to their plant, among which are two drop presses. A portion of the building is partitioned off for a lacquer and drying room, they making a specialty of colored lacquer work for side walls as well as ceilings. They are distributing a 50 page catalogue, with half-tone engravings showing their different patterns of metal ceilings, corrugated, embossed and stamped in various designs, with cornices, faiences and moldings. Various designs of sunken embossed and flat embossed panels for side walls, as well as centerpieces for ceilings, are shown. Wainscoting, borders, coves and friezes are illustrated in a variety of designs adapted to the panel work. Several pages are devoted to half-tones of finished ceilings in different buildings, one page showing how a wainscoting can be applied to a stairway with handsome effect. Another page is devoted to general information, giving questions and answers that will prove useful to all who are interested in this subject. It is stated that their goods are used by carpenters, decorators and tinners.

THE AMERICAN ROOFING COMPANY, St. Louis and Cincinnati, report a gradual improvement in the demand for roofing iron and supplies. Their Pacific Coast trade is keeping up with last year, and they expect to pass last year's record for that locality before this year is out.

C. FREES & SON, Thirteenth and Callowhill streets, Philadelphia, have recently been installing some new sheet metal working machinery manufactured by George A. Ohl & Co. of Newark, N. J.

LYLES & MILLS, 231 William street, New York, have recently added to their plant of sheet metal working machinery one of the Miner & Peck Mfg. Company's of New Haven, Conn., patent drop lifters and hammer and anvil. The drop lifting apparatus weighs about 2000 pounds; the hammer weighs 1200 pounds and the anvil 9000 pounds. The face of the anvil is so arranged that large and small dies can be used, according to the design and size of the panel being worked.

N. A. HALDEMAN & Co. of Philadelphia, manufacturers of steel and iron roofing and awnings, now have an office in New York at 136 Liberty street, under the management of G. M. Maicas.

H. S. NORTHROP, manufacturer of sheet metal ceilings, cornices and ornamental work, at 38 Rose street, New York, has recently put sheet metal ceilings in churches at Housatonic, Mass.; Atherton, Mass., and Canajoharie, N. Y.; also in the Odd Fellows' Hall at Woonsocket, R. I., and a number of private residences. The use of metal ceilings in private residences is growing.

Crop failures and the large migration of farmers to the newly opened Cherokee strip are said to have almost depopulated a section of Southwestern Kansas. The secretary of the State Senate reports that in six counties at least the general exodus has been sufficient to disentitle them to representation in the Legislature.

The Irrigation Convention, lately in session at Los Angeles, Cal., is likely to give considerable impetus to the irrigation movement in the West, where nearly 300,000,000 acres of land might be made productive and populous by the general adoption of such a system. Congress will be urged to take up the matter at as early a date as possible.

PLUMBING and GAS FITTING.

Dissatisfied New York Plumbers.

Suit has been brought against the Examining Board of Plumbers, appointed under the new plumbing law in New York City, by Thomas J. Kelly, who claims to have been damaged to the extent of $10,000 in his business. It is a test case in the Supreme Court before Judge Barrett, and is intended to contest the constitutionality of the law. To further this end 75 plumbers recently held a meeting and organized the Employing Plumbers' Protective Association, with Thomas J. Kelly, president; James Cantwell, secretary, and John Kelly as treasurer. It is stated that the object of the association is to effect, if possible, the repeal of Chapter 602 of the laws of 1892, the claim being made that the Examining Board have refused to grant licenses to competent plumbers.

There are in New York a number of men carrying on the plumbing business who are not themselves practical plumbers, or capable of passing an examination, who have yet done their work satisfactorily by employing competent help. Under the law such men, not being able to take out licenses through their inability to pass examinations, are cut off from doing work that requires a permit from the department, although in the past some of these men have been enrolled as licensed plumbers and their work has been accepted by the inspectors. The master plumbers admit that some provision should be made to meet such cases, and some of the men who are withheld from doing plumbing work by the new law look upon its provisions in the main as tending to the public good. While the result of the suit and the new association is not likely to end in the repeal of the law, it is not impossible that some amendments to its provisions may be made.

The Syphon Eduction Grease Trap.

The Walcott-Hurlbut Company, 175 and 177 Lake street, Chicago, are putting on the market the Syphon Eduction grease trap, which is herewith illustrated. This trap is designed to take the place of catch basins, which must be regularly cleaned or the sewer will be clogged. The grease trap, on the other hand, cleans itself. It can be placed under the floor in private residences, but it is preferably located in the cellar, as shown in Fig. 1, thus giving the grease a better opportunity to cool before being washed out of the trap. The grease congeals and forms on the surface of the water in the trap, and is broken into small pieces upon the discharge of the automatic flush tank, which has no movable parts and is not liable to get out of order. Upon the action of the tank the grease trap is entirely emptied, the cold grease being carried out by the rush of water, and is thus prevented from adhering to the sides of the sewer pipe, which is washed free of all deposits. As more water is provided in the flush tank than is required to clean out the trap, the sewer pipe is thoroughly flushed, which makes it possible to use a back water trap without danger of its becoming clogged. The traps are made in three sizes, as follows: No. 1, shown in Fig. 2, for hotels, 4-inch outlet and 40-gallon flush tank. No. 2, Fig. 3, for residences, 4-inch outlet and 20-gallon flush tank. No. 3, shown in Fig. 4, to be placed under sink, 2-inch outlet and 5-gallon flush tank.

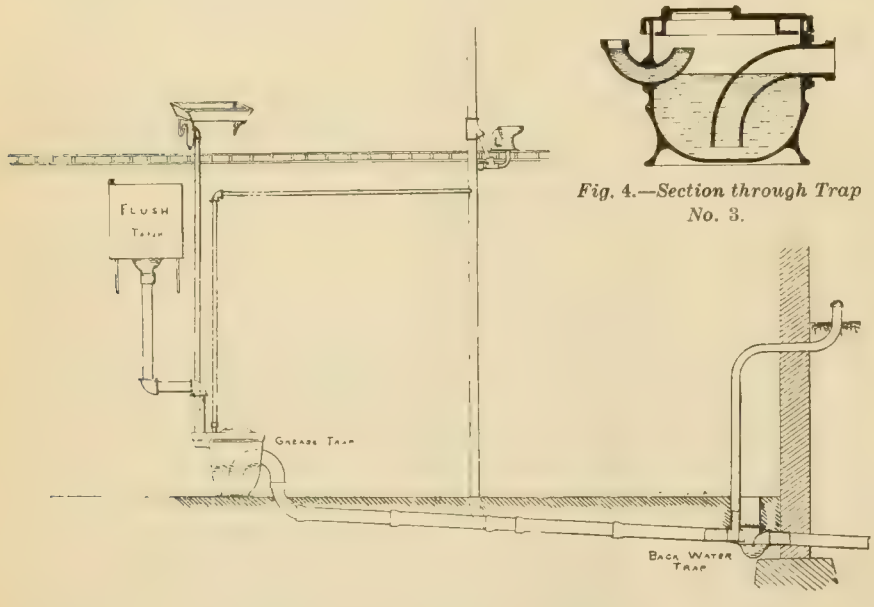


Fig. 1.—Showing Location of Trap in Pipe System.

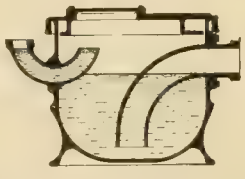


Fig. 4.—Section through Trap No. 3.

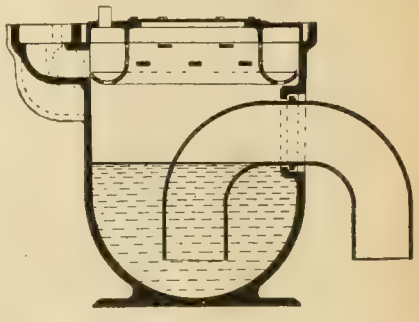


Fig. 2.—Section through Trap No. 1.

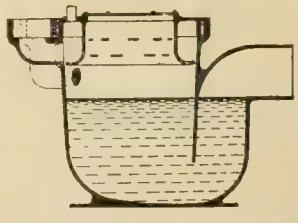


Fig. 3.—Section through Trap No. 2.

THE SYPHON EDUCTION GREASE TRAP.

New York Licensed Plumbers.

Previous to the enactment, by the State of New York, of the law known as Chapter 602, there were 960 licensed plumbers in New York City. The total number of the plumbers carrying on business in the city at the present time is not definitely known, but it is supposed to be something over 1000. Up to the present time 852 applications have been made for examination. Of this number 565 have taken out certificates, 51 certificates are ready to be given to the applicants on their demand, 101 papers are under consideration previous to the certificates being awarded and 68 unexamined applicants' names are on the list for examination, while 77 applications have been rejected. A large number, though not all, to whom certificates have been issued have applied to George Hackett for licenses and have filed the necessary bond. From this it will be seen that only a trifle over 50 per cent. of the plumbers in New York have complied with the letter of the law, though, doubtless, they are doing odd jobs. Some have experienced difficulty when they have applied for a permit to do work without having taken out the license, and in every case a license has been taken out after such an experience has been had.

SIGMUND OESTREICHER, City Engineer of Aachen, Germany, was a recent visitor at the Department of Public Buildings in New York City. The

object was to learn something of the plumbing system and regulations adopted in this country. He expressed his surprise at the advanced character of the work required. Henry D. Dickinson of the Bureau of Plumbing and Ventilation not only presented him with a set of regulations under which the New York plumbers work, but also a set of plans showing how the work is done in a modern New York residence.

The Dandy Clean Out.

We show in the accompanying illustration the Dandy clean out, which is being manufactured by Thomas Hyde, Albany, N. Y. The device is very simple and needs but a word of explanation. The brass cap shown screws directly into the opening, making, it is claimed, a perfectly tight joint without

The Dandy Clean Out.

the use of packing. The size of the opening is the same as that in the pipe. The clean outs are made in 2, 3, 4, 5 and 6 inches, both standard and extra heavy.

TRAPS AND VENTS.

BREWSTER & DRAPER of Northampton, Mass., are completing the plumbing in the Foote Block and have just begun the plumbing in the new residence for Miss Marie Warner.

D. J. HARRINGTON & Co. of St. Paul, Minn., recently had their plumbing establishment damaged by fire to the extent of $250.

AN ORDER was recently passed by the Common Council of Boston, Mass., to have the school committee examine into the sanitary condition of the school house in the Dorchester district and report at the next meeting.

GEORGE BURCHMORE, a gasfitter 76 years of age, recently died at his home at Malden, Mass.

AT A RECENT MEETING of the journeymen plumbers, at Newport, R. I., a new union was formed, with a membership of 22, with John P. Steel for president, John Cassidy and Joseph M. Brown vice-presidents, Michael F. Kelly and John J. Murphy for secretaries, Michael J. Sullivan for treasurer, H. B. Murphy and Thomas A. Kelly for sentries. The new union will shortly give a social entertainment.

WILLIAM ROSS has recently started a plumbing shop at Billings, Mon.

THE QUESTION as to what constitutes a practical plumber has arisen in Waltham, Mass., and the City Solicitor has been called on to decide. This was brought about by the recent appointment of an inspector of plumbing.

THE DISCHARGE of the inspector of plumbing practically closes plumbing work in Denver, Col. The new health ordinance provides that a job of plumbing must be approved by the inspector before the plumber can collect his bill. A committee representing the Master Plumbers' Association waited on the City Attorney to ascertain if some kind of relief cannot be afforded.

THE UPPER BODY of the city government of Springfield, Mass., recently made and passed a new plumbing ordinance of 19 sections, which will hereafter govern all plumbing work done in that city.

THE DETROIT *Free Press* states that the house to house inspection of the plumbing fixtures and sanitary condition of property in that city has ceased and has been a failure in both a political and sanitary sense, owing to the inspectors being appointed as a political reward rather than for their fitness for the work and the fact that the funds gave out earlier than was desirable.

A PRETTY CEREMONY at the Harlem Presbyterian Church was the marriage of Miss Emilie E. Young to Lloyd Rowan Wilson. The bride was given away by her father, Wm. Young, a plumber at Third avenue and Sixty-fifth street, New York.

HE rushed in and inquired:
"Are you a gas fitter?"
"I am."
"Then I wish you would come and look at my gas. It has fits."—*Exchange.*

THE MASTER PLUMBERS of Utica, N. Y., recently held a meeting in the Arcade Building and had as their guest vice president John Mitchell of the National Association of Master Plumbers.

AMONG the revised rules and regulations passed by the examining and supervising board of plumbers and plumbing of Utica, N. Y., is a rule which provides that "no privy vault or cesspools for sewerage shall be constructed on any premises situated on any street where connection can be made with a public sewer and the city water in the side street." Clerk George St. Ledger and Inspector David McKeough are located in an office in the city hall attending promptly to the duties of their respective positions.

A WRITER in an exchange reports that the condition of the plumbers in Portland, Maine, has been greatly benefited by ordinances regulating the methods for doing work and requiring the registration of workmen and inspection of all jobs in that city, claiming that this is partly due to the City Inspector, H. W. Straw, being a practical plumber.

HENRY D. DICKINSON of the Bureau of Plumbing and Ventilation of the Department of Public Buildings of New York City recently made a visit to his old home in England. This is Mr. Dickinson's first trip abroad for 22 years, and from what he saw on the other side he does not hesitate to praise the plumbing as done according to the New York regulations.

THE SMITH & ANTHONY COMPANY, manufacturers of the Sanitas plumbing specialties, 219 Lake street, Chicago, are setting up a full line of Sanitas closets on one side of their salesrooms.

SCRAP.

THE ISLAND OF TASMANIA produced in the year 1892-93 5006 tons of tin, valued at £2,000,000.

THE VALUE of the tin produced in New South Wales, Australia, last year was $734,371, as compared with $642,818 in 1891; the largest annual production since 1880 having been $2,700,000 in 1881.

NOTICE IS ISSUED to the trade under date of November 1 by Mortimer H. Cort, agent, 9 Burling slip, New York, that he has started in business as an importer and dealer in Tin Plates, Pig Tin, Sheet Iron, Zinc, &c. Mr. Cort has been connected for over 17 years with the firm of N. L. Cort & Co., and is well-known to the metal trade.

THE CINCINNATI CORRUGATING COMPANY of Piqua, Ohio, have been awarded a premium for their Piqua brand of terne roofing plate at the World's Columbian Exposition.

The State Pardon Board of Pennsylvania, in session at Harrisburg last week, refused to recommend executive clemency to Hugh F. Dempsey, ex-master workman of District 3, Knights of Labor, and Robert Beatty, convicted for participation in the Homestead poisoning cases and now undergoing sentence in the Riverside Penitentiary.

Coastwise traffic between New York and Southern ports has shown a large increase during the past week or two, a number of extra steam vessels having been put on to meet the demand for freight. Provisions and dry goods compose to a large extent the cargoes going south, while cotton fills the north bound steamers. An unusually large amount of cotton is now in this city awaiting shipment to Europe.

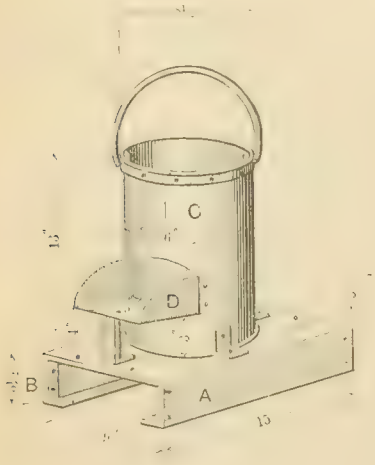
The new United States gunboat "Machias" returned to the Brooklyn Navy Yard from her final trial at the end of last week. The trial trip extended a distance of about 360 miles, and the "Machias" was kept under persistent headway for 48 consecutive hours, being put through a searching inspection in every detail. The Board of Inspection reported her as acceptable, and the vessel was accordingly accepted by the Government. She will probably be ordered to the China Station shortly.

The Standard Oil Company have just received what is probably the finest oil barge ever built. It was constructed at Roach's shipyard, Chester, Pa., and is built of steel throughout. The vessel has a molded length of 248 feet, beam 37 feet and depth 19 feet, and possesses a carrying capacity of 760,000 gallons in bulk, with a gross tonnage of 1599. She is schooner rigged and carries four masts.

THE TIN SHOP.

Roofers' or Tinners' Fire Pot.

From W. N.—For the benefit of roofers or tinners, who always require a fire pot for soldering purposes, I submit a perspective view of a fire pot two dozen of which were made during the winter months for use when our busy season begins. The fire pots were made of No. 20 best bloom black sheet iron of the dimensions shown in Fig. 1. Fig. 2 is a sectional view, showing the method of seaming the round bottom on to the body of the fire pot, and riveting the bottom to the base. The following will make clear how the fire pot is constructed. After the base A, shown in Fig. 1, is formed place and rivet the angle B, which is made of light brace iron, at each end of base, using the band iron with which the sheet iron is packed. After the braces are riveted on, run the bottom, shown at A in Fig. 2, through the turning machine until an upright edge or flange is obtained. Now rivet the bottom on to the base, as shown in Fig. 2. Next lay out the pattern of the body C, Fig. 1, cutting out the opening into which the soldering irons are placed before forming up on the rollers. After the body C is rolled up and riveted, a band iron ring of the same material as before mentioned is placed and riveted on the upper top edge of the body. Now form a handle of ¼-inch gutter rod, and punch a hole of the required size on either side of the body, as shown, through which to secure the handle.



Roofers' or Tinners' Fire Pot.—Fig. 1—Finished View, with Dimensions.

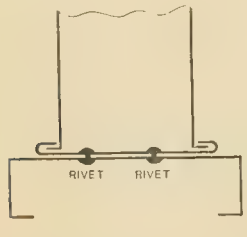
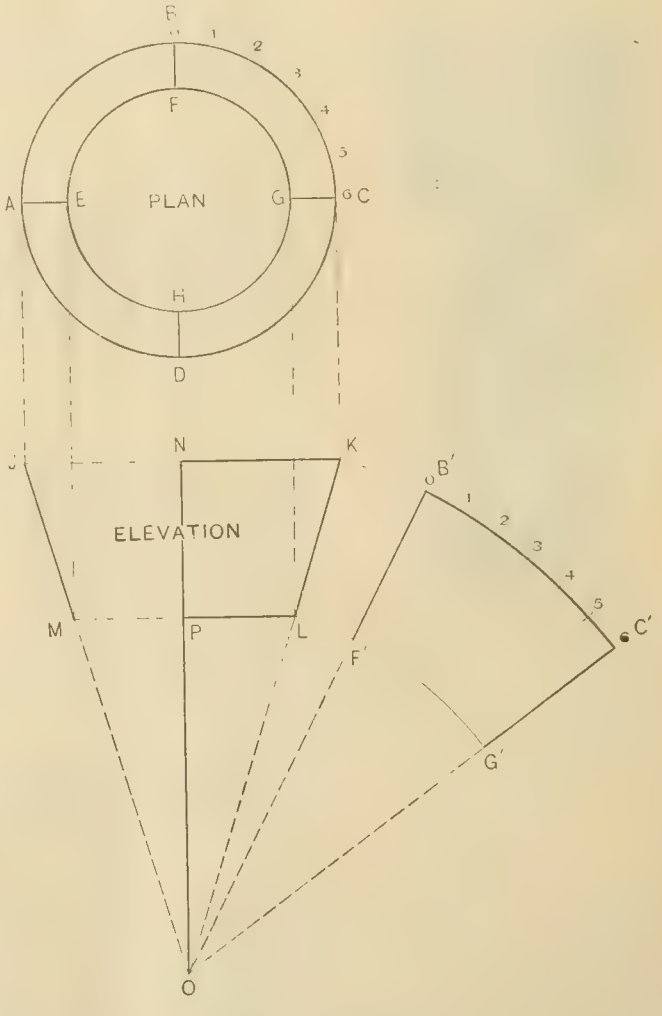


Fig. 2.—Sectional View through Bottom.

Then form up the lip D, Fig. 1, allowing flanges for riveting on to the body. Place the body in its proper position on top of the flanged bottom and seam, as shown at A in Fig. 2. It will be shown that the lip D, Fig. 1, is raised higher in the front than at the body; this is done so as to keep the soldering iron or hot coal from dropping out when moving the fire pot from place to place. An angle is riveted to the lip and to the base A, as shown in Fig. 1. This angle helps to sustain the lip and keeps it from breaking off when the soldering irons are placed on it. The small angles on either side of the pot and at the rear are riveted in place, and give strength and stiffness to the entire fire pot. In practice two sizes are used, the large size, as shown in Fig. 1, for heating heavy soldering irons, and the next size, whose base is 7½ x 12 inches and the rest of the pot made in proportion, is used for heating smaller irons for soldering upright seams. In case the fire pot is left at the building over night it should always be placed upside down, so that in case of rain no water will settle at the bottom of the pot, which would in time rust it out.

Pattern for Flaring Article.

From F. J., *Rochester, N. Y.*—In the accompanying diagram let A B C D represent the bottom and E F G H the top of a flaring article, which is also represented in elevation by J K L M. By extending the sides J M and K L until they meet at O, J K O represents the cone of which J K L M is a frustum. If through the elevation we draw the center line N O, N P will give the straight hight of the article, as M J or L K gives the slant hight. We will suppose the article is to be made in four pieces, one of which is shown by B C F G of plan. Divide B C into any convenient number of parts, as shown by the small figures. From O as center, with O K as radius, strike the arc B′ C′, extending it indefinitely. From the same center, with O L as radius, strike the arc F′ G′. With the straight edge placed at O and B′ draw a line across the two arcs, as shown by B′ F′. From B′ on B′ C′ space off a stretchout of B C of plan, as indicated by the small figures. From the last division (6) draw a line toward the center O, as shown by C′ G′. Then B′ C′ G′ F′ is

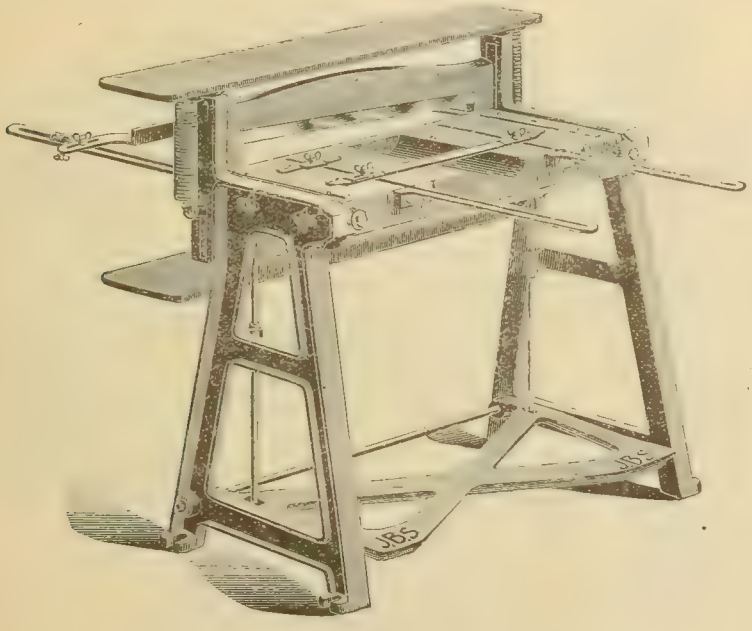


Pattern for Flaring Article.

the pattern for part of article shown on plan by B C G F. Much of the drawing shown in the illustration can be dispensed with in practice. The dimensions of the article being known, draw the right angle O N K Make N K equal to the half diameter of large end and N P the straight hight of article. Draw P L parallel with N K and from P on P L set off the half diameter of small end and draw K L, extending it until it intersects the center line N O. The pattern is then to be obtained as previously described.

New Squaring Shear.

The accompanying engraving shows a new tinners' squaring shear just brought out by Jacob Brombacher's Sons, 30 Cliff street, New York, the special features of which will be readily understood by a brief description. The bed, it will be seen, is securely held between the legs, cast in single pieces,



New Squaring Shear.

a feature of construction that is radically different from that of the old machine made by this concern, in which two pieces were employed connected to the bed by bolts. Again, the head or upper cutters of the shear in the new tool travel in solid gibs, instead of gibs made up of parts and held together by screws. The rigidity of the machine is increased beyond what is secured in the construction already named, by the rod which connects the legs at the bottom and which serves as a pivot for the treadle. This construction is also an improvement over the old plan of having the treadle swing on pins cast as integral parts of it. The adjustments of the bed are also to be noted. The bed is controlled by set screws in the front of the upper part of the legs. These are provided with jamb nuts so arranged as to hold the bed in whatever position desired. This is likewise an improvement over the old plan of moving it by the screw in one direction and hammering in the other whenever a change is needed. The front extension arms are put on with two bolts and the parts surfaced so as to make a smooth travel for the guides. The capacity of the shear is to cut a little over 30 inches between the right angle gauges. Two shelves are provided, one above the blade and one below, each of which is put on by means of dovetail brackets. The new machine is described as strong and powerful and, at the same time, is easy working, cutting smoothly with a minimum of strength exerted by the operator. The design of the machine has been carefully considered, the manufacturers say, and while no feature of strength has been sacrificed there is nothing superfluous about it.

The Evolution of the Nail.

The first nails produced in the United States were made by hand, and Fisher Ames of Massachusetts, in a speech made before Congress in 1789, when it was proposed to put a duty of a cent a pound upon all imported spikes, nails, tacks and brads, in order to foster the home product, said of this industry: "It has become common for the country people in Massachusetts to erect small forges in their chimney corners, and in winter and on evenings when little other work can be done, great quantities of nails are made, even by children. These people take the rod iron of the merchant and return him the nails; and in consequence of this easy mode of barter, the manufacture is prodigiously great. This business might be prosecuted in a similar manner in every State exerting equal industry."

In August, 1797, Samuel Briggs of Philadelphia, in connection with his son, is said to have received the first patent for a nail making machine ever issued by the United States, but as at about the same time several inventions for manufacturing nails were made by various persons in different parts of the country, it is still a somewhat disputed point to whom the credit of absolute priority is due.

In 1817 the device known as the Blanchard machine, an invention of Thomas Blanchard and others of Boston, was successfully demonstrated in practical use, and the patent sold to a company for the comparatively small sum of $5000. This Blanchard machine was intended particularly for small nails, brads and tacks, and is the basis of the inventions which are in use to-day.

It is a curious contrast presented by the contemplation of a family engaged at odd hours in their home laboriously shaping nails by hand a century ago and the product of a single day of any one of the many nail and tack factories in States which were then an unknown wilderness, or inhabited by wild animals and wilder Indians.

Fifty millions of small nails and tacks is the daily output of several of these factories, weighing in the aggregate a dozen tons or more, and distributed in all the markets of the world. A single machine is capable of cutting and heading over 15,000 tacks an hour, and shoe nails are cut at the rate of 2000 a minute.

It is not many years since it was the custom in many wholesale houses to keep the boys employed in idle moments picking up and straightening out stray nails which had been removed from packing cases The wire nail, which in its present form is a comparatively recent invention, has from its convenience and lesser cost so completely superseded the finishing nail and patent cut brad that there is little demand for these one time favorites.

New Publications.

PLUMBING, DRAINAGE, WATER SUPPLY AND HOT WATER FITTING. By John Smeaton, C.E., M.S.A., R.P., &c., Examiner to the Worshipful Plumbers' Company. Published by E. & F. N. Spon; 250 pages. Price, $3.

Any work on the subject of plumbing is sure to find ready acceptance. The wants of the American plumber, however, are yet to be met, for there is no adequate work telling him of his trade as practiced in the United States. The most elaborate books at the present time are of English authorship, and they relate to English practice, which may be very well in some particulars, and possibly is superior to American practice in certain minor points. Nevertheless, it is the style of work done in a foreign country, and therefore it is not of great practical benefit to the plumber here. The expert who has mastered all the elements of his trade can read a foreign work to advantage and learn where improvements can be carried out in the methods he is used to. The learner, however, would simply be confused by mixing up his information. It is much to be regretted that the technical literature does not supply a work on this most important subject; but until such a work is forthcoming plumbers will do well to get all the good they can out of the literature that is in existence. The work before us is a good book of its kind, and in it there is not a little that will be of interest and profit to the American reader. To give a rough sketch of its contents, the first 48 pages are given up to the subject of drainage, from which the American reader can gather suggestions both of what to follow and what to avoid, without, however, gaining the instructions particularly applicable to his own work. External plumbing is then considered, and includes the extensive line of work with which the plumber here has nothing to do—that is, the laying of lead roofs. The next 60 pages deal with house plumbing and water supply, which is strictly the business of the American plumber. Twenty pages more are given up to ornamental lead work. The practice in heating varies, perhaps, more than the practice of plumbing between the two countries. Nevertheless, the 40 closing pages of the work, which are devoted to the subject of heating, will be of interest to the plumber, who is awakening to the fact that he can, to advantage, add to his business the department of steam and hot water heating.

The Sague Galvanizing Machine.

Samuel A. Sague, vice-president of the Britton Iron & Steel Company of Cleveland, has invented a galvanizing machine which is in operation at the mill in question. The machine galvanizes 3000 sheets per turn of ten hours at a labor cost of $6.30 per day, the force being two men and a boy. In the ordinary dipping pot process the daily product is 800 to 1000 sheets at a labor cost of $10.25 for a crew of seven men and one boy. There is also some saving in acid and a lessened consumption of spelter.

The object of Mr. Sague's invention is to substitute continuous galvanizing for the ordinary process, which is described as follows:

The sheets or plates, as received from the rolling mills, in all cases, are first immersed in what is called a "pickling bath" which is composed of sulphuric acid heated in any suitable manner, the object of thus pickling the sheets or plates being to clean the same—that is, to remove scales and dirt that may be adhering to the surface of the sheets or plates. The action of the sulphuric acid, however, produces a spongy and irregular surface, the original smooth surface of the sheets or plates being destroyed. After pickling, the sheets or plates are washed in a tank of water; thence taken and laid upon a table and scraped by hand. Workmen, by means of hand scrapers, remove dirt and scales that still adhere to the sheets or plates. The work last referred to is not only necessarily slow and laborious, but it is almost impossible to thus satisfactorily remove all impurities and foreign substances from the surface of the sheets.

Next the surfaces of the sheets or plates are prepared for the zinc or spelter coating by immersing the sheets or plates in a tank supplied with muriatic acid, resulting in the formation of a flux upon the surfaces of the sheets or plates to enable the zinc or spelter to adhere thereto more closely and serving also to still further and more thoroughly clean the sheets or plates.

The sheets or plates undergoing treatment must be thoroughly cleaned preparatory to their immersion in the zinc or spelter bath. From the muriatic acid bath the sheets or plates are loaded on an iron car and conveyed to a kiln, where the sheets or plates are thoroughly dried. When dried the sheets or plates are ready for the zinc or spelter bath. This loading and unloading of the sheets or plates and their transportation to and from the kiln also requires much labor and time. The sheets or plates are next, with a longitudinal edge lowermost and in batches, immersed or dipped in the zinc or spelter bath. A tank or pot, as it is technically called, is filled with melted spelter or zinc, which is kept liquid by coke fires constantly burning around the tank or pot, the zinc or spelter bath being protected in any suitable manner to prevent oxidation of the molten metal, and sal ammoniac or a suitable flux being employed to give the coated sheet or plate a brighter appearance. Workmen handle the sheets or plates by means of tongs.

The treatment of the sheets or plates by the means just described is not only objectionable in that it is exceedingly slow and laborious, but the sheets or plates are not coated with uniformity. Some sheets or plates remain in the bath longer than others, and consequently the coating of the different sheets or plates of a bath varies in thickness. Then again, in withdrawing the sheets or plates from the bath it is impossible, by the means just described, to withdraw them at a uniform speed, and the sheets or plates are very liable to be jerked. This irregularity in the withdrawal of the sheets or plates from the bath causes the spelter to adhere to the sheets or plates unevenly and in patches, resulting in a waste of zinc or spelter, which is the more costly metal. Since the sheets or plates are placed in the tank lengthwise on edge, in withdrawing the same from the bath the molten metal coating of the sheets or plates necessarily gravitates to the lowermost longitudinal edges of the sheets or plates, resulting in an objectionable increase in thickness in the coating along these edges. After being coated with zinc or spelter the sheets or plates are wiped by hand, usually by means of canvas. The sheets or plates are lastly run singly through calendering rolls, for the purpose of straightening and smoothing them and putting them in good condition for shipment.

The continuous process which Mr. Sague uses in his machine pursues a more rational course. The accompanying engraving shows the apparatus designed. Mr. Sague pickles the sheet of iron or steel as heretofore and places it upon a table, A, at one end of the apparatus. From table A the sheet is fed to cold rolls, B, located in the required proximity to the delivering end of the table A and being of any suitable construction. Table A declines somewhat toward rolls B to facilitate the feeding of the sheet, water being discharged upon the rolls by means of the perforated pipe W to keep them clean. The effect of powerful cold rolling under water, after pickling the sheet or plate, is pronounced of vast importance by Mr. Sague, not only entirely removing the irregularities in the surfaces of the sheet, which irregularities are the result of the action of the pickling acid, but rendering the surfaces of the sheet or plate beautifully smooth and crushing and washing away all impurities and foreign substances. Rolls B deliver the sheet to the muriatic acid coating vat C. At the receiving end and ex-

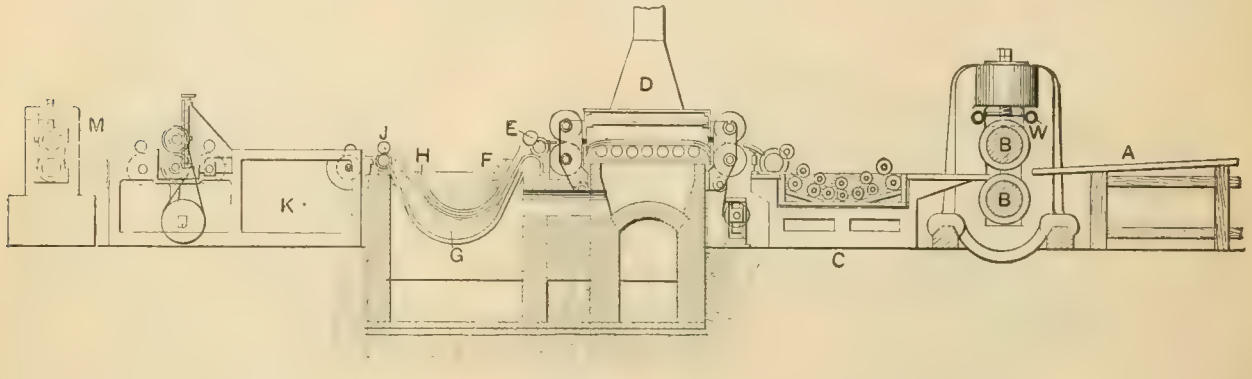


Fig. 1.—Elevation.

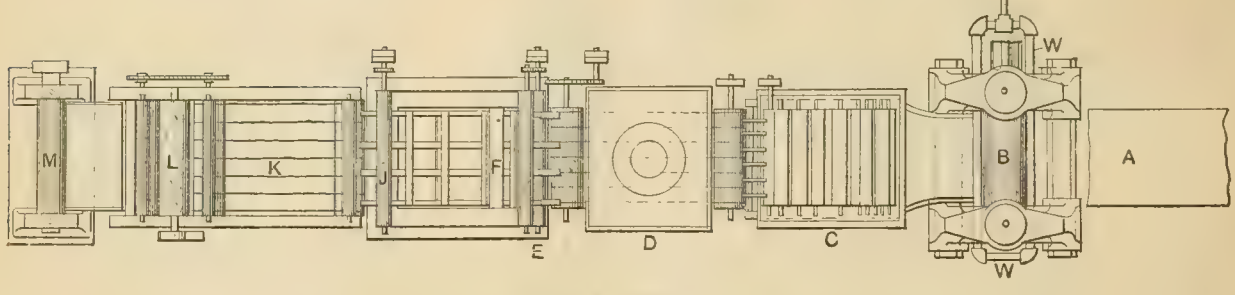


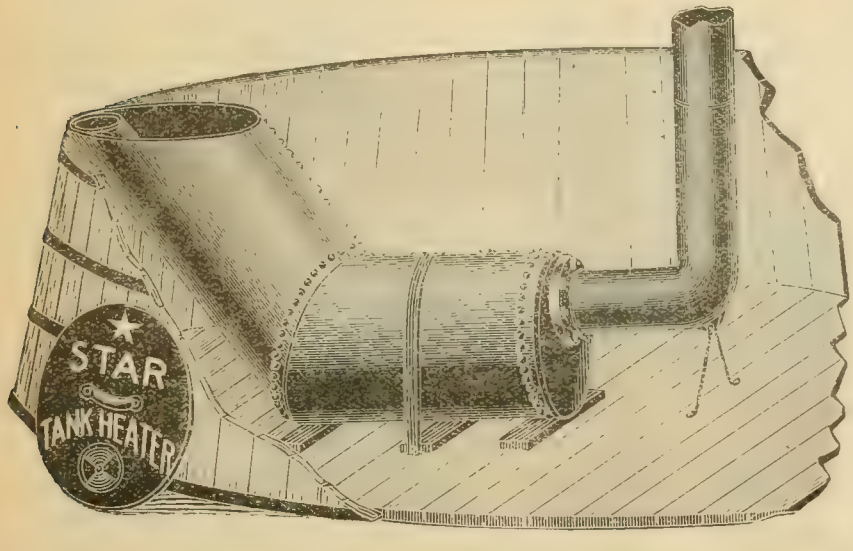
Fig. 2.—Plan.

THE SAGUE SHEET GALVANIZING MACHINE.

tending transversely of vat C are located a pair of suitable rolls adapted to receive the sheet from the rolls B, and the sides of the vat afford bearing for the trunnions of a series of guide rolls. At the delivering end of vat C are located suitable wringer or wiper rolls. The sheet is thus fed endwise through the muriatic acid bath between the upper and lower guide rolls to wringer or wiper rolls, whence the sheet or plate is fed between rolls to and through the drying chamber of a furnace, D. A pair of rolls is provided at the delivering end of the drying chamber of the furnace, from which the sheet passes to guide rolls E and is thence conducted through a suitable flux in box F into and through the zinc or spelter in the so-called "galvanizing" pot G. The sheet or plate is guided in its passage through the spelter bath by a pair of curved and parallel open frames, H.

Rolls, J, carry the sheet on to endless chains, K, that lead it to the brushing machine L, where the sheet is brushed clean. It is then fed to calendering rolls, M, that are adapted to smooth and finish the sheet or plate, and deliver it in proper condition for shipment.

The products of combustion from the furnace which is used to melt the zinc are conducted under the drying chamber, in order to utilize the waste heat.



The Star Steel Tank Heater.

The Star Steel Tank Heater.

An illustration is presented herewith of a tank heater which has been brought out by Hunt, Helm & Ferris of Harvard, Ill. As will be seen from the cut, it is a stove made of heavy boiler steel which is intended to be placed in the tank to be heated and is almost entirely under the water. It is intended to burn any kind of fuel—hard or soft coal, wood, chips or cobs—can be set in any tank without cutting the tank and the ashes can be taken up at any time without disturbing the fire. Being made of wrought metal exclusively, it is not liable to be broken in shipping, nor to crack or break when in use.

Statistics of the coal production of the United States for the year 1892, just issued by the Geological Survey, showed that 179,000,000 tons were put out last year, valued at the mines at $207,566,381. Of this amount Pennsylvania furnished 99,000,000 tons, or more than one-half.

Patent and Trade-Mark Laws.

A committee of the Patent and Trade-Mark Congress, having had the subject of formulating resolutions before them, reported as follows:

One of the rules under which auxiliary congresses are held is that no resolutions shall be passed relating to controverted matters. We have, therefore, confined those here presented to such matters as seemed to us to have the consensus of all of the opinions which have been heretofore expressed, without attempting to cover many of the valuable suggestions made.

Resolved, By this congress, assembled under the auspices of the World's Congress Auxiliary of the World's Columbian Exposition, for the purpose of considering inventions and trade-marks, and the various systems and laws relating thereto:

1. That for the purpose of encouraging improvements in the useful arts; the development of new industries; and to make it an object for inventors or licensed manufacturers to practically put inventions into operation, a sufficient protection should be given to them to warrant such an undertaking.

2. That as steam and electricity have brought all civilized nations near to each other, some practically uniform international system of granting patents should be adopted under which all of the patents of these several nations may be issued.

3. That some international system for repatenting or registering patents should be adopted by the several nations granting them, whereby patents granted in one country may be made effective in each of the others without burdensome fees, taxes or annuities.

4. That a requirement of working or of putting the invention into use within a stated time is an onerous condition which leads to the non-patenting and to a consequent non-use of inventions which require extensive plants or machinery, and that it is a condition which retards the introduction of inventions in the countries requiring it.

5. That all patents should for their duration be independent of patents for the same invention in other countries and be granted for the same term as that allowed by law for patents in the country granting them, and with no further restrictions than that the applications therefor be limited to the time fixed for applications by citizens and the date of grant antedating that of the oldest prior patent.

6. That a trade-mark valid in one country should be valid the world over to the first user, except only when antagonistic to local laws as to good morals.

7. That priority in the matter of trade-marks should be referred to the time of the commencement of a continuous user, and not to the date of a registration.

8. That a mark connected with a false indication of origin should be considered contrary to good morals.

9. That a committee of five be appointed by the president of this congress charged with the duty of bringing these resolutions before the Congress of the United states and the legislatures of other countries, as well as any future conference under the convention for the Protection of Industrial Property concluded at Paris, March 20, 1883, and to take such steps as they shall deem proper to perpetuate this congress as a body for the amelioration of patent and trade-mark laws in their international relations; that this committee have power to fill vacancies and to add to their number members from each country desiring to aid in these enterprises. L. L. Bond, J. M. Thacher, James Buchanan, R. J. Gatling, Francis Forbes, committee.

The committee also reported the following as proposed by Dr. Carl Pieper of Germany: That the culpability of dishonest competition should be universally established and efficiently enforced on the wide field of industrial property. This was also adopted.

We take the following from the *Railway Age* because it has a much wider application than to railroads alone: "A certain president was saying the other day that popularity among his employees was one of the worst traits that a railway official could have. It was always, he said, expensive to the road in the long run, and when a man came to be too well liked it was time he went to some other road. There is a good deal of shrewd truth in the remark, however unkind and illiberal it may sound. There is a kind of popularity which degenerates into familiarity and slapping on the back, and that, if it does not breed contempt, is certain sooner or later to injure the discipline of the road. Popularity which is won at the expense of respect is a dangerous attribute for any man who has to keep control of others; and even worse is that popularity which an official sometimes gains at the expense of his own superiors and of the other officers of his road. As soon as a division superintendent or an assistant of any kind stoops to win popularity among his subordinates at the expense of his chief, it is time he was got rid of. Perhaps the chief may deserve it and ought to be got rid of, too. But the other should go first."

Petroleum has been discovered in Susquehanna County, Pa. The Standard Oil Company are leasing all the land possible and will proceed with the boring of wells immediately.

THE RETAIL STORE.

Streeter's Mincing Knives.

N. R. Streeter & Co., Groton, N. Y., are putting a line of mincing knives on the market, as herewith shown. The handles are cast iron with detachable nickel plated blades. The blades are of fine steel so that they can be sharpened,

Fig. 1.—Streeter's No. 10 Mincing Knife.

and are made in skeleton shape to prevent clogging. Fig. 1 represents the one-bladed knife, the blade being held securely by a screw passing through the plates on both sides. In the Duplex knife, Fig. 2, the blades are held in position by a square shouldered bolt with a thumb screw. The blades of the Sensible knife, Fig. 3, are held by a heavy bent wire hook with a nut on the top. The knives, Figs. 2 and 3, have lugs or grooves to prevent the blades from turning and to assist in holding them rigidly in position. Thus the blades can be easily removed for sharpening or cleaning. The durability and attractiveness of the goods are features emphasized by the manufacturers; also the low price at which the knives can be sold, the Sensible, Fig. 3 for instance, being designed to retail for 25 cents each.

Horseshoe Rack.

We are indebted to Murphy, Maclay & Co., Great Falls, Mon., for a description of the Horseshoe rack

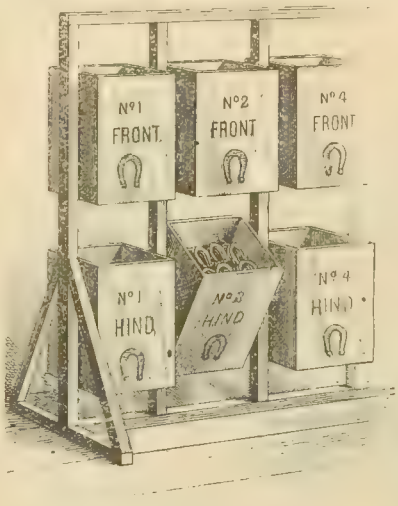


Fig. 1.—Horseshoe Rack.

shown in the accompanying illustrations, Figs. 1 and 2. The rack consists, it will be observed, of an arrangement of boxes, 12 x 12, 18 inches deep, which are suspended in a frame, as shown in Fig. 1. The construction of the boxes and dimensions are shown in Fig. 2. The boxes have on the sides a ¾-inch hole bored a little above their center, with wrought washers screwed against the sides to serve as bearings. A corresponding hole is bored in the uprights and a machine bolt used as an axle. Each box will hold about 125 pounds of Shoes. By tilting the boxes it is easy to get at Shoes for customers and also to replenish the boxes from stock. A sample of the Shoes kept in each box is fastened to the outside, with a printed designation of the kind and size of Shoe. The extreme hight of the frame is 4 feet 2 inches, and the frame is made of sufficient length to accommodate the required number of boxes. Murphy, Maclay & Co. use 32 boxes, which accommodate the three kinds of Shoes they carry. These boxes are divided among four frames, two of which have eight boxes each, one ten boxes, and one six boxes. They are located in the warehouse adjoining the store.

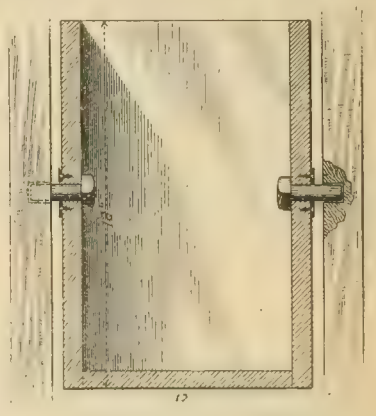


Fig. 2.—Size and Construction of Boxes.

Fig. 2.—Duplex Mincing Knife.

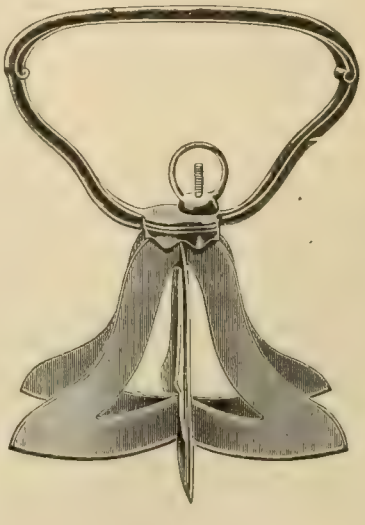


Fig. 3.—Sensible Mincing Knife.

Solid Steel Putty Knife.

The accompanying cut represents a solid steel putty knife, put on the market by Charles J. Healy, 106 Chambers street, New York. The knife is forged from a solid piece of steel, resulting in a handle and blade in one piece. The handle is embossed, and the whole knife nickel plated. A feature of the knife is the low price at which it is supplied to the trade, selling as it does at $1 per dozen.

Solid Steel Putty Knife.

How to Keep the Store Neat and Clean.

BY WALTER EIKEL.

That depends on the store—will be an answer which naturally forces itself upon one, when he considers the diversity of store buildings. Where the store means simply a salesroom, with samples only of large goods, and small quantities of shelf goods, the matter of neatness is not nearly as difficult as it is in a store where a single room represents salesroom, office and warehouse combined.

It is absolutely impossible to even imagine a perfectly clean Hardware store. There must be a corner, or a room, and often a number of corners or rooms, where unsightly and dirty things can be stored. Dirt is simply a question of distribution.

Neatness and cleanness mean not so much the absence of dust and dirt as the distribution of these unavoidable evils. When a portion of a store building is devoted only to the display of goods it is not a very difficult matter to keep this portion of the store perfectly neat and clean. Of course, goods will be left on ledges and in improper places during a rush of custom, but a clerk or clerks with an eye for neatness will soon find an otherwise unoccupied moment in which to remedy these irregularities.

INCLINED TO SLOVENLINESS.

"To have a place for everything, and everything in its place," is the great desideratum. This will only be reached when each individual is held responsible for a certain portion of the store, and when clerks who are by nature inclined to slovenliness (and there are such) are forced to be neat in their persons as well as in their surroundings, because a person slovenly dressed, standing behind the counter, will completely counteract the beneficial influence of a neat-looking store on a customer. Of course, it goes without saying that cleanness and neatness are a great attractive feature in a store Unhappily, many Hardware stores are so unclean and disorderly that ladies are afraid to enter them. In such stores goods are usually covered with dust: bright goods are to a greater or less extent corroded, often through careless sprinkling, all of which detracts from the selling qualities of the goods. It is a well-known fact that whoever buys goods wants them to be new, and wants them to look new. Even such people as will leave a new Axe in the open yard during a rainy night will not be satisfied to buy an Axe with a rust spot on it.

A SPRINKLING POT.

It is necessary to have a "general cleaning up" of the store once a day. This should commence on opening the store in the morning. It should be made an inflexible rule that all goods should be in their proper places before closing in the evening. By this the accidental sprinkling of water on goods left on the floor during the day will have been avoided. Much importance attaches to the use and abuse of a sprinkling pot. It is a very easy matter to spray a few drops of water into a Nail bin now and then, or on the base of counters and the legs of Stoves; but each drop will count, and will detract from the general appearance of the store. Even in so insignificant a matter as sprinkling it is necessary to use care and judgment. Of sweeping and dusting, the same may be said. It is impossible that these daily cleanings should be anything more than superficial. To make the cleanness of the store as nearly perfect as possible, it is necessary that on each day, after the general cleaning, and during leisure moments, a small portion of the stock be cleaned thoroughly. To do this, goods must be moved from their places and replaced after thorough cleaning. It is very disgusting for a would-be purchaser to have a cloud of dust blown into his face from the top of a bird cage which is being taken from its hook, and where it had hung unmoved since its arrival in the store.

SHOW WINDOWS.

Show windows (and showcases also, to a more limited extent) should contain samples only, so that it is not ordinarily necessary to remove part of a display to supply a customer. When it is unavoidable to thus "rob" a show window, the missing article should be immediately replaced, since nothing is less attractive than a show window with empty spaces in it. Better have no show window than to have one that is not absolutely neat and clean at all times.

CUSTOMERS SEE TOO MUCH.

New goods should in all cases be unpacked and marked as far away from the interference of customers as possible, preferably in the warehouse, and should be stored as quickly as circumstances will permit. It is very undesirable to have customers see too much of the inside workings of your business. It is therefore a necessity to have a place set apart for the storage of goods pending delivery, or the arrival of invoices, for unpacking and marking. Odd goods, such as samples of articles not in stock, should not be allowed to accumulate in any one place, but should rather be distributed among other similar articles. This will greatly increase the chance of selling, and thus removing them. Never should imperfect goods be allowed to lay about, least of all such as have been returned for imperfections. Broken articles should be either repaired at once, or, when that cannot be done, they should be removed, since all imperfect goods discredit perfect ones of the same kind. Next in importance to the buying and selecting of goods is the keeping of them neat and clean.

Streeter's Pot Scraper.

The cut herewith shown represents a pot scraper put on the market by N. R. Streeter & Co., Groton, N. Y. It consists of a nickel plated steel blade with a sharpened rounded edge, the blade being attached to a nickel plated metal handle. A combined pot chain and scraper also is made by the same company, in which a pot chain is hung to the blade of a scraper, similar in shape to the one shown in the cut. In operation the scraper blade is put on the pot chain for scouring, or the scraper may be used by itself. This arrangement obviates the necessity of the hand coming in contact with the pot chain when cleaning pots, kettles, &c.

Streeter's Pot Scraper.

STOVE TRADE NOTES.

Future of the Hot Air Furnace.

By A. W. Glessner,

President of the Excelsior Steel Furnace Company.

USING PIPES OF THE PROPER SIZE.

Steam and hot water men point with pride to the fact that within the past 10 years both steam and hot water heating have been reduced to a science, and that statistical matter pertaining to every branch of the business is at hand to guide the contractor and engineer in his work, and that very little is left at the present time to either theory or experiment in these forms of modern heating.

On the other hand they point out the fact that hot air heating in the past has been carried out on the "cut and try" plan and that no improvement has been inaugurated in the furnace business which would tend to reduce that form of heating to a science. To a certain extent the claim of the hot water and steam men is well founded, but at the present time they must not overlook the fact that a movement is at hand by which the furnace dealer is being supplied with reliable data of various kinds in regard to hot air heating, which data are the result of long experience in furnace heating and which if followed will leave to the furnace dealer little room for error. It will also eliminate very largely haphazard plans of doing furnace work in vogue in many parts of the country until within a comparatively few years.

Tables have been prepared and are accessible to the furnace dealer by which the capacities of various sized pipes, both round and square, are given, whether said pipes are figured in perpendicular position or as connections from furnace to boxes with the ordinary elevations of such pipes. Tables have also been prepared giving the sizes of registers in common use in hot air work, together with their equivalents in round or leader pipes, also their equivalents in square or riser pipes, as well as the number of cubic feet of space on first, second and third floors, which these registers with their equivalent round or square pipes will heat in the latitude of New York or Chicago. With such a table in the possession of the furnace dealer it would seem that very much better work could and would be done in the future than in the past.

One very frequent mistake that has been made in the past, both in the installation of furnaces and of the concealed hot air or riser pipes, is the failure to use both furnace and pipes that are large enough to supply sufficient air for heating the buildings in question. Owing to the partitions being formed of ordinary 2 x 4-inch studding, dressed down to about 3¾ inches, it has been necessary to make furnace pipes narrow enough to admit of their being placed in these partitions, although good judgment on the part of the owner and dealer would lead to the furrowing out of the partitions carrying the hot air to the upper floors.

In the judgment of the best furnace engineers the ordinary furnace pipe when placed in the partitions referred to fails to deliver sufficient air to heat large rooms on the upper floor, and, in fact, while the ordinary 4 x 12 or 4 x 14 stack is made to heat chambers and rooms of fair size, this is accomplished only by delivery to said rooms of air in small volumes heated to a very high degree of temperature. This is contrary to both the theory and practice of good hot air heating, which should be done not by "hot" air in small quantities, but by warm air in large quantities.

It is interesting to note, in the orders sent for furnace pipes by dealers throughout the country, the wide difference of sizes used for the same work. I have noticed that dealers who frequently order a large size register for heating some large room, which register would have ample capacity for heating the room referred to, but the capacity of the register would be reduced to nearly one-half by the use of a leader pipe not over half of the capacity of the register to which it led. Also, stacks 4 x 10 will be placed in partitions for heating rooms of good size, and while this size of pipe is totally inadequate for the requirements of the case, the round or leader pipes connecting with said stack would be probably 10 inches, or about the proper size of pipe for the room, but whose capacity would be nullified in large part by the small stack to which it was connected.

In the experience of many house owners rooms on the second floor are inadequately heated in extremely cold weather, even when the furnace is at a white heat and the air coming up through the registers at a very high degree of temperature, and the solution is of course very plain, as a sufficient volume of heated air cannot be introduced into the apartment to properly heat the same. Architects in many of the large cities have been looking of late into the question of proper pipes for the partition walls, and in more than one case, in the city of Chicago, architects, in drawing plans, are specifying the size of concealed pipes, and are providing partitions large enough to carry said pipes, and are doing this for the reason of the complaints from clients of theirs of inadequacy of the pipes that have been used in their houses.

In supplying these larger pipes the architects have had occasion to refer to the tables referred to in another portion of this article, and wherever pipes of the proper size have been used together with a furnace of ample capacity the architect has found that his clients were very much better satisfied. This move is certainly a beneficial one to the trade at large, and dealers everywhere would find it to their interest to co-operate with their local architect in seeing that plans provided by said architect specify distinctly the sizes of the concealed pipes, knowing that the result would be better work in the community, which would in turn lead to a larger demand for furnaces and directly affect the future of the hot air furnaces.

(To be continued.)

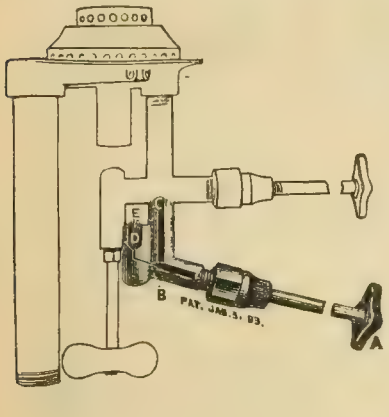
The New York Stove Trade.

Owing to the disposition to let the manufacturer carry the stock, a few chilly days in the early part of October brought an avalanche of orders to all the stove founders and jobbers, and at the same time a rush at the store of every dealer, which was due to the patrons of the local dealers being equally backward in placing their orders. The warm days that followed up this period were looked on alike by both the dealer and the larger houses as a positive advantage to the trade generally, for without them it would have been impossible to satisfy all the demands made upon them. This period, however, has lasted until a desire for a sharp cold snap is again expressed from both quarters. A feature of this year's trade that is manifest to all is the large demand for repairs, some foundry houses claiming that they are already behind on parts needed for goods that have been sold in large quantities in the past, and the smaller dealer finds that more of his time is occupied in making repairs to apparatus already in use than in putting in new apparatus. The sales of new goods, however, have not fallen to any discouraging extent behind the business of last year, and there is good reason to expect that large sales will still be made when the winter opens up with its full force. The stock first ordered by many of the dealers has been exhausted in supplying their first demands and has not been replaced. The few cold days in the early part of this week created a decided activity among shippers and made a material reduction in some of the stocks.

Attachment for Gasoline Stoves.

Borzell & Bardsley of 1925 Germantown avenue, Philadelphia, Pa., are putting on the market a starting attachment for gasoline stoves, as shown in the accompanying illustration. The attachment is adapted to any style of gasoline burner requiring to be heated to start the formation of gas. Its use is intended to do away with the open cup found on burners of the common class of gasoline stoves, and to which there is objection on the part of housekeepers, owing to the blaze incidental to lighting. It is also designed to act as a supplementary burner, keeping its principal primed with gas for instant lighting. In construction the attachment consists of a continuation of the feed pipe to the gas outlet to a point below, as will be seen by reference to the illustration. The oil passes around the original spindle, through pipe C to point D, and is prevented by the valve A from going further. By opening the valve A

the oil passes through cup D and saturates an asbestos packing, E, contained in same. In operation, a match applied to the tip of the packing E will create a blaze sufficient to convert the oil at the needle point into gas, which naturally forces the oil back through the burner; and the oil passing through the asbestos burns for about the same length of time as the oil in the ordinary cup. The upper valve is then opened to allow gas to pass through the spindle hole, the



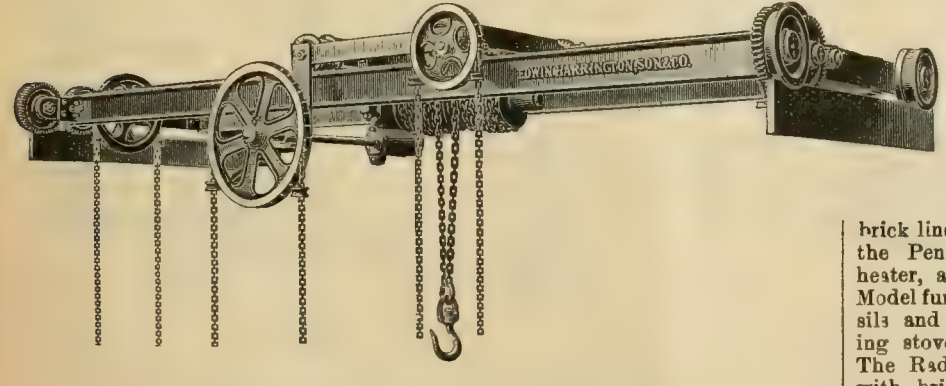
Attachment for Gasoline Stoves.

burner lighted and the valve A turned off entirely. It is claimed that in the event of the flame of the supplementary burner blowing out the oil will not leak or run, for the reason that the feed is so small that the first drop of oil would evaporate before the second could come down. When the stove is out of use for short intervals only, the supplementary burner may be kept burning and the stove is ready for immediate lighting.

The Harrington Special Foundry Crane.

Edwin Harrington, Son & Co. (incorporated) of Philadelphia have designed a crane especially adapted for use in stove foundries and other places where fine work is required. For the lifting of copes or molds the ordinary chain and sprocket wheel hoist is claimed to be unsuitable, as, no matter how carefully it is made, a chain running over a sprocket wheel will, as each link leaves its pocket, jar the load, which generally results in a cracking of the sand and a breaking down of the mold.

This crane was designed with a view to obviate this difficulty. It will be noticed, by reference to the engraving, that the sprocket wheels of the hoist have been replaced by a drum having right and left spiral grooves, in order to insure the hanging of the hook continuously over the same point. A sure and steady movement, without jumping or jarring, is in this way secured, the chain winding and unwinding with the regularity of a rope on a windlass, and allowing a cope to be lifted and lowered without danger of the sand sifting out or the mold breaking down. The internal gears of the hoist are operated by means of a shaft extended far enough beyond the beam of the bridge to prevent the chain from interfering with the load; this also enables the operator to stand at a respectful distance from a pot of metal. The crane is operated by geared wheels throughout, and the shaft, which is placed inside of the beam to save room, moves the crane by pinions and intermediate gears, all of which are furnished with roller bearings, producing easy movement.



THE HARRINGTON SPECIAL FOUNDRY CRANE.

The Mount Penn Stove Works

of Reading, Pa., have just issued a 104-page catalogue of their goods. It is of convenient size, printed on a fine quality of calendered paper, and bound in stiff paper covers, with illuminated side title. A view of their works, with special notices and suggestions regarding the making out of orders, are to be found in the opening pages. The New Royal Esther range, which is first considered, has been redressed for this season's trade, and presents a very handsome appearance. It is shown in four styles. The Majesty range, in two styles, appears next, followed by the New Queen Esther, recently redressed, in five styles, including a new one, which is shown with shut end attached to a boiler and which has been designed for the purpose of using an extra large water front, in connection with a circulating boiler, where an unusual supply of hot water is required. Next in order are Domestic, New Guardian, Osceola and Olivet ranges, the latter having been redressed since last season. Then follow the Oriental, Ornate, Delight, Onoko, Itasca, Raven, Robin, Ringgold and Grange or Albion ranges. The Penn Elmo is a new range, made either as a five-hole or six-hole stove, as required, and is adapted for use with a hot air attachment. It has the duplex grate or a plain flat grate, and enters the market as a reliable, low priced range. A page is devoted to pipe shelves, and prominence is accorded to a new pipe shelf, 28 inches long by 11 wide, and extending front over the top of the range 16 inches high in the clear. A hot air attachment for carrying unused heat from a range to an upper room is illustrated and described, and the announcement made that the attachment is now adapted to all the leading ranges made at these works A few pages are devoted to cook stoves and show the Automatic, New Albion, Famous and Panama cook stoves. In heaters the Penn Diamond occupies the place of honor. This is a new square parlor stove and double heater, and embodies the very latest ideas in heater construction. It was described in a recent issue of *The Metal Worker*, when its leading points were briefly mentioned. The Penn Royal double heater, Penn Grand single and double heaters and the Penn Rose small double heater are shown, also the Penn Fairy single stove and double heater, a new and handsome low priced small square parlor stove, with straight draft, full reversible flue and Ransom duplex grate, nickel plated swing top, tile plates, feet, skirting, foot rails and name plate, ornamental urn and tile. Penn Franklin stoves and fire place heaters take up some half dozen pages, followed by the Penn Jewel fire place heater, a new heater made in one size but having frames made in two sizes and three styles, square top, circular top and with elliptical corners, the latter for French mantels. It has a center discharge grate, fire brick lining, damper in smoke pipe collar, and a fire pot 12 inches diameter inside of brick lining. Other heaters shown are the Lulu, Vida, Medal, Artist, Fales, Dora, Lillie, Royal Essex, Dandy, Pansy, Ethel and Penn Ruby; the Penn Hero, a new high grade cylinder stove and surface burner with sliding feed door, hinged lower illuminating doors, sliding top and extra large base; the Penn Hope, a new sheet iron stove with extra large base, and the Penn Hope double heater with sliding register in top. The line of globe and egg stoves includes the Daisy, a new globe stove with expanded lower fire pot, consequently increased grate surface; the Charm, a new and improved square base globe stove with expanded lower fire pot, mica door and dumping and shaking grate, and the Magic, a new cheap egg stove with expanded lower fire pot, nickel foot rail, hinge pins, panels and ornament, polished edge, square base and dumping and shaking grate, and adapted to conversion into a self feeding stove by the addition of a magazine. The closing pages are occupied by the Monday, a new laundry stove with brick lined cylinder and revolving top; the Penn Tropic, single and double heater, a farmer's boiler, Radiant and Model furnaces, hollow ware, stove utensils and repairs, directions for operating stoves and remarks on chimneys. The Radiant furnaces are now made with brick linings, and the line of Model furnaces has been augmented by the addition of No. 248, an extra large size with a grate diameter of 26 inches. The catalogue is well indexed, and stubs have been placed in the binding to allow of the easy insertion of supplements.

A PLEASING INNOVATION in electric heating is shown in the office of A. L. Canfield, 284 Pearl street, New York, where an incandescent electric lamp and globe are placed inside of a Beaver Franklin, sending forth a cheerful glow and bright illumination. Mr. Canfield

reports a satisfactory business for the Danville Stove Mfg. Company, but can still fill orders for the popular new things which the company have brought out this year.

New Factory of Quick Meal Stove Company.

The Quick Meal Stove Company, St. Louis, Mo., have experienced considerable difficulty during the past season in making enough goods to keep ahead of their orders, and at one time it looked as if they would be hopelessly behind, notwithstanding their large capacity. As their business has steadily grown since its inception in 1882, they feel justified in anticipating their wants for the season of 1894. To be able to fully meet the requirements of their patrons they have decided to make an addition to their factory. The necessary plans were drawn, and about two months ago they commenced the erection of the building, which, when completed, will occupy a lot 60 x 150 feet. The structure is built of pressed brick with stone trimmings and is four stories in hight. The first floor, as represented in Fig. 1 of the cuts, will be utilized as a repair shop, and also warehouse for storing tin plates, sheet steel, bar iron, &c., while the second floor, the plan of which is shown in Fig. 2, will contain the offices and large vaults, gas stove mounting shop and work benches, together with emery wheels, drill presses and lathes. The third and fourth floors will be for the exclusive manufacture of ovens and ware for the Quick Meal stoves. The structure is built on the slow combustion plan throughout, which, in addition to a lower rate of insurance, gives them ceilings at least a foot higher than if built on the old plan, thus affording additional light and air. The ceiling is also better finished, as, instead of the clumsy looking joists, nothing but the solid 14 x 14 inch beams are used, and all the beams, flooring, &c., are dressed lumber. With 4 inch floors they have a building which is exceedingly strong, and particularly adapted to their line of manufacture. Immediately over the main entrance appears the well-known trade-mark cut in red sandstone, the work being done by a well-known sculptor. The trade mark consists of a young chicken just emerging from its shell, and as he emerges he proceeds to make a quick meal of a mosquito which, unluckily for the mosquito, happens to be in the vicinity. Immediately below the trade-mark are the letters Q. M., also cut in red sandstone. They have arranged their shipping facilities so that they will be able to load their wagons with practically no second handling of the goods, thus enabling them to ship more promptly. The building when completed will give them a capacity of 100,000 stoves a year, without pushing the plant, and

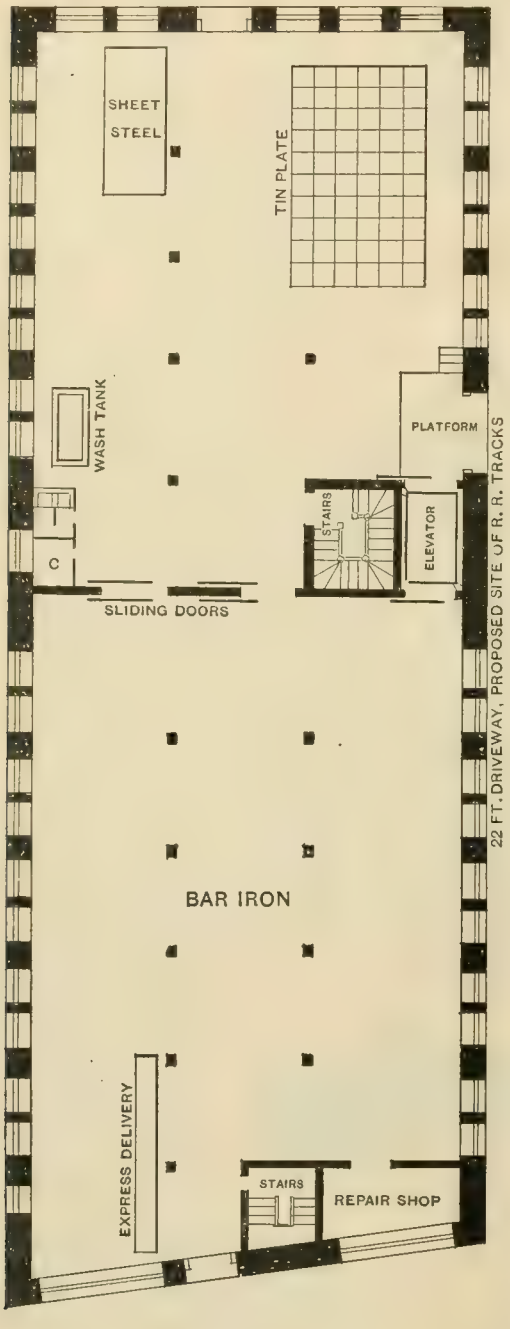


Fig. 1.—First Floor.

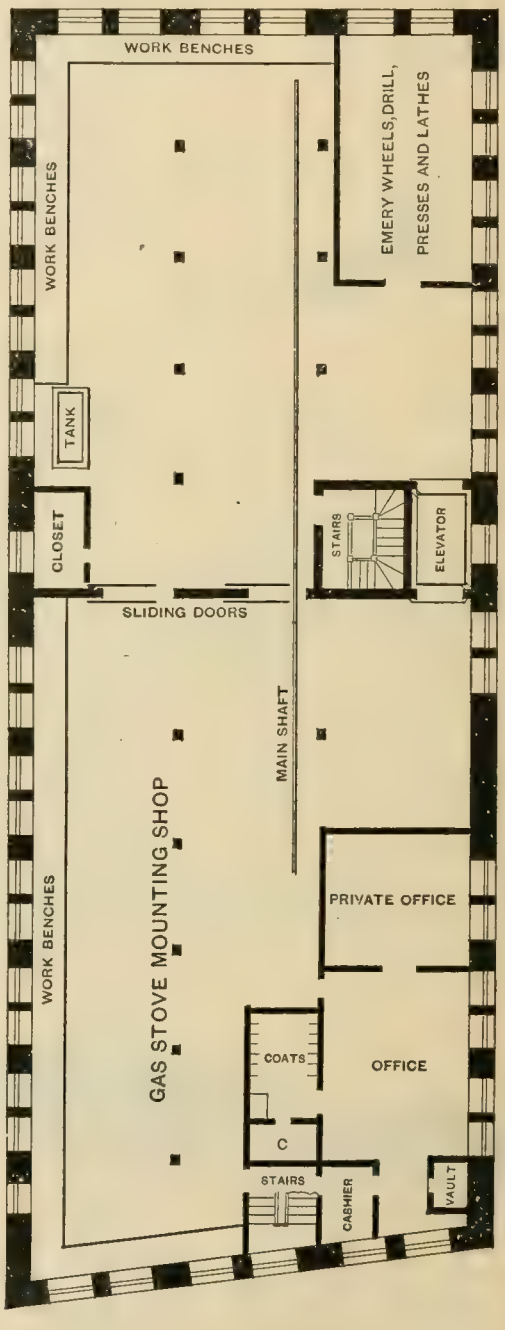


Fig. 2.—Second Floor.

NEW FACTORY OF QUICK MEAL STOVE COMPANY, ST. LOUIS, MO.

when it is taken into consideration that they sold 71,316 stoves during the present year, this capacity will be none too great for their next season's trade.

Henry Charles Burgie.

Henry Charles Burgie, one of the oldest stove manufacturers in the West, died at 7 o'clock, on the evening of the 27th ult., of paralysis, at his home, 3639 Grand Boulevard, Chicago. Since last May Mr. Burgie had been in poor health. He was suffering with heart disease, and while a very sick man he was not confined to his bed. Three weeks ago he had a stroke of paralysis, followed by another on the day before his death, from which he never rallied.

Mr. Burgie was born in Wilmington, Del., 63 years ago. In 1849 he went West and for a time lived in Milwaukee. He finally settled in Chicago in 1851 and established himself in the stove business, forming the firm of Burgie & Brown. In 1853 the partnership was dissolved, Mr. Brown withdrawing. Then a copartnership was formed under the firm name of Collins & Burgie. Mr. Burgie retired from business last year, having amassed a considerable fortune. He leaves a widow but no children.

Thus passes away the surviving partner of the old firm of Collins & Burgie, Mr. Collins having preceded Mr. Burgie in his departure from earth only about two years. They were associated in business for nearly 40 years, and during the whole of that time were almost inseparable out of as well as during business hours. So lovable were both characters, and so highly esteemed were they in their business relations, as well as by their employees, that they were frequently referred to as the Brothers Cheerybee, those admirable creations of the rich fancy of Dickens. The world does not contain so many thoroughly agreeable personalities that two such deaths will not fail to make a deep impression on all who knew them.

A Few Minutes with Rathbone, Sard & Co.

Rathbone, Sard & Co.'s foundry at Aurora, Ill., which has been running full time during October to meet the increased demand for stoves, has made a record for melting iron which is noteworthy. There is a 6-foot cupola in this foundry, built on the company's own lines and of their design throughout, in which on several different days 40 tons of iron were run off in two hours. It was not merely a spurt, which could not be repeated, but, as stated above, was done on several days. This record is believed to be unsurpassed by that of any other cupola of equal size in any stove foundry.

The company are now very busy filling orders, but trade has come so late this year that they expect the result of the season's business will be considerably under that of 1892, which, however, was an unusually prosperous year. They are now distributing illustrated circulars calling attention to some special lines of goods. One circular treats of Acorn ranges and cook stoves for burning wood only, the line comprising six and four hole ranges and three styles of cooks. Another refers to Acorn soft coal ranges and cook stoves, showing a larger line, consisting of two six-hole and two four-hole ranges and four cooks, covering all grades. A third circular covers soft coal heating stoves, in which the company have won marked success this year with their new Acorn radiator. This is practically an oak stove, built perfectly air tight, but having an ornamental open work case surrounding the inner stove, leaving an air space about 2 inches all round, properly arranged for hot air circulation. The excellent heating qualities of an oak stove are thus secured without the unsightliness of discoloration from the heat. The stove outwardly is of square shape, beautifully finished, decorated in nickel and suited in every respect for parlor use. Other soft coal heaters are the Acorn Oak, Glen Oak and Western Acorn. The fourth circular handles hard coal base burners, of which the company make a very extensive line, consisting of the Art Westminster, the Acorn Art Parlor, the Royal Acorn, the Princess Acorn, the Acorn Square Parlor in A and B series, the Avenue base burner with revertible flues or with direct draft, the Victor and the round base burner Hudson.

During the World's Fair the company distributed 100,000 of their Columbus Acorn souvenir. This is a hollow wooden acorn containing a bullet, susceptible of being rolled into such a position as to make the acorn stand on its point, in imitation of the Columbus egg. Another souvenir was an illustrated poem narrating how Columbus discovered the acorn.

G. G. Hallett.

We have the following additional particulars of the life of G. G. Hallett, whose death was noted in our columns last week. He was very prominent in the stove trade of the city, and was noted for his affable manner and genial disposition. He began his business career 35 years ago, at the corner of Water and Fulton streets, in a small cellar, and through the intervention of an old friend branched out to more pretentious quarters at 233 Water street, where he was very prosperous. After a few years, finding more room necessary, he secured the commodious store at 236 Water street, where success still followed him. He was known extensively in all parts of the world and shipping circles for his Standard ship cabooses called the Hallett. About a year ago he was stricken with a lingering illness, during which time he was tenderly watched by his wife. In her loss the trade sincerly extend their sympathies.

The funeral was very largely attended by many of the veterans, also a great many of the younger men of the trade, one and all having been very closely associated with him in business. The interment was in Greenwood.

ODD PLATES.

The Manhattan Brass Company of New York City are the assignees of a patent for a lamp stove, granted a short time ago to Thomas Hipwell of Long Island City. The invention is especially adapted to that class of lamps which are used for heating purposes and in which there is surrounding the flame, and rising above it, a heating drum provided with openings. For the purpose of preventing the heat radiating from the flame and drum down upon the floor or upon the reservoir containing the oil, the inventor makes use of a water vessel around the flame and forming the base of the heating drum itself. This is so placed as to intercept the rays of heat which may be radiated downward toward the floor, while at the same time it keeps the base of the drum cool and allows the vapor arising from the water to moisten the atmosphere of the room.

Hull, Grippen & Co, 310-312 Third avenue, New York, are running 60 men to meet the demands made upon them to put heating apparatus and stoves in order. Hull's patent hot air furnace comes in for a generous share of patronage where a new heater is required.

The John C. Jewett Mfg. Company of Buffalo, N. Y., have been assigned a patent for a vapor burner granted October 10 to William J. D. Mast of the place named. The invention relates to a vapor burner for alcohol or similar lamps, more particularly, however, to burners of this kind which are provided with auxiliary wicks for starting the vaporization of the alcohol, and a device for extinguishing the flame in the auxiliary wick. A central wick tube is provided at its upper end with a flanged cap, and below the flange with a number of perforations for the escape of the vapor. Surrounding the main wick tube below these perforations is an auxiliary wick and a vertical movable extinguishing tube, which is so placed as to bear with its upper end against the flanged cap. In using the lamp the extinguishing tube is lowered by means or its operating shaft into such a position that its upper end is below the upper end of the auxiliary wick. The latter is then lighted, which heats the perforated enlargement of the main wick tube, and the alcohol or other fluid employed is vaporized. The vapor issuing from the perforations of the main wick tube is next ignited, after which the flame from the auxiliary wick may be extinguished, as the heat produced by the burning vapor is sufficient to continue the vaporization of the fluid. The arrangement of parts is such that the auxiliary flame, or it and the main flame, may be readily extinguished by simply turning the operating shaft in the proper direction to raise the extinguishing tube.

The Rochester Radiator Company, State and Furnace streets, Rochester, N. Y., have recently taken possession of a new factory building, where they enjoy great facilities for meeting the growing demands of their business. They have added new machinery and augmented their force, so that they are now in a position to promptly meet the demands of their customers. In referring to the Rochester radiator which they manufacture they state that the system of getting directly over the current with the many cross tubes has been demonstrated to be the true one, instead of depending upon literal radiation. The construction is said to be purely scientific and commends itself to practical men who have examined it.

Southerd Robertson & Co, Peck slip and Water street, New York, are having a run on their Flag cylinder and Columbus square stoves, as a result of the cold snap.

Bridgeford & Co. of Louisville, Ky., recently had a fire in their stove warehouse that caused a loss of about $65,000, with insurance nearly covering this amount.

The New Beauty combined oil heating and cooking stove is the subject of a four-page circular, which reaches us from the Troy Oil Stove Company, Troy, N. Y. The stove is provided with central draft, the air passing up through the tank between each burner, keeping the oil cool and giving, it is

claimed, better combustion than would otherwise result. The No. 30 stove is provided with three 5-inch wicks and the No. 10 with two 4-inch wicks. The stove is well made in all its parts, and is treated with nickel plate in an attractive manner.

The Raymond & Campbell Mfg. Company of Middletown, Pa., are this season putting on the market some handsome additions to their already large line of heaters and ranges. The new heaters comprise the Perfect Franklin, an open front stove to burn hard or soft coal; the Perfect, a square heater in three sizes, and the Art Perfect, a square heater, with full reversible flue, 15 inch cylinder, full nickel base, rail, bracket and panel, and ornamental nickeled top. The ranges consist of the Grand Perfect, 1893 pattern, constructed with solid skirting, large fire box, right or left hand ovens, 18 x 20 x 13 and 20 x 22 x 14, and attractive and ornamental in appearance, and the Model Perfect, 1893 pattern, a box base range of the same size as the Grand Perfect, resembling it in appearance, but having an ash pit front. Repairs for either one of these ranges will fit the other. This, it is claimed, will be an advantage to dealers which cannot fail to be appreciated. Both have hot air attachments for heating upper rooms and have duplex grates, but their construction is such as to allow of the use of basket grates, or flat shaking and dumping grates, if required. The company are also introducing the New Capital, 1893, a redressing of the 1890 pattern, which has enjoyed an extended sale and popularity. This range has a new design of foot and solid skirting. It has also a changeable collar which can be taken off and attached to the back part, so that when required the smoke pipe may be run directly back into the flue. The company are very busy in their boiler department, the growing popularity of the Sun boiler keeping this department running at its fullest capacity. They have just made an addition to their boiler erection shop, 30 x 78, which has somewhat relieved the pressure upon space which they were experiencing, and now gives them a convenient and well lighted shop, 178 x 30.

A press dispatch from Lincoln, Neb., under recent date, is to the effect that the foundry of the Lincoln Stove & Furnace Company of that place was visited by fire and the structure entirely consumed. The building, we understand, was owned by the State, but the company will suffer considerable loss through the destruction of product and machinery.

Sam S. Utter decorated his five-story warehouse, 113 Beekman street, New York, with bunting, in honor of the repeal of the Silver bill. There were thrown to the breeze over 100 white streamers, each having upon it a miniature game cock. Mr. Utter will also celebrate the event in a social way by giving a dinner to 100 or more of his friends at the Mansion House, Brooklyn. As a result of the repeal of the Silver bill by Congress Sam expects a general revival in business, and he has his warehouse filled with stoves to supply the rush of orders.

The Smith & Anthony Company, Boston, Mass., took seven medals at the World's Fair, receiving an award for each article exhibited.

John F. Mills, treasurer of Abendroth Brothers, 109 Beekman street, has returned to New York after an absence of three weeks, spent in visiting the trade in the Western cities. He also spent some time in enjoying the beauties of the World's Fair, at Chicago.

Reports from Chattanooga Tenn., are to the effect that the Chattanooga Stove Works, which shut down the latter part of August, will soon resume operations. Manager Farrington reports that the greater portion of the stock on hand at the time of the shut down has been sold, and that as the demand for grates is heavy it will be necessary to soon resume operations.

An announcement in red ink states that five medals have been awarded by the World's Columbian Exposition on the Boston heater furnace, Boston heater combination, Magee Grand range, Kitchener double oven range and the Ideal open grate.

We are in receipt of a recent copy of the Dallas *News* of Dallas, Texas, containing an account of the visit of a number of Mystic Shriners of Galveston, Texas, to the Dallas Fair. The party were in charge of Sam Shannon, a representative of the Excelsior Mfg. Company, St. Louis, and as one of them put it, "it is not necessary for me to say any thing further than that Sam Shannon had us in charge." Mr. Shannon is one of the best known salesmen in the Southwest, and has been traveling in Texas for a number of years. His friends are legion, and during the parade of the Shriners they endeavored to have him ride the camel, but his excuse was that he had been humping himself pretty lively during the past two months in the interest of his company. Sam claims that the reason a camel can go two weeks without food is that, when a camel does eat, his food is prepared on a Charter Oak stove.

The Excelsior Mfg. Company, St. Louis, Mo., favor us with a clipping from the Columbus *Index*, printed at Columbus, Miss., and referring to the Charter Oak stove in a manner that does credit to the advertiser, who in this case is W. L. Kemp, agent at Columbus, Miss., for the Excelsior Mfg. Company. There is, it is admitted, a great deal of money wasted in newspaper advertising, but in this case if the advertisement does not pay for itself it should not be charged to the advertisement, the make up of which is especially attractive.

L. S. Brown of the Springfield Facing Company, Springfield, Mass., returned a short time ago from the World's Fair, and while there secured for his company the entire graphite exhibits of Ceylon and New South Wales. It is said that these were the largest and finest exhibits of the material named ever made in this country.

Forster Bros, proprietors of the Central Stove Works, Lebanon, Pa., are about putting their goods on the market. They have been busy since last spring getting their works into shape, with the result that they start up with a well equipped plant. Their works are situated close to two railways and a spur of the Cornwall & Lebanon Railroad passes the door of their shipping room. The main building contains four stories with five floors. The ground floor is fitted up as a machine and finishing shop and contains the engine room and business office. The second floor is the fitting department and pattern shop, while the third, fourth and fifth are reserved for storage. The molding shop is a new building, situated in the rear of the main building, 66 x 60 feet, well lighted and arranged. Their products will cover a line of stoves and heaters. They have redressed and remodeled a number of patterns obtained from the National Stove Works, Peekskill, N. Y., and are bringing out some new designs in single and double heaters. They state that they will enter the market with 12 ranges in four styles, 12 styles of globe stoves in six sizes and nine styles of square heaters in four sizes. These goods will form the nucleus of a line which they state will be fully up to the requirements of the times.

Isaac A. Sheppard & Co. of Philadelphia, Pa., and Baltimore, Md., are sending out a four-page supplement to their catalogue, descriptive of the Fidelity fire place heaters lately placed on the market by them. The heaters are made of cast iron throughout, are mounted in the best manner and have nickel base strips, foot rails, name plates, hoods, knobs and hinge pins. They have heavy fire pots, draw center grates, inside magazine covers, brick linings above fire pots, dust flues and cast iron ash pans. The frames are either highly nickeled or finished in Berlin black. They are designed to heat two rooms situate one over the other. When required to burn both hard and soft coal they are furnished without magazines, coal being supplied through the sliding fire doors. The illustrations in the supplement are of extra large size and do ample justice to the handsome designs of the heaters.

The Peninsular Stove Company's Works, at Detroit, Mich., narrowly escaped destruction by fire last Tuesday night, but the damage done was not so severe as reported in press dispatches. The fire destroyed what was known as the old mill building, in which were located the company's nickel plating, steel range and furnace departments. The manufacturing, however, will not be interfered with in any way by the fire, for the nickel work will be finished in another building, and the trade can be assured of the usual promptness in filling orders.

Casper S. Francis, a prominent resident of the Schuylkill Valley, died at his home at Spring City, Pa., on November 1, at the age of 82 years. Mr. Francis was the leading spirit for many years in different iron and other enterprises. In 1860 he entered the stove foundry firm of Smith, Francis & Wells, afterward joining that of Francis, Buckwalter & Co. In 1878 he became connected with the Francis Mfg. Company, and at the time of his death he was president of the National Bank of Spring City. He leaves a wife and two daughters. Mr. Francis was much respected in the entire Schuylkill Valley, where he possessed a large influence.

The furnace of the Tonawanda Iron & Steel Company, at Tonawanda, N. Y., will go into blast on the 13th inst.

The Bethlehem Iron Company, Bethlehem, Pa., have shipped a conning tower weighing 17 tons to the Norfolk Navy Yard for the gunboat "Amphitrite."

James A. Potter, late of the Potter & Atherton Machine Company, Pawtucket, R. I., has sailed for England, where he will enter into business in Accrington.

TRADE REPORT.

The Iron Market.

The West, which has been the leader in the decline during the greater part of this year, seems destined to take the first steps toward improvement. The low prices made have evidently attracted a good deal of business from outside quarters, and the result is that the volume of orders has increased. Thus far this has not resulted in any hardening of prices, but has had only a negative effect in stopping a further giving way.

Foundry Pig in all markets is still very dull, but there are indications that a little more work is in sight. Within the next week contracts will be let for 9000 tons of Cast Iron Pipe at Philadelphia, and for 6000 tons at Waterbury. To judge from recent sales, prices promise to be low. A small lot was sold in New York recently at $19.40, delivered in the streets, and in Detroit low prices were also made. We understand, also, that about a dozen city pumping plants are being bid on, the aggregate value being about $500,000.

How changed the financial situation is, is shown by an incident which happened a day or two ago. A firm received two checks from iron manufacturers, both anticipating payment by deducting 23 and 51 days' interest respectively.

Current business in New York is light and the market is without any strengthening tendency. The last sales of Charcoal Warrant Iron, covering 200 tons, went at a shade over $9, buyer to pay storage, which makes it equivalent to about $10. The previous sales at $3 and $1 were made in the absence of any members of the Iron trade at the Real Estate Exchange. Arrangements have now been made to conduct such sales at the Metal Exchange. We quote Northern brands $14 @ $15 for No. 1; $13 @ $14.25 for No. 2, at tidewater. Southern Iron, same delivery, $13.25 @ $14.25 for No. 1; $12.25 @ $13.25 for No. 2; $11.50 @ $12.25 for No. 3; $11.75 @ $12.25 for No. 2 Soft, and $12.25 @ $12.50 for No. 1 Soft.

From Philadelphia it is reported that, notwithstanding extremely low prices, and a surprisingly small production compared with that during the past three or four years, there is plenty of Iron, and decidedly more pressure to sell than there is to buy. This condition of affairs cannot, it is believed, last very much longer, but as the same time it is as hard to move buyers as ever it was. Prices are not quotably lower, but they are irregular, and in spots easier, particularly when there is a pressure to realize, or when spot cash or something near to it seems to be in sight. Business is mostly in small lots at prices varying from $13.75 to $14.25, delivered, for No. 1 Foundry, $13 to $13.50 for No. 2, and $12 to $12.50 for Standard Mill Irons, and for Southern No. 3 as low as $11.25 @ $11.50 has been accepted.

No improvement is noticed in the Chicago Pig Iron market. The only line in which there has been an increased business is in Lake Superior Charcoal. It is believed that within the past two or three weeks a considerable quantity of Charcoal Iron has been placed with large consumers at low prices. The only transactions which have come to light are two of 1000 tons each for delivery in this vicinity at about $15.25, on which the terms of payment run until the middle of next summer, although the Iron is to be delivered immediately. Coke Iron is quiet, only one sale of any size being reported, which was 500 tons of Soft Southern. Even the carload business is not any more active than it has been Inquiries are light. Quotations are now as follows for cash :

Lake Superior Charcoal	$15.25 @	$16.00
Local Coke Foundry, No. 1	13.50 @	14.00
Local Coke Foundry, No. 2	12.75 @	13.00
Local Coke Foundry, No. 3	12.25 @	12.75
Local Scotch	14.00 @	14.50
Ohio Strong Softeners No. 1	15.50 @	16.00
Southern Silvery, No. 1	@	14.50
Southern Silvery, No. 2	@	14.00
Southern Coke, No. 2	12.10 @	12.35
Southern Coke, No. 3	11 35 @	11.60
Southern, No. 1, Soft	12.10 @	12.35
Southern, No. 2, Soft	11.35 @	11.60
Tennessee Charcoal, No. 1	16.00 @	16.50
Alabama Car Wheel	18.50 @	18.75
Jackson County Silvery	16 50 @	17.00
Other Ohio Silvery	15 00 @	15.50

Inquiries were more plentiful during the week in the Pittsburgh district, with the result that a fair amount of Pig Iron has changed hands. Several more furnaces are reported to have started into operation, or as being on the point of doing so. Quotations are given as follows, for cash :

No. 1 Foundry	$12 50 @	$13.00, cash
No. 2 Foundry	11.50 @	12.00 "

While there has been little, if any, increase in the volume of business during the week in the Southern Pig Iron markets, there is a more confident undertone to the market. Increased inquiry for forward delivery is noted, and also less disposition on the part of furnaces to accept orders for delivery after January, except at an advance. The Iron Pipe works continue to be the largest melters of Iron, and but for them there would have been in the recent past a nearer approach to stagnation in the trade. Collections have decidedly improved and now there is little complaint of backwardness except on the part of chronic lame ducks. Quotations are as follows :

Southern Coke, No. 1	$12.75 @	$13.00
Southern Coke No. 2	10.75 @	11.00
Southern Coke No. 3	10.25 @	10.50
Ohio Soft Stone Coal, No. 1	15.50 @	16.00
Ohio Soft Stone Coal, No. 2	14.50 @	14.75
Lake Superior Coke No. 1	15.00 @	15.25
Lake Superior Coke No. 2	14.00 @	14.25
Hanging Rock Charcoal, No. 1	18.50 @	19.00
Hanging Rock Charcoal, No. 2	17.50 @	18.00
Tennessee Charcoal, No. 1	14.00 @	14.25
Tennessee Charcoal, No. 2	13.00 @	13.25
Standard Southern Car Wheel	17.75 @	18.00
Lake Superior Car Wheel and Malleable	17.00 @	17.25

Metal Market.

Pig Tin —In the price of Straits Tin there has been a decline during the past week of about ¼¢ ℔ lb. Spot stock went at as low as 20 45¢ on Metal Exchange contracts and quite as cheaply at private sale. A month ago the spot price was 21¢, bid. In the interval there has been more or less buying to "average down," with the expectation that the restriction of importations by the McKinley duty should naturally turn the tide by November 1. The speculation, however, has proved to be one of those frequent experiences wherein buyers found it easy to purchase goods, but difficult to realize profits. Steadily declining prices in London, due chiefly to heavy shipments of Tin thence from the primary sources of supply, have doubtless had a certain unfavorable bearing, but lack of local support and absence of outside speculative demand leaves the principal holders at some disadvantage. Apropos of the movement from the Straits, it is worthy of note that 1850 tons were sent to Great Britain and 200 tons to the Continent during the last half of October, and that the total shipments for the month were 3500 tons, against 3225 tons during October last year. This would indicate that the excess in European supply more than balances the decrease in American stocks. The stock in the United States, exclusive of Pacific Coast ports, is, according to the Metal Exchange data, down to 3635 tons, against 6710 tons on August 1. Prices were firmer at the close, with 20.60¢ bid for current month delivery, 20.65¢ for November and 20.75¢ @ 20.80¢ for later deliveries. Retail business is of fair proportions, prices for small quantities remaining steady and unchanged.

Copper. There have been heavy exports of Copper to Europe, and home consumers have purchased moderate quantities of Ingot through

local sales agents and brokers, the aggregate of which, while problematical, seems to have been sufficient, in connection with exports on previous orders and on consignment, to prevent really burdensome accumulation of stock in first hands. The movement has sufficed to steady values a trifle. Further than that, however, it has had no particular influence aside from holding speculative offers of futures in check for the time being, since all indications are that there will be quite enough Copper to go around during the balance of the year. Lake Superior was offered in some quarters at 9¼¢, although the leading producers quote ⅛¢ @ ¼¢ above that price. On Electrolytic the range is 9¼¢ @ 9⅜¢, and common casting stock is 9⅛¢ @ 9⅜¢, according to brand, delivery, &c. Prices for small lots are unchanged per list; and a fair average jobbing movement is noted, with rather more active inquiry from consumers both for Ingot and Sheet Copper.

Pig Lead.—Under speculative manipulation the price for common domestic Lead was raised to 3.50¢ for November and slightly higher for more distant future deliveries. Lead came out and speculative buyers at the advance went out. Prices eased off, as a matter of course, and very few contracts changed hands at the decline. Meanwhile some business was effected quietly at 3.40¢ outside of the speculative circle and the latter price fairly reflected market value at the close for carload or large lots deliverable during the next 30 days. Consumers have been very indifferent buyers of late, and their best bids are considerably below those made by speculators. At the end of the week actual Lead was on sale at 3.40¢, prompt shipment, in the face of speculative bids of higher prices for distant future deliveries. Jobbers' prices for small lots of Pig Lead have weakened somewhat, being now marked down ⅛¢ ℔ lb lower than last week. Manufactured Lead of all kinds continues in poor demand, but there has been no change in the New York list price for Pipes and Sheets.

Spelter.—The higher range of value established last week has been fully maintained, and surface indications are that sellers have gained some further slight advantage. In any event 3.60¢ @ 3.65¢ stand as close quotations on ordinary Western brands in carload or larger lots, and some few sales were reported at those figures. Dealings in this quarter have been on a rather small scale, however, and the demand at present is rather slow. For small lots of ordinary Western Spelter dealers' price is 4¼¢ @ 4⅜¢ ℔ lb. Special brands of refined Spelter command an advance of 3¢ @ 4¢. The orders and inquiries for these qualities are reported to have been more numerous during the past two weeks than for the whole of the previous six months.

Antimony.—Only a moderate business is passing, and the market shows no decided change in any particular. On moderate retail quantities the quotations are about 11¢ for Cookson's and 10¼¢ @ 10½¢ for Hallett's.

Tin Plates.—The Tin Plate market presents no distinctly new features. Although somewhat irregular, the demand for Cokes for both prompt and future delivery has been fairly active, and enough business has resulted to impart a tone of firmness, especially in certain lines of which the stock is becoming very attenuated. Bright Charcoals and Ternes have also met with fair sale, chiefly in small lots. In a few instances, where assortments are poor, prices rule a shade higher, but otherwise quotations vary hardly at all from those presented last week. Stocks of imported Plates are dwindling rapidly, and by all accounts future shipments from abroad are not likely to be much heavier than they have been in recent weeks. Importers and jobbers will not take the risk of being caught with weighty stocks should tariff changes come sooner than expected and alter existing conditions in the market for foreign Plates to any considerable extent. Consequently, dealers will not lay in more goods than they have a reasonable certainty of being able to dispose of within a limited time. Domestic production of Plates, more particularly in the line of Ternes, keeps up well, and as manufacturers are not known to be carrying any heavy stocks of American Plates, it is reasonable to infer that the consumption is keeping fair pace with the output. As a matter of fact, the demand for special brands of domestic Ternes has in more than one instance outstripped the capacity of production. In some quarters these Plates appear to have entirely superseded the foreign article.

A special cable dispatch from London to *The Iron Age*, dated November 1, reported that Tin Plate prices are that market were still rather irregular, and some business had been done on a considerable decline from late quotations. Demand is reported as chiefly for moderate quantities of ordinary Coke, and for special sizes. Stocks at Swansea had increased somewhat and were estimated at 236,000 boxes. Liverpool quotations were as follows:

IC Charcoal, Alloway grade	12/9 @ 13/3
IC Bessemer Steel, Coke finish	11/6 @ 11/9
IC Siemens " " "	11/9 @ 12
IC Coke, B. V. grade, 14 x 20	11/6 @ 11/9
Charcoal Terne, Dean grade	11/3 @ 11/6

Sheet Iron.—A better feeling is noted in the market for Black Iron, beyond the fairly active business that is passing directly between the mills and consumers. Jobbers report that inquiries are more frequent, particularly since the first of the month, and that orders received are for larger lots than has been the case for some time. Prices are fairly steady, and it is thought that any further movement in them will be an upward one. Galvanized Iron continues in good demand, consumption being believed to be at least on a par with production, if it does not exceed it.

Chicago Report.

Scrap.—Dealers are handling more Old Material now than at any time since June, and yet the volume of business can only be called moderate. Steel Scrap, however, is in no demand whatever. Old Rubber is booming, having advanced 50 per cent. the past two weeks. Dealers furnish the following list of buying prices, Chicago delivery:

	Per net ton.	Per ℔
No. 1 Wrought Scrap	$7.00	....
Machinery Cast	7.00	....
Malleable Cast	6.00	....
Stove Plate (free of burnt)	5.00	....
Burnt Iron and Grate Bars	3.50	....
Sheet Iron and Hoops	2.00	....
Plow Steel and Breaking Stock	5 50	....
No. 2, such as Shovels, Hoes, &c.	4.00	....
Old Boilers—whole (Iron)	4 00	....
" (Iron)—cut in single Sheets and Rings	6.00	....
Old Gas-Pipe and Boiler Tubes	5 00	....
Cast Borings	3 25	....
Turnings	4 00	....
Horseshoes	8 00	....
Copper Bottoms	....	5 ¢
Copper Clips and Heavy	....	7 ¢
Heavy Brass	....	5½¢
Light Brass	....	3½¢
Pipe Lead	....	2½¢
Tea Lead	....	2 ¢
Zinc	....	2 ¢
Rubber	....	3½¢

Anthracite.—Dealers report a continued heavy demand and very light stocks in yards in this locality. Much coal is being forwarded by all rail routes direct from the mines, but there is much complaint about slow deliveries. Colorado Coal prices have been reduced to Missouri River points. Carload lots of 12 net tons or over are quoted as follows:

	Grate.	Egg, Sto. and Ch.
Chicago, Ill	$5.85	$6.10
Milwaukee, Wis	5.85	6.10
Kansas City, Mo	9.05	9.30
Council Bluffs, Iowa	9 05	9.30
Lincoln, Neb	9.20	9.45
Sioux City, Iowa	9.05	9.30
Aberdeen, S. Dak	9.10	9.35
Dubuque, Iowa	7.15	7.40
Madison, Wis	7.35	7.60
St. Paul, Minn	8.35	8.60
Burlington, Iowa	7.35	7.60
Des Moines, Iowa	8.80	9.05
Davenport, Iowa	7.15	7.40
St. Joseph, Mo	9.05	9.30
Leavenworth, Kan	9.05	9.30
Omaha, Neb	9.05	9.30

Colorado Anthracite.

COLORADO FUEL & IRON COMPANY.

Denver	$8.00
Pueblo	8.00
Colorado Springs	8.00
Leadville	8.00
Cheyenne, Wyo	10.00
All points between Denver and Missouri River	8 85

WE LEARN that the Iron Clad Mfg. Company, 22 Cliff street, New York, have been awarded premiums at the World's Fair on every line of goods that they exhibited, the principal specialties being Iron Clad Enameled Ironware, Galvanized Range Boilers, riveted and welded, Tinned and Galvanized Household or Kitchen Utensils, Steel Soda Water Fountains, &c.

CONDITION OF THE

Hardware Trade.

OCTOBER BUSINESS was on the whole somewhat disappointing, having failed to come up to the more sanguine expectations of many in the trade. The month opened well, with an evident increase in the volume of business, but this increased demand fell off, and the trade of the month as a whole was only moderate, covering in nearly all cases such goods only as were imperatively required. The delay in repealing the purchasing clause of the Sherman bill is generally regarded as the cause of not a little of the curtailment of business, and now that repeal may be regarded as consummated it is anticipated that there will be the return of a more confident feeling, which will be followed, it is hoped, by a steady improvement. The business of the past month was thus considerably less than that of the average October, and fell still further behind that of last year, which was especially good. A similar comparison might be made between the four months of the current half year and the corresponding time of other years. A somewhat extended inquiry among manufacturers in regard to the way in which the business of July, August and September of this year compares with last year develops a wide diversity, all, however, agreeing that this year there has been a very material falling off in the volume of trade. Some manufacturers refer to this year's business in the three months mentioned as being about half of last year's, and in a few cases this year's proportion is still smaller. Other manufacturers advise us that their business this year is as much as 70 or 75 per cent. of last year's, but so large a proportion is not reported by any considerable number. An average figure for the business of Hardware manufacturers during July, August and September of this year, as compared with the same months of 1892, would be probably not far from 60 or 65 per cent. The amount of business of different manufacturers naturally varies largely with the character of the goods and the class of trade to whom their goods are principally sold. It is the general experience of manufacturers who sell the bulk of their goods to a few large houses that the falling off in this year's trade has been exceptionally heavy, while those who sell to a larger number of customers, including the retail trade and the smaller jobbers, have had a business more nearly normal.

There is little to report in regard to prices except the somewhat lower figures which are ruling on Wire and Cut Nails and Barb Wire, as referred to more fully in the following columns. The tone of the market, however, is not so strong as it has been, and in other lines concessions are made more freely. Some of the leading jobbing houses are also cutting prices with a view to effecting sales and thus lightening their at present not over heavy stock. Some manufacturers, also with a view to securing orders, are yielding somewhat in the matter of prices, but on the whole a conservative disposition prevails among manufacturers and prevents them from seeking business at unprofitable prices. A reduction in the price of raw material in some lines, with lower wages, enables them, however, to produce some goods at a slightly diminished cost. The production of goods in nearly all lines is largely curtailed, manufacturers avoiding the accumulation of stocks, and throughout the country, in the hands of both the wholesale and retail trade, stocks are unquestionably much lighter than usual. When the demand for goods is again vigorous there will probably be difficulty in obtaining them. Much less complaint is made of late in regard to collections, and the financial condition appears to be constantly improving.

Advices from Chicago.—Shelf Hardware jobbers report their trade very dull. The demand for season goods is over for the time, and orders now being received are for general Hardware, but in only very small lots. The country merchants are buying merely what they are absolutely compelled to take, and are keeping their stocks as low as possible. They report that they are cutting down their credits as much as they can, and keeping themselves in good financial shape for what they fear is a period of decided dullness. Jobbers here are inclined to the opinion that the coming two months will be productive of very little business in Shelf Hardware. A great deal more is doing in Heavy Hardware, but mainly in the line of Iron and Steel to the implement manufacturers. The wagon and carriage builders are still doing very little or nothing.

Notes on Prices.

Wire Nails.—The past week has developed lower prices on Wire Nails and the market is now represented by $1.25 base for carload lots at mill, but orders for large lots can be placed at $1.20. The aggregate of business has been fairly large, a good many of the trade purchasing for the replenishing of their stocks and most of the mills running, though not to their full capacity. A large sale is reported in the West at a figure somewhat below $1.20, but it is understood to have been for a lot exceptionally large for these times.

Advices from Chicago.—The Wire Nail manufacturers report a continued flow of orders. Inquiries are coming in from a fresh lot of buyers from time to time, showing that the belief generally prevails that this is a good time to stock up, with prices down to the lowest point on record. Quotations are based on $1.32½, Chicago, for largest lots from factory, and $1.40 to $1.45 for single carloads. Small lots from stock are quoted in a regular way at $1.50, but prices show a weakening tendency and good buyers can shade this rate.

Barb Wire.—The Barb Wire market is in an unsettled condition and prices are lower and weak. The market is perhaps fairly represented by the quotation of $2.15 for carload lots of Four-Point Galvanized at mill, but sales have been made at a lower figure. Some manufacturers are, however, holding at a somewhat higher price. The demand is light.

Advices from Chicago.—The Barb Wire trade seems to be getting lighter. Manufacturers talk discouragingly about the present condition of business and prospects for the winter. The factories in operation are running only on part time and even then seem to be overstocking the market. Ordinary Galvanized Barb Wire is quoted from factory $2.40 to $2.50, while 10 cents advance is asked on less than carloads. Jobbers report their trade very quiet, but quote small lots from stock at $2.55.

Cut Nails.—The weakness developed in the Wire Nail market naturally has its effect on Cut Nails, and prices are not as high or as steady as for the past week or two. The market is represented by the quotation of 95 cents to $1 basis for carload lots at mill, but sales have been made at somewhat lower figures. The production of the mills is considerably diminished, and in the East is probably not over 60 per cent. of the capacity of the mills. The New York price for small lots from store is $1.20 to $1.25.

Advices from Chicago.—The Cut Steel Nail manufacturers are doing a better trade than at any previous time this fall. Orders are coming in quite freely for carload lots and meanwhile specifications are being received in better shape from those having time contracts. Prices are unchanged at $1.20 to $1.25, while small lots from stock are still selling at $1.30.

Champion Egg Opener.—The Champion Egg Opener is put on the market by the Magic Introduction Company, 321 Broadway, New York. The device is sold to the trade at the following net prices:

	Per dozen.
Nickel plated, handsomely embossed	$2.00
Silver plated, in satin lined case	4.50

Crescent Lock Joint Stove Pipe.—This Pipe was illustrated in our last issue as put on the market by Logan, Gregg & Co., Pittsburgh, Pa., by whom it is sold to the trade at the following prices:

4-inch	$2.50	6-inch	$3.00
5-inch	2 75	7-inch	3.25

Solid Steel Putty Knife.—This article is put on the market by Chas.

J. Healy, 106 Chambers street, New York, and is sold to the trade at $1 per dozen. The Knife is nickel plated, with embossed handle.

Plumbers' Self Clamping Tacks.—Evory Mfg. Company, 21 and 23 Ann street, New York, are putting these goods on the market. The Tacks are sold to the trade from the following list, which is subject to a discount of 20 and 10 per cent. on the plain and galvanized and 20 per cent. on the nickel plated, the prices given being per 100:

Regular Pattern.

	P. I.	Galv.	N. P.
For ⅜ and ½ inch Pipe	$9.00	$10.00	$15.50
For ⅝ and ¾ inch Pipe	10.00	11.00	16.50
For 1 to 1½ inch Pipe	11.60	12.75	18.25

Single Corner Pattern.

For ⅜ and ½ inch Pipe	$9.00	$10.00	$15.50
For ⅝ and ¾ inch Pipe	10.00	11.00	16.50
For 1 to 1½ inch Pipe	11.60	12.75	18.25

Half Pattern.

For ⅜ and ½ inch Pipe	$5.00	$6.00	$9.00
For ⅝ and ¾ inch Pipe	6.00	7.00	11.00
For 1 to 1½ inch Pipe	8.00	9.00	13.00

Flush and Supply.

For ⅜ to 1½ inch Pipe	$22.50	$35.00	$50.00

Star Pattern.

For ⅜ to ½ inch Pipe	$7.00	$8.00.....
For ⅝ to ¾ " "	8.00	9.00.. .....

Glass.—In round numbers there is a capacity for the manufacture of Window Glass in this country equivalent to 1800 pots. Of these about 10 per cent., or 182 pots, are reported as now in operation. It is understood that the Workmen's Wage Committee are willing to sign an agreement for the coming fire upon the same basis as last year's scale; and are, in addition, willing to submit to a reduction equivalent to the reduction in tariff on Glass should the tariff be revised. Indiana and Pittsburgh manufacturers demand a reduction from last year's scale, and are unwilling to accede to the workmen's terms. There are no printed quotations on Glass, but a fair factory price for Window Glass in car lots is probably 85 and 5 per cent. discount for Single, and 85 and 10 per cent. discount for Double, with freight allowance. Special assortments made up by manufacturers could probably be bought for spot cash in car lots at 85 and 20 per cent. discount. Imported Window Glass is sold at from 75 and 10 and 5 to 80 and 5 per cent. discount. In Plate Glass the price depends entirely upon assortment, and prices from jobbers range from 50 and 10 and 7½ to 60 and 5 per cent. discount. Trade in all lines of Glass is quiet, with little of encouragement for the future.

Old Metals.—The market for Old Metals, other than Scrap Iron, shows no variation in the dullness which has been its characteristic feature during the past few months. Prices contine low and purchases very moderate in volume; nothing being done beyond what is absolutely necessary for bare requirements. There is a fair business doing in Scrap Iron, the demand being, however, chiefly for small lots for immediate delivery. Prices are irregular, depending largely on pressure to sell. Holders of Old Material look for improvement in the near future. Meanwhile the following quotations represent about the prices ruling in New York:

Heavy Copper	℔ lb 6¾¢
Light and Tinned Copper	℔ lb 6¼¢
Heavy Brass	℔ lb 5¼¢
Light Brass	℔ lb 4½¢
Lead	℔ lb 3¢
Tea Lead	℔ lb 2½¢
Zinc	℔ lb 2½¢
No. 1 Pewter	℔ lb 14¢
No. 2 Pewter	℔ lb 6¢
Wrought Scrap Iron....℔ gross ton	$9.00 @ $10.00
Heavy Cast Scrap.....℔ gross ton	9.00 @ 10.00
Stove Plate Scrap.....℔ gross ton	.... @ 5.60
Burnt Iron (delivered at mill) ℔ gross ton	.... @ 4.00

Old Rags, Paper, &c.—This material shows but little activity. The market for Paper Stock continues a waiting one, Eastern mills being still as a rule running on conservative lines, and being fairly well stocked up. Western Paper mills are, however, busy, and the expectation is that those in this quarter of the country will resume their normal activity so soon as a general revival of business justifies any increased output of Paper. Prices show little change from the level of the past few weeks; the following quotations being those now ruling in the New York market:

No. 1 White Rags	℔ lb 3¼ @ 3½
No. 2 White Rags	℔ lb 2¼ @ 2½¢
Mixed Rags	℔ lb ¾¢
Blues and 3ds	℔ lb 1 @ 1¼¢
Hard Sized White Shavings	℔ lb 2¼ @ 2½¢
No.1 White Book Shavings	℔ lb 2 @ 2⅛¢
No.2 White Book Shavings	℔ lb 1 @ 1⅛¢
Light Book Shavings	℔ lb ¾¢
No. 1 Mixed Shavings.	℔ lb ¾ @ 1 ¢
No. 2 Mixed Shavings	℔ lb ½ @ ¾¢
No. 1 Printed Books	℔ lb 1 @ 1¼¢
Ordinary Mixed Books	℔ lb ½ @ ¾¢
Newspapers	℔ lb 3-5¢
No. 1 Manila Paper	℔ lb ⅞ @ 1 ¢
No. 2 Manila Paper	℔ lb ⅝ @ ¾¢
Bogus Paper	℔ lb ½¢
Common Paper	℔ lb ¾ @ ½¢
Straw Chips	℔ lb ½ @ ⅝¢
Binders' Clippings	℔ lb ½ @ ⅝¢
Jute Butts	℔ lb 1½ @ 1⅝¢
No. 1 Jute Bagging	℔ lb 1 @ 1¼¢
Mixed Bagging	℔ lb ¾ @ 1 ¢
No. 2 Bagging	℔ lb ½ @ ¾¢
Hemp Twine	℔ lb 2½¢
Manila Rope	℔ lb 2½¢
Jute Rope	℔ lb 1½ @ 1¾¢
Mixed Rope	℔ lb ¾ @ ⅞¢

Old Rubber.—A very narrow market exists for this material, the following being about the prices paid for Old Rubber—New York delivery:

Car Springs, ton lots, ℔ lb.	.... @ $0.03¼
Rubber Shoes, carloads, delivered at factory, ℔ lb.	.... @ .03
Rubber shoes, less than carloads, ℔ lb	0.02¼ @ .03⅛
Large Hose, ℔ ton	.... @ 9.00
White Wringer Rolls, ℔ lb.	.... @ .04¼
White Syringes, ℔ lb.	.... @ .05

SEWER PIPE manufacturers of the Ohio Valley will, it is stated, form a combination.

Trade Notes.

MARTIN-BING COMPANY were incorporated at Albany, N. Y., this week, with a capital of $16,000, to sell Glass and Tinware at Tarrytown, N. Y. The directors are Geo. H. Martin, Robert A. Patterson and August Bing of Tarrytown.

THE GILBERT & BENNETT MFG. COMPANY, 44 Cliff street, New York, and 148 Lake street, Chicago: Three catalogues—Nos. 125, 126 and 127. The first is devoted to Screens for coal, sand, gravel, &c., Wire Cloth, Coal Dealers' Supplies and Wire Goods. A great variety of Screens is shown for use in handling coal, covering Car Screens, Yard Screens, Pocket or Shute Screens, House Screens, &c. Among these are some new constructions, specially designed to meet particular requirements. The Wire Goods shown in this catalogue consist of Fencing, Poultry Netting, Stove and Grate Guards &c. The second catalogue is entitled "Fencing and Netting," and covers these subjects thoroughly, including ornamental gates and tools for erecting, fastening and stretching Wire Fencing and Netting. The third catalogue covers Wire Goods in general, such as Flower Stands, Spark Guards, Corn Poppers, Rat Traps, Wire Cloth, Window Guards, Counter and Desk Railing, Stable Fittings, &c. All are profusely illustrated.

NICOL & Co., 55 West Washington street, Chicago: High Art Hair Tools, Hardware specialties, &c. In a catalogue, No. 17, devoted to Hair Tools illustrations, descriptions and prices are given of Nicol's Curling Iron Heater, Ætna Curling Iron Heater, and of the following Curling Irons: Cute, Moustache, Columbia, Queen, French, Favorite, Silver Tipped, Grace Darling, and Cape May; also of Electric Comb Curlers, Cape May Adjustable Wave or Crimping Iron, Lillian Russell silver tipped Crimping Iron and Cape May Pinching Iron. Catalogue No. 18 is devoted to Broom Holders, Twine Boxes, Paper Bag Holders, Wagon Jacks, Bill Files, Showcard Holders, Mail Boxes, House Numbers, Lemon Squeezers, Tourist Lamp Stove, Nut Cracks, Flag Holders, &c.

THE ELMIRA STAMPING & PAPER COMPANY Elmira, N. Y., make a specialty of Ithaca red rosin sized Sheathing Paper, put up in rolls of 500, 800 and 1000 square feet. They emphasize the point that this Paper is especially desirable for sheathing purposes.

THE CHICAGO HARDWARE SPECIALTY CO., 147 and 149 Lake street, Chicago, are handling a number of novelties in the Hardware line. Among these is the Standard Stove Mat, made of asbestos, and intended for use on oil, gas or gasoline stoves, to place directly over the flame and thus keep food from burning while cooking. It is claimed that articles which usually require constant attention and stirring to keep them from burning can be cooked without stirring by the use of this Mat. They also sell the Spery combination Grater and Slicer, illustrated in these columns some time since. They further handle the Sunol Express, which is a Tricycle with a box about 28 inches square fastened in the rear to carry merchandise. The rider sits on a Bicycle saddle on a center post and operates Bicycle pedals which propel the machine by suitable gearing connecting with the rear wheels. The machine is fitted with ball bearings and is otherwise well and durably made.

CHICAGO BRASS COMPANY, 76 Monroe street, Chicago, with rolling mill and factories at Kenosha, Wis., confine their business to the rolling of Sheet Metals and the manufacture of Organ Reeds. They advise us that they notice an encouraging increase in orders during the past few weeks.

REED & PRINCE, Worcester, Mass., manufacturers of Rivets, Burrs and Stove Bolts, have just completed a new building adjoining their old plant. The addition is built of brick 175 x 40 feet, five stories and an L, for engine and boiler rooms. The manufacture of Wood Screws, a new departure for Reed & Prince, will be begun at once.

AT A RECENT meeting of the creditors of the Youngstown Stamping Company, held in Youngstown, Ohio, who were forced into the hands of a receiver by reason of the failure of Robert L. Walker, an examination of the property was made and entire satisfaction was expressed at the manner in which operations are being conducted under the supervision of W. C. Hine, receiver. The concern are now filling large orders for oil cans and other of their products for Eastern shipment.

THE DALLAS STAMPING COMPANY, Dallas, Texas, have suffered a loss of $10,000 by fire.

GEORGE E. MERRY of the firm of Merry & Clark, Tin Plate and Metal importers, 535 West Fifteenth street, New York, has been visiting the World's Fair, where he gave particular attention to inspection of sheet metal and metal products. He was absent about two weeks and brought back with him several souvenirs.

THE BUFFALO HEATING & VENTILATING COMPANY have recently been incorporated, with a capital of $5000, for the purpose of manufacturing heating and ventilating apparatus. The directors are William F. Wendt, Henry W. Wendt and Louis F. Borchard.

HEATING NOTES.

BARKER BROTHERS, 2 Kilburn court, Newport, R. I., distribute a small illustrated pamphlet respecting the Richmond heater for steam or hot water, which they install. General and sectional views are shown of this well-known apparatus and at the close of the pamphlet are a number of testimonials from Newport householders, and references.

ON EXECUTIONS of $1270 the sheriff recently held a sale to dispose of the steam fitters' supply business of the E. E. Weymouth Company, at 484 Pearl street, New York.

THE W. H. PAGE BOILER COMPANY of Norwich, Conn., have opened an office at 484 Pearl street, New York, and carry a full sample line of the Volunteer and All Right steam and hot water boilers.

SOME OF THE MASTER STEAM FITTERS in New York report a lack of good fitters and an oversupply of helpers. The trade is busily engaged in attending the emergency cases that always rush in at the last minute, and some skilled labor could be used at this time with advantage.

THE RICHMOND SECTIONAL BOILERS will be used in the following contracts: C. M. Bailey of Rochester, N. Y., will use one in the Roman Catholic parsonage at that place; Barlow & Bailey, Plymouth, Mass., will use one for heating the Universalist Church in their town; William L. Seeley's new business block at Goshen, N. Y., will be heated by a Richmond Sectional set up by Swenton, Van Etten & Co. of Port Jervis, N. Y. A No. 55 Victor boiler is being used to heat the National Bank Building at Newburg, N. Y., by George T. Barnes of that city.

"THE GEE-WHIZ SEE HER CIR-KER-LATE" book of the Model Heating Company of New York, which was circulated so freely in the past, is now being circulated with a number of testimonials from those who have used the heater. Under the head of "Boiled Down," a number of short, expressive sentences are accompanied by the signatures of several prominent men.

W. G. FLEMING has been erecting, at Fond du Lac, Wis., a steam heating apparatus for the Northwestern Railroad by which the company will keep their cars heated during the night. A 2½-inch pipe is run from the plant to the side track where the cars are stalled. The pipe is laid down about 5 feet below the surface of the ground and is incased in sand surrounded by a wooden trough, having a dimension of 8 x 8 inches, to guard against the loss of heat during its transmission from the boiler to the cars. A similar plant is to be erected at Fort Howard for the same purpose.

THE AMERICAN RADIATOR COMPANY, 111 and 113 Lake street, Chicago, are distributing as an advertising device a paper *fac-simile* of the official ribbon given by the World's Columbian Exposition to those exhibitors whose goods have been awarded a premium. The ribbon is blue, with gold lettering. The company were awarded a premium on their radiators. The method they have taken to advise the trade of the honors won is ingenious and undoubtedly effective.

THE GURNEY HOT WATER HEATER COMPANY, 163 Franklin street, Boston, Mass., issue a postal card carrying an acrostic advertisement, the initial letters spelling the well-known name "Gurney," while the lines that they begin indicate the reasons why the Gurney hot water heaters and radiators should be used.

The bill to grant an American register to foreign built vessels has been favorably reported to the House by the Committee on Merchant Marine. The bill will probably secure the early consideration of Congress.

The Chicago, Milwaukee & St. Paul Railroad is now testing a 12-wheel passenger engine recently built under a guarantee by the Rhode Island Locomotive Works of Providence. Although in all there are 12 wheels, the machine is of ten-wheel type, six of these being drivers of unusual size for this class of locomotives—6 feet 6 inches in diameter. The total length of engine and tender is over 63 feet, the wheel base is 50 feet 6¾ inches, the driving wheel base is 13½ feet, the total weight in working order is 150,000 pounds; the weight of the tender is 75,000 pounds, the weight on the drivers is 90,000 pounds, the cylinders are 21 and 31 inches in diameter by 26 inches stroke, the heating surface covers 1788 square feet, the steel boiler has 272 tubes, the fuel capacity of the tender is 6 tons and the tank holds 4000 gallons.

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Metal and Miscellaneous Prices.

CHICAGO, NOVEMBER 2, 1893.

Tin—
Straits pigs.....23¢

Imported Tin Plates—
Charcoal Plates.—Bright.

Guaranteed Plates command special prices, according to quality.

		Per box.
Calland and Melyn Grade	IC, 10 x 14	@ $6.75
	IC, 12 x 12	@ 6.75
	IC, 14 x 20	@ 6.75
	IC, 20 x 28	@ 13.50
	IX, 10 x 14	@ 8.75
	IX, 12 x 12	@ 8.75
	IX, 14 x 20	@ 8.75
	IX, 20 x 28	@ 17.50
	DC, 12½ x 17	@ 6.50
	DX, 12½ x 17	@ 8.50
Allaway Grade,	IC, 10 x 14	@ 6.50
"	IC, 12 x 12	@ 6.50
"	IC, 14 x 20	@ 6.50
"	IC, 20 x 28	@ 13.00
"	IX, 14 x 20	@ 8.00
"	IX, 20 x 28	@ 16.00

Coke Plates—Bright.

		Per box.
Steel Coke—	IC, 10x14.14x20.	$5.75 @$5.85
	IC, 14x20.90 ℔	5.50 @ 5.60
	IC, 14x20, 100℔	@ 5.85
	10 x 20	8.75 @ 9.00
	20 x 28	11.50 @12.70
	X, 10x14, 14 x 20	@ 7.35
B.V. Grade.	IC,10x14. 14x20.	5.85@ 6.00

Charcoal Plates.—Terne.

Guaranteed Plates command special prices, according to quality.

Mansel and Dean Grades.—
IC. 14 x 20 ...@ $5.62½
20 x 28.....@ 11.25
IX. 20 x 28.....@ 14.25

Worcester Brand and equal.—
IC, 14 x 20.. 6.12½@ .....
IC, 20 x 28..12.25 @ .....
IX, 14 x 20.. 7.62½@ .....
20 x 28..15.25 @ .....

American Tin Plates.
Charcoal Plates.—Bright.

Irondale, A. A.—IC, 14 x 20.....$7.00
" " IX, 14 x 20..... 9.00
" " IXX, 14 x 20.....11.00
" " IC, 20 x 28.....14.00
" " IX, 20 x 28.....18.00
" " IXX, 20 x 28.....22 00

Florence.—
IC, 10 x 14, 12 x 12, 14 x 20..$6.75
IX, 10 x 14, 12 x 12, 14 x 20.. 8.50

Palma.—
IC, 10 x 14, 12 x 12, 14 x 20..$7.25
IX, 10 x 14, 12 x 12, 14 x 20.. 9.25
Each extra cross $2.00 and 20 x 28 double these prices.

Brilliant, Tissue Packed, IC, 14 x 20.$9.25
Royal ,extra, IC, 14 x 20..... 7.25
Merion, IC, 14 x 20..... 7.00
Almond, IC, 14 x 20..... 6.50
Mint, IC, 14 x 20..... 6.25

Coke Plates.—Bright.

Elwood.—IC, 14 x 20.....$6.00
" IC, 20 x 28.....12.50

Roofing Plates.

Arch, IC, 20 x 28.....@$11.75
Crescent, IC, 20 x 28.....@ 12.25
Crescent, IX, 20 x 28.....@ 15.25
Empire, IC, 20 x 28.....@12.50
Empire, IX, 20 x 28.....@15.50
Hickory, IC, 20 x 28.....@ 12.75
" IX, 20 x 28.....@ 15.75
Alaska (heavily coated),IC,20x28@$14.50
Alaska IX, 20 x 28.....@ 17.75
Special, IC, 20 x 28.....@ 15.50
" IX, 20 x 28.....@ 18.50
Merchant's Roofing (extra coated), IC, 20 x 28.....@$17.75
Merchant's Roofing (extra coated), IX, 20 x 28.....@$21.50
Merchant's Old Method, (extra heavily coated), IC, 20 x 28.....@$19.75
Merchant's Old Method (extra heavily coated), IX, 20 x 28.....$23.60

Irondale A :
IC, 14 x 20..... $6.25
IX, 14 x 20. ..... 7.75
IC, 20 x 28..... 12.50
IX, 20 x 28..... 15.50

Westmoreland :
IC, 14 x 20 ..... $6.25
IC, 20 x 28..... 12.50

Elwood :
IC, 20 x 28 ..... $12.00

Juno :
IC, 14 x 20..... $5.75
IC, 20 x 28..... 11.50

Illinois, Old Method :
IC, 20 x 28.....$17.00

E. L.:
IC, 20 x 28.....$12.50

Jessie :
IC, 20 x 28.....$12.00

Scott's Extra Coated, Stamped and Resquared, IC, 14 x 20 .....$9.50
Scott's Extra Coated, Stamped and Resquared, IX, 14 x 20 .....11.00
Scott's Extra Coated, Stamped and Resquared, IC, 20 x 28 .....19.00
Scott's Extra Coated, Stamped and Resquared, IX, 20 x 28 ..... 22.00
Neville, Stamped, IC, 14 x 20 ..... 6.25
" " IX, 14 x 20..... 7.50
" " IC, 20 x 28 ..... 12.50
" " IX, 20 x 28.....15.00
Taylor's Old Style, IC, 14 x 20 (Stamped and Resquard).....$9.50
Taylor's Old Style, IC, 20 x 28 (Stamped and Resquared).....19.00
Taylor's Roofing, IC, 14 x 20 (Stamped and Resquared)..... 8.25
Taylor's Roofing, IC, 20 x 28 (Stamped and Resquared).....16.50
Columbia, IC, 14 x 20 (Stamped)..... 7.25
" IC, 20 x 28 (Stamped).....14.50
Maple, IC, 14 x 20 (Stamped)..... 6.75
" IC, 20 x 28 (Stamped).....13.50
Willow, IC, 14 x 20..... 6.50
" IC, 20 x 28.....13.00
Knoxall, IC, 14 x 20 ..... 6.25
" IC, 20 x 28.....12.50
Globe, IC, 14 x 20..... 6.00
" IC, 20 x 28 .....12.00
Miami, IC, 14 x 20..... 6.00
" IC, 20 x 28 .....12.00
" IX, 20 x 28.....15.00
" (Redipped), IC, 20 x 28.....17.00

Tin Boiler Plates.

	Per box of 100 sheets.	Per box of 112 sheets.
X, 14 x 28	$13.00	$13.00
XX, 14 x 28	14.50	14.50
X, 14 x 31	14.50	15.80
XX, 14 x 31	16.50	17.50

	Per box of 56 sheets.
X, 14 x 56	29.50
XX, 14 x 56	32.50
X, 14 x 60	31.50
XX, 14 x 60	35.50

Sheet Iron—
Black.

	Common American	Refined.
Nos. 10 to 16	℔ 2 6 10¢	3 2 10¢
17 to 20	℔ 2 7 10¢	3 3 10¢
21 to 24	℔ 2 8 10¢	3 4 10¢
25 and 26	℔ 2 9 10¢	3 5 10¢
27	℔ 3¢	3 6 10¢

Russia, Planished, &c.

Genuine Russia, all numbers....13¢ net.
Patent Planished....℔ B, 9½¢ dis. 5%
Craig's Polished Sheet Steel.....8½¢

Galvanized.

Juniata or first quality.....dis. 70&5%

Copper—
Ingot.

Lake.....11¾¢ @ 12¼¢
Casting Brands.....11¢ @ 11½¢

Sheet and Bolt.

Discount, 25%.

Copper Bottoms.

Discount, 25%.

Seamless Brass and Copper Tubes.

Base price, 17½¢, Chicago, with extras according to size.

Copper, Bronze and Gilding Tube, 3¢ ℔ additional.

Brazed Brass Tubing.
(To No. 20 inclusive.)

Add freight from New York to Chicago to these prices, or 50¢ ℔ 100 ℔.

Above 5-16 inch to 3 inch inclu...35¢
Plain, above 3 inch.....45¢
Plain, 5-16 inch .....45¢
Plain, ¼ inch.....60¢
Plain, 3-16 inch.....$1.00
Plain, ⅛ inch.....$1.50
Fancy Tubing, Brass, to No. 20 incl.....43¢ ℔
Bronze Tubing, 3¢ ℔ ℔ more than Brass.....

40 @ 45%

Roll and Sheet Brass.

Discount, 35 @ 40%.

Slab Spelter—
Western Spelter.....5

Sheet Zinc—
600 ℔ casks.....5 ¢
300 ℔ casks.....5¼¢
Loose sheets.....5½¢

Lead—
Soft Pig Lead.....4¢
Bar.....4½¢
Pipe.....6½¢, dis. 10¢
Block Tin Pipe.....35¢
Sheet.....6¢, dis. 10%

Solder—
½&½.....13¢@13¼¢
Extra Wiping.....11½¢

The prices of the many other qualities of Solder in the market indicated by private brands vary according to composition.

Antimony—
Cookson.....12@12½¢
Hallett's.....11¼¢@11½¢

Wrought-Iron Pipe—
List on following page.

1¼ and under, Plain.....57½&10%
1¼ and under, Galv.....52½&10%
1½ and over, Plain.....67½&10%
1½ and over, Galv.....60&10%
Boiler Tubes, list Oct. 24, 1892...65@67½%
Casing, list Nov. 16, 1892.....52½%
Inserted Joints Casing, list Nov. 16, 1892.....47½%
Steel Boiler Tubes.....27½%
Cold Drawn Seamless Steel Tubing...50%

Cast-Iron Soil Pipe—
Cast-Iron Soil-Pipe, Tarred; sizes 2 to 6 inches, inclusive.....dis 70&2½%
Other sizes.....dis 60%

Leader Pipes—
Abendroth's Galv. Spiral Riveted.....60%
Austin's Corrugated.....60%
Gordon & Gilbert's Corrugated.....60%
Ritchie's (Galv. Iron only) Cor'd.....60%
Ritchie's Spiral Lock Seam, Galv'd....55%
Austin's Spiral Ribbed Pipe.....60%
Plain Adjustable Elbows.....60%
James A. Miller Bros. (Galv'd Iron only) Corrugated.....60%

Furnace Fittings—
Discount from Excelsior Steel Furnace Co.'s list.....50%

Steel Roofing—
Perfection.....$3.75 square
Climax.....$3.50 square
The Lloyd Spanish Tiling...$4.50 square

Metallic Shingles—
Cushman's.....$1.25 square
Merchant & Co.'s Spanish Tiles :
Copper, 14 oz.....$36.00 square
Tin.....$9.75@$14.25 square
Steel, painted.....$9.00 square

Drain Pipe—
Discount from list.....50%

Paints, Oils, &c.—
Deodorized Benzine.....7¼@8 ¢
Iron Paint, Bright Red.....℔ B, 2 ¢
" " Brown.....℔ B, 1¾¢
" " Purple.....℔ B, 2½¢
" Ground in oil, B. Red ℔ B, 6½¢
" Ground in oil, Red..℔ B, 6½¢
" Ground in oil, Brown ℔ B, 5½¢
" Ground in oil, Purple ℔ B, 6 ¢
Linseed Oil, Boiled, in bbls.....40¢
Linseed Oil, Raw, in bbls.....37¢
Mineral Paints.....2@4¢
Orange Mineral.....10½¢
Pure White Lead in Oil.....6¾@7¼¢
Dry White Lead in bbls.....6¼@6¾¢
Red Lead, American.....7@7½¢
Red Venetian, English, dry...$1.65@$1.70
Red Venetian in oil; asst'd cans, 8½¢; kegs.....7½¢
Sipe's Japan Oil, in bbls, ℔ gal.....34¢
Spirits Turpentine, in bbls., ℔ gal.. 31½¢
Asphaltum, Trinidad Refined, ℔ ton..$45
Tarred Felt, 1 Ply, ℔ 100 ℔.....$1.60
Tarred Felt, 2 Ply, ℔ roll 108 sq. feet.....$1.25
Tarred Felt, 3 Ply, ℔ roll of 108 sq. feet.....$1.70
Roofing Pitch, ℔ bbl. of 300 ℔.....$3.00

NEW YORK, NOVEMBER 3, 1893.

The following quotations are for small lots.

Aluminum—
No. 2 Grade Metal, in ton lots..℔ B, $0.75
No 1 (guaranteed to be 98 % pure and over), in ton lots .....℔ B, .90
Lots less than 1 ton, 10¢ ℔ B additional.

Antimony—
Cookson .....℔ B, 11¢
Hallett's.....℔ B, 10¼¢@10½¢

Brass—
Planished.....net
Roll and Sheet.....35@40%

Brass and Copper Tubes
Brazed Brass Tubing—
List May 20, 1889.

	Per ℔.
Plain, to No. 20 inclusive, above 5-16 inch to 3 inch inclusive	$0.35
Plain, to No. 20, above 3 inch	45
Plain, 5 16 inch to No. 20	45
Plain, ¼ inch	60
Plain, 3-16 inch	1.00
Plain, ⅛ inch	1.50
Fancy Tubing to No. 20, inclu...	43

35@40%

Copper and Bronze Tubing—
3¢ ℔ B more than brass.

Bronze, Tobin—
Drawn Rods for Bolts, Forgings, &c
Over ¼ to 3½ inches inclusive....17¢ ℔ B
Over 3½ to 5 inches inclusive.....18¢ ℔ B

Piston Rods, Finished True, Smooth and Straight.
Over ¼ to 3½ inches inclusive....18¢ ℔ B
Over 3½ to 5 inches inclusive.....19¢ ℔ B

Clips—
Buffalo Damper: Nos. 1, $1.25; 2, 2.50 per doz.....40&10%

Conductors—
Corrugated. *Round or Square—*
Galvanized 60%
Galvanized, Locked Joints.....60%
Tin.....60%

Spiral Riveted—
Galvanized 50%

See also *Elbows and Shoes; Eave-Trough Miters; Strainers, Conductor.*

Conductor Strainers—See *Strainers, Conductor.*

Copper—
Bottoms, Pits and Flats....25@25&5%

Ingot.
Lake.....11¢
Ansonia Grade Arizona.....10½¢
Ansonia Grade Casting.....10¢
Planished......net
Sheet and Bolt......25&25&5%

Tubes—See *Seamless Brass Tubes.*

Coppers, Soldering—
See *Irons, Soldering,* in Current Hardware Prices.

Damper Clips Buffalo—
See Clips, Buffalo Damper.

Eave Troughs—
Lap or Slip Joint, Galvanized.....60&10%
Lap or Slip Joint Terne.....60%

Eave-Trough Mitres—
Lap or Slip Joint.....list, net

Elbows—
Plain Adjustable—
Tin.....70%
Galvanized.....70%

Crimped Tubing—
Re-Tinned or Galvanized.....35%

Stove-Pipe—
Buffalo Four-Piece.

4½	5	5½	6	7 inch,
$0.78	.87	.90	.99	1.20 per doz..20 %

Elbows and Shoes—
Flat Crimp.
Tin.....35%
Galvanized.....35%

Corrugated.
Flat Crimp.
Galvanized.....60%

Round or Square.
Tin.....60%
Galvanized.....60%

Iron, Sheet—
Black.

	Common American.	R. G. Cleaned American.
Nos. 10 to 16	℔ B, 2¼	3 10¢
Nos. 17 to 20	℔ B, 2.85	3.10¢
Nos. 21 to 24	℔ B, 2.90	3.20¢
Nos. 25 and 26	℔ B, 3.05	3.30¢
No. 27	℔ B, 3.15	3.40¢
No. 28	℔ B, 3¼	3½¢
American B. B.	℔ B, 4¢@4½¢	

Russia, Planished, &c.
Genuine Russia, according to assortment.....℔ B, 11¾@12½¢
Patent Planished....℔ B. A, 10¢; B, 9¢, 5%
Craig Polished Sheet Steel.....℔ B, 8½¢

Galvanized.

	B. B.
Nos. 10 to 16	70&2½%
Nos. 17 to 22	70&5%
Nos. 23 to 24	
Nos. 25 to 26	
No. 27	
No. 28	
Nos. 29 and 30	

Filter Joints—
Lee's.....33⅓

Lead—
American Pig.....4¢@4½¢
Bar.....4½¢
Pipe.....6½¢, 20%
Tin Lined Pipe.....15¢, 20%
Block Tin Pipe.....37½¢, 20%
Sheet.....7¢, 20%
Old Lead in exchange, 3¼¢ ℔ B.

Metal, Expanded—
Manufacturers' list No. 5.
Lathing.....10%
Fencing, Painted Sheets.....20%
Netting, Painted Sheets.....20%
Door Mats, Galvanized.....25%
Window Guards, Paneled.....15%
Tree Guards, Paneled.....15%

Mitres Eave-Trough—See *Eave-Trough Mitres.*

Paints Oils &c.—

Lead, Amn. White, in oil	6¾ @ 7¼
Lead, Red, bbls. and ⅛ bbls	6½ @ 7
Lead, Red, kegs	6½ @ 7
Ocher, American	1 @ 1½
Red, Venetian, American	1½ @ 2½

Linseed Oil:
Raw, ₩ gal..... @ .40
Boiled..... @ .43

Spirits Turpentine:
In bbls..... @ .32

Putty:
In barrels and ½ bbls..... .01¾ @ .01¾
In tubs..... .01¾ @ .01¾
In tin cans..... .01½ @ .02¼
In bladders..... .01⅞ @ .02¼

Roofing Material, &c.:
Asphaltum, Trinidad Refined, ₩ ton..... $30.00@$35.00
Asphaltum, Rock, ₩ ton..... $14.00
Coal Tar Felt, 1 Ply, ₩ ℔..... 2¢
Coal Tar Felt, 2 Ply, ₩ roll 108 sq. ft..... $1.42½
Coal Tar Felt, 3 Ply, ₩ roll 108 sq. ft..... $1.85
Roofing Pitch, ₩ bbl..... $2.25

Pipe, Drain 50%

Pipe and Fittings, Cast Iron Soil—

Cast-Iron Soil Pipe, Tarred, sizes 2 to 6 Inches, inclusive..... 60@60&10%
Other sizes..... 55@55&10%
Cast-Iron Fittings, Tarred, sizes 2 to 6 Inches..... 60@60&10%
Other sizes..... 55@55&10%

Pipe, Spiral—

Galvanized..... 60%
Tin..... 60%

Rock and Slag Wool—

	₩ ℔	₩ cub. foot
Slag Wool, ordinary	1¼	15¢
Slag Wool, extra	4¼	38½¢
Rock Wool, ordinary	2¼	27¢
Rock Wool, extra	7¼	43½¢

Rosin—

Common and Good—Strained, Rosin, C. & D..... ₩ bbl. $1.22 @$1.25
Rosin, E. & F..... ₩ bbl. $1.45@$1.60
Rosin, G. & H..... ₩ bbl. $1.65@$1.80
Rosin, I. & K..... ₩ bbl. $2.20@$2.70
Rosin, M. & N..... ₩ bbl $3.15@$4.00

Seamless Brass Tubes..net

Shoes and Elbows—See *Elbows and Shoes.*

Slate Roofing—

According to size, f.o.b. cars, Quarry Station.

Pennsylvania:
Best Bangor, ₩ sqr..... $3.25@$4.50
Pen Argyle, ₩ sqr..... 3.50@ 4.25
Peach Bottom, ₩ sqr..... 5.00@ 6.25
No. 1 Chapman, ₩ sqr..... 4.00@ 4.65
Lehigh Slates, ₩ sqr..... 3.00@ 4.50
Vermont:
Sea Green, ₩ sqr..... 2.70@ 3.20
Purple, ₩ sqr..... 3.50@ 4.50
Unfading Green, ₩ sqr..... 3.50@ 4.00
Red, ₩ sqr..... 9.75@12.00

Solder and Soldering Fluids—

Solder—

½ & ½..... 13½@14½¢
No. 1..... 11¾@12 ¢
Prices of Solder indicated by private brands vary according to composition.

Soldering Fluids—

Concentrated Soldering Flux.
f.o.b. New York.
In barrels, ₩ ℔..... 4¢
Smaller quantities, ₩ ℔..... 5¢

Gedney's Soldering Fluid.
In carboys or barrels, ₩ ℔..... 2¢
$1.50 for carboy or barrel; money refunded when returned.

Perfection Soldering Flux.
No charge for package.
Bbls., about 500 ℔, ₩ ℔..... 3½¢
½ bbls., about 300 ℔, ₩ ℔..... 4¢
Kegs, about 110 ℔, ₩ ℔..... 4¢
75¢ extra for keg.
Kegs, about 55 ℔, ₩ ℔..... 4¢
½ dis.

Yager's Soldering Salts.
½-℔ bottles, each..... 30¢
Large quantities, per ℔..... 40¢

Spelter—

Western Spelter..... 4¼¢@4¾¢
Bertha..... 8¼¢@9¢

Spiral Pipe—See *Pipe, Spiral.*

Stove-Pipe Elbows—*See Elbows, Stove Pipe.*

Stove Polish—See *Polish, Stove.*

Stove Trucks—See *Trucks, Stove.*

Strainers Conductor—

Galvanized..... 60%

Tin, Pigs and Bars—

Banca, pigs, ₩ ℔..... 22½¢
Straits, pigs, ₩ ℔..... 22¢
Straits in bars, ₩ ℔..... 23¢

Tin Plates

American Terne Plates—

Alaska (re-squared) IC, 14 x 20	$ .00
Alderly, extra quality, IC, 14 x 20	6.37½
Allegheny, IC, 14 x 20	6 12
" IX, 14 x 20	6 38
Apollo Roofing, IC, 14 x 20	6.25
" " IX, 14 x 20	7.25
Bonus, Extra Coated, IC, 14 x 20	6.75
" " IX, 14 x 20	8.25
Buckeye, IC, 14 x 20	7.00
" IX, 14 x 20	8.25
Chicago, IC, 20 x 28	11.50
Central, IC, 14 x 20	5.37½
Climax, IC, 14 x 20	5.70
Columbia, IC, 14 x 20	7.00
Crescent, IC, 14 x 20	6.00
DeMilt's First New York, IC, 14 x 20	5.75
" First New Jersey, IC, 14 x 20	5.50
" Mohawk, IC, 14 x 20	5.50
Dunlap's Double Dipped, IC, 14 x 20	8.25
" " " IX, 14 x 20	9.50
" Domestic, IC, 20 x 28	12.00
" " IX, 20 x 28	15.00
Empire, IC, 14 x 20	6.12½
Extra Central, IC, 14 x 20	5.62½
Flag, IC, 14 x 20	5.50
Fort Pitt, IC, 20 x 28	11.00
Globe, IC, 14 x 20	5.75
Hamilton's Best Redipped, IC, 14x20	9.25
" " " IX, 14x20	10.75
Hickory (Resquared), IC, 14 x 20	6 37½
Juno, IC, 14 x 20	5.75
Kensington, IC, 14 x 20	6.75
" IX, 14 x 20	8.00
Knoxall, IC, 14 x 20	6.00
Laufman's Apollo (Resquared), IC, 14 x 20	8.12
Laufman's Apollo (Resquared), IX, 14 x 20	9.37
Leominster, Extra Coated, IC, 14x20	7.75
Lion (Stamped), IC, 14 x 20	6.25
Lula, Best Charcoal, IC, 20 x 28	12.50
" " IX, 20 x 28	16.00
Manhattan, IC, 14 x 20	7.00
Maple, IC, 14 x 20	6.50
Merchant's Old Method (Resquared), IC, 14 x 20	9.50
Merchant's Roofing (Resquared), IC, 14 x 20	8.50
McKinley, IC, 20 x 28	12.00
" IX, 20 x 28	15.00
Neville, IC, 14 x 20	6.00
" IX, 14 x 20	7.25
N. F. Old Style, IC, 14 x 20	7.50
" " " IX, 14 x 20	9.00
Old Colony, IC, 14 x 20	8.00
Optimus, Best Redipped, IC, 14 x 20	8.25
" " " IX, 14 x 20	9.50
Osceola, Hand Coated, IC, 14 x 20	8.25
" " " IX, 14 x 20	9.75
Palacio, IC, 14 x 20	5.55
Pennsylvania Old Method (Treble Coated), IC, 14 x 20	8.50
Phœnix, IC, 14 x 20	5.80
Scott's Extra Coated (Resquared), IC, 14 x 20	9.25
Scott's Extra Coated (Resquared), IX, 14 x 20	10.75
Taylor Old Style (Resquared), IC, 14 x 20	9.25
Taylor Roofing, IC, 14 x 20	8.00
Thomson's Puritan, IC, 14 x 20	5.75
Tip Top, IC (Resquared), 14 x 20	6.62
" IX " 14 x 20	7.88
U. S. Monongahela, IC, 14 x 20	6.50
U. S. Redipped, IC, 14 x 20	9.25
Venux, IC, 14 x 20	5.60
Waldo Redipped, IC, 14 x 20	7.25
Westmoreland, IC, 14 x 20	6.25
Wilkinsburg Redipped, IC, 20 x 28	16.00
" " IX, 20 x 28	19.00
Willow, IC, 14 x 20	6.25

American Bright Plates—

Almond, IC, 14 x 20	$6.25
Brilliant (Tissue Packed), IC, 14x20	9.00
Climax, IC, 14 x 20	6.50
" IX, 14 x 20	8.00
Florence, IC, 14x20	6.75
Hazel, IC, 14x20	5.87½
Linden, IC, 14x20	6.5
Merchant's Dipped, IC, 14x20	11.00
Merion, IC, 14x20	6.75
Mint, IC, 14x20	6.00
Palma Xtra, IC, 14x20	7.25
Phœnix, IC, 14x20	6.25
" IX, 14x20	7.75
Royal, Extra, IC, 14x20	7.00
U. S., IC, 14x20	7 25

Imported Terne Plates—

Charcoal.

Dean Grade.—IC, 14 x 20	@$5.50
20 x 28	@11.00
IX, 14 x 20	@ 6.75
20 x 28	@13.50
Abercarne Grade.—IC, 14 x 20	@ 5.40
20 x 28	@10.80
IX, 14 x 20	@ 6.62½
20 x 28	@13.25

Imported Bright Plates—

Charcoal.
Duty: 2.2¢ ₩ ℔.

Melyn and Calland Grade.	IC, 10 x 14	@$6.50
" "	IC, 12 x 12	@ 6.75
" "	IC, 14 x 20	@ 6.50
" "	IC, 20 x 28	@13.00
" "	IX, 10 x 14	@ 8.50
" "	IX, 12 x 12	@ 8.75
" "	IX, 14 x 20	@ 8.50
" "	IX, 20 x 28	@17.00
" "	DC, 12½ x 17	@ 6.00
" "	DX, 12½ x 17	@ 8.00
Allaway Grade.	IC, 10 x 14	@ 6.00
" "	IC, 12 x 12	@ 6.25
" "	IC, 14 x 20	@ 6.00
" "	IC, 20 x 28	@12.00
" "	IX, 10 x 14	@ 7.50
" "	IX, 12 x 12	@ 7.75
" "	IX, 14 x 20	@ 7.50
" "	IX, 20 x 28	@15.00
" "	DC, 12½ x 17	@ 5.50
" "	DX, 12½ x 17	@ 7.00

Coke.

Steel Coke.—IC, 10x14, 14x20	@$5.50
10x20	@ 8.50
20x28.11.50	@12.00
IX, 10x14, 14x20	@ 6.75
B. V. Grade.—IC, 10x14, 14x20	@ 5.50

Imported Boiler Plates.—

IXX, 14x26..(112 sheets)	@$13.38
IXX, 14x28..(112 sheets)	@ 14.50
IXX, 14x31..(112 sheets)	@ 16 00

Tinning—

Brass and Copper.....net

Tubing—

Tin..... 55%
Galvanized..... 55%

Brass and Copper.—

Standard List..... 35@40%

Troughs, Eave—See *Eave Troughs*

Trucks Stove—

Improved Lock Frame, per doz..... $15.00
Steel Lock Frame, per doz..... 18.00
Daisy Improved Pattern, ₩ doz..... 18.00

Zinc—

600 ℔ casks..... ₩ ℔ 6½¢@6¾¢
Per ℔..... 6½

MANUFACTURING.

Machinery.

The Lebanon Boiler, Foundry & Machine Company of Lebanon, Pa., successors to I. Pott & Co., are making a specialty of furnace barrows, and are meeting with much encouragement in this line. Their regular line includes boilers, engines, pumps, tanks, stacks, bells, troughs, kettles and stable fittings. They are fitting up a large brick building near their works as a machine shop and expect to have it running very shortly. This will materially increase their capacity.

A new firm, W. J. & W. E. Davison, have commenced business at 226 North Fourth street, Philadelphia, as manufacturers' agents. They will, among other lines, push the sale of Prouty's wire valve wheel.

The Harrisburg Boiler & Mfg. Company of Harrisburg, Pa., have recently shipped a 75 horse-power water tube boiler to the Fayetteville Water Works, Fayetteville, N. C.

Geo. W. Fifield, Lowell, Mass., manufacturer of engine lathes, is erecting a new steel covered shop 250 x 60 feet, with two L's, each 120 x 60 feet. The new building will be connected with the main line of the Boston & Maine Railroad by a side track.

Hereafter all machines made by the Egan Company of Cincinnati, Ohio, builders of wood working machinery, will have placed upon them a number commencing from 50,000 and then onward, so that when repairs are ordered the mere mention of the number of the machine brings forward its pattern and class, for a complete record is made of every machine that goes out.

The cast iron pipe foundries of R. D. Wood & Co., whose headquarters are at 400 Chestnut street, Philadelphia, with foundries at Millville, Florence and Camden, N. J., have been kept running steadily through the summer, the company having experienced practically no dropping off in the volume of trade until the present month. They have, however, shared with competitors the generally prevailing low prices.

The D. E. Whiton Machine Company of New London, Conn., manufacturers of gear cutters, centering machines, lathe and drill chucks, are at present running their plant four days per week, making two-thirds time with about their regular force. They do not regard the immediate outlook for business in their particular lines as very promising.

The Common Sense Engine Works of Muncie, Ind., which went into the hands of receivers some time since, will probably start up at an early date. It is stated that the stockholders and the creditors have compromised their claims, and that under the new arrangement G. Campbell Janney will be president, J. C. Johnson, vice-president, James R. Sprankle, secretary and treasurer, and Benj. F. Howell, general manager. When running to full capacity the plant employs about 200 men. It is stated that a number of good sized orders are on the books, and it is believed that the works can be successfully operated and placed on a paying basis.

The foundry of William Tod & Co., at Youngstown, Ohio, has closed down on account of lack of orders and the general depression in business. There is a probability also, it is stated, that the machine shop will close down entirely if the present conditions of trade continue.

The Ball & Wood Engine Company of Elizabeth, N. J., whose works have been running only five days a week, have resumed on full time.

The J. I. Case Threshing Machine Company of Racine, Wis., are further increasing their capacity by the erection of a new molding shop. The structure will be in the shape of two L's, 210 x 80 feet and 84 x 80 feet respectively. It will be of brick, with an iron truss roof having a span of 80 feet. Two cupolas, capable of melting 50 tons a day, will be furnished by the Detroit Foundry Equipment Company. There will be seven steel cranes, electrically driven, the same medium furnishing power to run 800 incandescent and 14 arc lights and four motors on the hoisting derrick. In every respect this new department will be in keeping with the model establishment of which it will be a part.

The machine shop of the Anderson Foundry & Machine Works, at Anderson, Ind., has been closed. The foundry and pattern department are still running with only small forces.

The Skinner Chuck Company of New Britain, Conn., have equipped their plant with additional new machinery for the manufacture of their New Model drill chuck and new improved planer chuck and face plate jaws. The company have been awarded patents on two of these, and the slight improvement in business already noted leads them to hope that the demand will soon keep them fully occupied.

The Mechanical Boiler Cleaner Company of Montclair, N. J. have been incorporated, with a capital stock of $100,000, for the manufacture of a mechanical appliance for cleansing boilers.

The plant of the Springfield Emery Wheel Company has been removed from the corner of Howard avenue and Spruce street to the corner of Water street and South avenue, Bridgeport, Conn. The present location is nearer the business center of the city, while the shipping facilities are much better than the old location afforded. The company have had enough business to keep their works going all the time and have several good orders on hand at the present time. They have recently put a new dynamo brush grinder on the market which is meeting with universal approval, while their specialty, emery wheel machinery, is being constantly improved.

The Lane & Bodley Company of Cincinnati, Ohio, are operating their plant nine hours a day with about three-eighths of their usual force of men. While the amount of business transacted is less than usually at this time, the company are seizing the opportunity to make improvements in their products, so as to be ready for the demand which they anticipate will come at an early date.

LABOR EXCHANGE.

Notices under this heading of reasonable length are inserted free of charge. Only those relating to employment are admitted. Write distinctly on one side of paper only, and do not use postal cards.

HELP WANTED.

A man who thoroughly understands GALVANIZING in all its branches; wages A1. Henry Smith, office of *The Metal Worker*, Rooms 22-24 Pickering Building, Cincinnati, Ohio. Nov. 4

A first-class TINNER; one who can do all kinds of roofing and guttering and understands something about bench work, such as making stone trimmings, competent to do all kinds of repairs in the shop; must be sober, steady and reliable. M. J. Williams, 313 Main street, Baton Rouge, La. Nov. 4

A first class, sober and industrious PLUMBER who is a mechanic; can give steady work to right man; state wages and experience. "J. O. B.," office of *The Metal Worker*, 96-102 Reade street, New York. Nov. 4

A first-class TINSMITH who can furnish some capital to manufacture coolers; write for particulars. H. W. Gazley, 138 Groton avenue, Cortland, N. Y. Nov. 4

WOOD PATTERN MAKER, first-class on stove patterns, by first of December. Sarnia Stove Company, Sarnia, Ont., Canada. Nov. 4

A first-class STOVE MOUNTER; a good, steady job for a careful and neat mounter. A. Weiskittel & Son, Baltimore, Md. Nov. 4

Two first-class SLATERS and one CORNICE MAKER. C Rabe, corner Ferry and Water streets, Hudson, N. Y. Oct. 28

NICKEL PLATER, for stove work exclusively, to do the plating and oversee the polishing; state experience, wages expected, and reference. "Ohio," Box 1028, office of *The Metal Worker*, 96-102 Reade street, New York City. Oct. 28

Two good, temperate, reliable men with some knowledge of plumbing, roofing, furnace work and jobbing; good wages; steady job for the winter. Tulley & Davis, Lowville, N. Y. Oct. 28

A man who is acquainted with the steam heating trade to act as SALESMAN for the Reversible radiator; something new; big thing for right party. Address for particulars, O. A. Hayford, 50 Belmont avenue, Jersey City, N. J. Oct. 28

First class TINSMITH and GENERAL JOBBER; strictly sober; state wages wanted. E. Powers, Frankfort, Ky. Oct. 28

SALESMAN to carry as a side line specialty in hardware and house furnishings; commissions liberal. J. C. Wood, 219 North Douglass street, Indianapolis, Ind. Oct. 28

By a representative hot air furnace manufacturing company located in central New York State, a young man to take sole charge of retail department in estimating and selling hot air furnaces in their city and suburbs; must have had experience and understand the duties of such a position; good salary position for the right man; prefer unmarried man; must give good reference as to habits; must be temperate. "W.," office of *The Metal Worker*, 96-102 Reade street, New York City. Oct. 28

SITUATIONS WANTED.

By an experienced traveling man, traveling in Pennsylvania, Ohio, Indiana, Michigan and Illinois, a good line to sell on commission to general hardware and stove dealers. "A. B. C., No. 114," office of *The Metal Worker*, 96-102 Reade street, New York City. Nov. 4

By a PLUMBER and GAS FITTER, who can also do a good job at steam and hot water fitting. "Plumber," 45 Warner street, Gloucester, Mass. Nov. 4

BOOKKEEPER, thoroughly competent young man, desires position with wholesale house. "S.," Room 9, third floor, 104 West Fourth street, Williamsport, Pa. Nov. 4

By a METAL PATTERN MAKER of 20 years' experience in locks, builders' and general hardware, iron toys and novelties; competent to take charge of pattern room. "A. H. L.," 315 State street, Bridgeport, Conn Nov. 4

As PLUMBER and STEAM, GAS and HOT WATER FITTER; 11 years' experience; can also do good tin work; situation preferred in Southern California, Mexico or the Southern States. "M. E. M.," Box 83, Unionville, N. Y. Nov. 4

By a japanner, as FOREMAN with some first-class house in the West; understands all branches of japan business on tin, iron, wood and soft metals with one coat, also all kinds of lacquers and shades to stand the press, and all shades of colors in rubber for lithographing plates to stand the press. "Japanner," office of *The Metal Worker*, 96-102 Reade street, New York City. Nov. 4

As FOREMAN in manufactory making hardware specialties, by man with six years' experience in charge of the manufacture of freezers, toys, fruit presses, tin work, &c.; best of reference. "Edwards," Box 195, Little Valley, N. Y. Nov. 4

TINSMITH, married, wants permanent job; 20 years' experience in tin, copper, brass and sheet iron; stoves, furnaces, roofing and general jobbing; country preferred. "Tinsmith," 338 Twenty-second street, Brooklyn, N. Y. Nov. 4

A steady job by a PLUMBER who can do steam and gas fitting and estimate on plans; A1 reference. P. O. Box 1195, Morristown, N. J. Nov. 4

A young TINNER of three years' experience in hardware, stove and tin store and shop wants steady job as general man; have worked on tinware, roofing and spouting; best of habits and reference. "J. H. B.," care of T. J. Reece & Co., Walkerton, Ind. Nov 4

At once, by a strictly sober and reliable young man as an all around TIN and SHEET IRON WORKER; 11 years' experience at the business; both inside and outside work; also furnace work; a first-class slate roofer and general jobber. "L.," 27 West Holiday street, Newark, Ohio. Nov. 4

By a first-class PLUMBER; one who is a good tinsmith; have had charge of shop, sober and steady; good reference. "Plumber," 40 Clark street, Burlington, Vt. Nov. 4

By a young Englishman who has had four years' experience at plumbing and some knowledge of tin roofing; position desired where he could be under instruction for a year or two. "W. M.," 324 Goodwin street, Paterson, N. J Nov. 4

By a WOOD PATTERN MAKER and CARVER in stove works; competent to make drawings; good reference given. "Pattern Maker," 685½ Mineral street, Milwaukee, Wis. Nov. 4

By a first-class TINNER; experienced on assortment, jobbing, roofing, guttering and furnace work; 25 years' experience. John Corbett, Paxton, Ill. Nov. 4

By a first-class TINSMITH, in the city or country; single. "K.," care of John Klein, 616 Fulton street, Elizabeth, N. J. Nov. 4

FOUNDRY FOREMAN of long experience desires a position where ability and faithful services will be appreciated; good record; distance no object. "Good Record," office of *The Metal Worker*, 96-102 Reade street, New York City. Nov. 4

On or off the road, by a thoroughly experienced stove, range, tinware and house furnishing goods SALESMAN; 12 years' experience; good reference from former employers. J. B. Smith, care of Bridgeford & Co., Louisville, Ky. Oct. 28

By a first-class stove PATTERN MAKER who can do any fine pattern work; also fine designing; can take work home if necessary. O. A. Jensen, 779 South Washtenaw avenue, Chicago, Ill. Oct. 28

As TINNER or HARDWARE CLERK; can do anything in the tinware line; strictly temperate and steady. P. O. Box 124, Akron, Ohio. Oct. 28

As PLUMBER, by young man, a graduate of the New York Trade School; has worked at trade one year; a good lead worker; best of references. "Plumber," Box 39, Moundsville, W. Va. Oct. 28

A middle-aged man would like a position as FOREMAN of stove foundry; I have had 20 years' experience as foreman, having handled from 50 to 100 men to good advantage; can furnish the very best references; will work for very reasonable salary. Jno. Ziegler, 139 Brown street, Dayton, Ohio. Oct. 28

By a TINSMITH and GENERAL JOBBER; good hand on roofing, ranges and furnaces; some knowledge of plumbing; city or country. "Tinsmith," care Mrs. Glener, 223 Christie street, New York. Oct. 28

To represent a factory or first-class jobbing house on the road in the West, by a thoroughly experienced nail, iron, steel, carriage and heavy hardware SALESMAN with over ten years' experience; wide acquaintance with factories and dealers from Mississippi River to Pacific Coast; unexceptional references; age 34. "W. S. B.," 76 Archer street, Denver, Col. Oct. 28

As TINSMITH and ROOFER. Herman Landasburg, 292 Delancey street, New York. Oct. 28

By a TINNER and CORNICE MAKER who can do general jobbing; some knowledge of plumbing. John J. Glass, Evansville, Ind. Oct. 28

I wish to obtain a position to travel for a good stove foundry; would make an immediate engagement, or for next year; my connection with the trade is well known and would enable me to do good work in New York, Pennsylvania, Ohio, New England or the South or elsewhere; over 20 years' in the trade. "A. J. S.," P. O. Box 126 Wickford, R. I. Oct. 28

By a METAL PATTERN MAKER who has worked in the best pattern shops in the country; can file and fit and do any kind of pattern work; an honest worker. J. M. Devore, 11 Delevan street, Auburn, N. Y. Oct. 28

By a first class SPINNER and IRON WORKER; 22 years' experience; can do wiring, beading and trimming. Charles Seider, 263 Floyd street, Brooklyn, N. Y. Oct. 28

By a WOOD and METAL PATTERN MAKER who is also a first-class wood turner and molder; can run almost any machine; generally handy. Madison Vorce, 15 Wood street, Auburn, N. Y. Oct. 28

As all around TINNER; have had 15 years' experience; can do all kinds of tin work inside and out of shop; am married man, sober and industrious; can come well recommended. H P. Powers, Auburn, Ind. Oct. 28

By a good all around TINNER in some country town; steady job preferred. C. R. Kramer, Avondale, Muncie, Ind. Oct. 28

As PLATER in general job shop or bicycle factory, by a man of 14 years' experience in polishing and plating departments; understands making and keeping silver, nickel and copper solutions, also brass and silver oxidizing; can furnish best of refereuces. H. L. Church, 159 West Washington street, Indianapolis, Ind. Oct. 28

I would like to correspond with good reliable parties who are desirous of being represented in tin plate and plumbing supplies in New York, Pennsylvania or New England States on salary or commission and expenses. Box 85, Richburg, N. Y. Oct. 28

THE METAL WORKER.

NEW YORK AND CHICAGO.

Saturday, November 11, 1893.

DAVID WILLIAMS, - PUBLISHER

BUSINESS OFFICES:

NEW YORK.....96-102 Reade Street.
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CINCINNATI.....Rooms 22-24 Pickering Building.
ST. LOUIS.....Bank of Commerce Building.
CLEVELAND.....312 The Cuyahoga.

BRITISH AGENCY: The Ironmonger, 42 Cannon street, London, England.

Warming Workshops.

A leading English journal devoted to engineering asserts—presumably of English workshops — that to warm them "is so difficult and costly" that many proprietors avow "the thing is not to be thought of." This, to an American reader accustomed to see comfortably warmed shops and factories, will seem very strange. American workmen, asked to perform work that of itself is not sufficient to keep them comfortably warm through active exercise, would be apt to make things warm for the proprietor. As what are called "*engineering workshops*," or what Americans would call "*machine shops*," were especially considered in the assertion referred to, it is possible that each of such shops not heated wastes enough steam through its exhaust to keep it warm enough without other expense for fuel; and that thus the cost of warming could be reduced to deterioration and interest on the cost of the necessary apparatus for the purpose, amounting annually to a very small sum.

Heating by Exhaust Steam.

Where non-condensing engines of considerable power are used for driving machinery there is rarely any serious obstacle to utilizing the exhaust steam for heating. This is now done successfully not only in shops, but also in large office buildings, the exhaust from elevator, pumps and engines driving the dynamos for electric lighting being used as far as it will go for heating the building, and the piping being so arranged that a part may receive the exhaust, while the remainder may take live steam. There is economy in this system not only of fuel, but of water also, as the drip from the portion heated by exhaust steam may be brought back and pumped or trapped back into the boiler, a further advantage being that with water which deposits scale its use over and over prevents rapid scaling, and the boiler may be run a much longer time without cleaning. These advantages are annually increasing the number of installments for heating by exhaust steam, all the needed appliances therefor having been produced and listed in catalogues of steam fitters' supplies.

The Man and the Machine.

There was a former time when an issue was made in the minds of working people principally in the form of "Men *vs.* Machines," and a labor saving invention was believed to be entirely antagonistic to the interests of manual labor. In mechanical processes especially brains were popularly considered a less important factor than muscle, and men clung to primitive ways because they were old, and, to their limited views, satisfactory. Happily, that time of obstinate ignorance is past, the prejudice against machines has largely abated, and the trials of inventors have taken a different form. It is probable that the triumphs of steam have so settled opposition that its competitor and possible successor, electricity, will have less to contend against. We have learned that the man and the machine are not in opposition, but are both important factors in the world of industry.

The Teaching of Machinery.

We would call attention to what may be termed the teaching of machinery, meaning the attempt to learn from its operations, if possible, a way of working which the artisan may copy to advantage. The machine, while it is on duty, so to speak, attends strictly to business, carrying on processes of construction assigned to it, whether simple or complex, in a consecutive, orderly and perhaps monotonous manner. We do not imply that the man should be a mere automaton, but that the head and the hands should both be interested. If the labor is such that the hands do it nearly independently, the head may be seeking a method of helping them. In this manner inventions are generated and the machine is made which does the work faster and better than it was previously done. In those constructive operations where the machine has not replaced the man, experience has taught that the doing of the right thing at the right time, or "machine fashion," is productive of the best results. The discipline of soldiers, which is largely effective in producing a reliable fighting machine which moves at the will of a controlling mind, is illustrative of that attention to routine and detail which the young mechanic will find a good rule to work by. The machine has come to stay, and the man must adapt himself to it, learning the lesson that undivided attention to the work in hand, with a systematic progression from start to finish, will make him successful both as a man and a machine.

The Greatness of the Fair.

It is interesting and to some extent amusing to read what various writers have to say regarding the results of the Chicago Exposition. The magnitude of that enterprise in its every aspect has been an incentive to grandiloquent speech whenever the topic has come up for discussion. It has inspired lofty utterances from those gifted in that way, and a whole tribe of followers has sprung up who vie with each other in attributing to the fair almost revolutionary influences in the arts and sciences. A curious feature about this whole performance is that the most fervid prophecies regarding the influences of certain classes of exhibits are made by people who have no practical knowledge on the subject which they assume to discuss and about which they philosophize in airy abstractions. There is no doubt that in the matter of architecture American taste has been greatly cultivated by the beauty and originality displayed in the exposition buildings and many of the State and foreign buildings. The effect of this may be seen in the future, although it is questionable whether the severe plainness of the large structures now becoming such a conspicuous feature of our leading cities is not much better suited to this utilitarian era than the florid creations of ages long past.

What it Taught.

In the matter of exhibits, however, conclusions are not so easily drawn. Never before was such a magnificent array of productions of every character brought together. While in some lines the very best was shown, this was not the case in every line. Many famous manufacturers, whose reputation is world wide, were wholly unrepresented, while their competitors shone in their absence with inferior goods. How, then, in these lines, some of which have been singled out for special praise, could the progress of the art be specifically noted and a pace set for the world to follow hereafter? It was a great show, and Chicago has won imperishable glory for the grand scale on which it was projected and the triumphant success with which the details were worked out. A great many people were given an opportunity to see more than they could have hoped to see if they were to live to the age of Methuselah with every facility for travel in their power. Perhaps invention has been stimulated and imaginative faculties have thus been quickened in a way that will be felt potently by this nation and the world in the years to come. But the fair nevertheless was a commercial enterprise, expected to be of practical benefit to the locality in which it was held, and all other considerations and influences, charming as they may be, are but secondary and subsidiary. In the light of the heroic struggle forced on the business men of Chicago to make their great enterprise a success, and in view of the narrow escape from serious dangers which might have financially wrecked them, the real lesson of the fair is that other projectors of World's Fairs must not base them on such a prodigious scale. There is but one Chicago.

Sheet Mill Progress.—I.

BY A. BEARD, CAMBRIDGE, OHIO.

Unlike other branches of the iron and steel industry, there has been no record of radical or noticeable changes in the method of rolling iron and steel sheets until recent years. In the manufacture of bars, structural shapes, plates, &c., the three high, universal or Belgian and reversible mills have almost entirely taken the place of old style two high rolls, but no one has to this date been intrepid enough to spend any very large amount of time or money in an attempt to revolutionize the old established process of making light sheets. Many improvements have been made in the manner of producing a high finish, and in a marked degree the quantity produced has been materially increased in mills devoted to the manufacture of sheets of ordinary finish, but so far as the initial process is concerned the sheet rolling industry occupies nearly the same position which it did 50 years ago. The inventions of Bessemer, Siemens and others have assisted progress in sheet mill practice and have provided means in the shape of steel billets and sheet bars for the production of sheets of first-class quality at about the same cost for which common sheets were formerly produced. Sheet mill managers have, however, combined their ideas with those of machinists and foundrymen, and as a result remarkable changes have been made in the construction of machinery.

English Practice.

Before referring to these changes in detail it is necessary to review briefly the causes leading to them. For this purpose a drawing is presented herewith to illustrate the method so long employed in English sheet mills. In English mills, Fig. 1, a stand of bar rolls is attached to each sheet mill on the outer end, and all pile rolling is done on these rolls. Muck bar piles, made sufficiently heavy to make two sheet bars of the required weight to produce sheets of a specified thickness, are charged into the pile furnace, averaging 15 to the heat. They are then passed through the bar rolls, and when drawn to the proper length are cut into two pieces at bar shears, which are operated by means of a small pair of pinions attached to the wabblers on outer end of bar rolls. On the lower pinion a lug is cast, upon which the long arm of the shear works. When cut to length, with the usual allowance for trimming after the sheets are finished, these bars are given two passes through the sand rolls, after which they are taken to the chilled rolls and are reduced to about No. 18. To accomplish this two sheets are rolled together. This completes the first part of the process, all being done without reheating. At this stage sheets are termed "singles." To still further reduce the thickness three sheets are placed together, and, after being reheated, are passed through the chilled rolls for the second time. This product is called "doubles." When sheets No. 26 to 30 gauge are required, the pack of three sheets is opened, the sides meeting each other are reversed and doubled, afterward placed in the reheating furnace for the third time, and again passed through the chilled rolls. When this work is completed sheets of No. 26 or 27 gauge are called "lattens," and lighter than this "extra lattens." Prices paid for labor are regulated on this basis. After the rolling is finished the packs are taken to jaw shears and the edges trimmed. When sheets are made of iron there is a cut of 1 inch or more taken from the edges, as the sides of the pack crack when rolled; but steel sheets preserve a more even edge, and the amount required for trimming does not exceed ½ to ¾ inch on each side of the pack. When the trimming is completed the sheets are annealed in the reheating furnace, and when cold are ready for shipment. Box annealing, or "close annealing," as the process is termed in England, is not a common practice. Fully three fourths of the sheets produced are annealed in an open furnace where the flame is allowed to come into direct contact with the surface of the sheets, the result being scale raising, red edges, burnt corners and a generally uneven appearance.*

American Practice.

In American practice all light sheets are box annealed, being placed on cast iron carriers upon which the sheets are piled, then covered with a cast or wrought iron lid, made air tight by piling sand around the bottom. This carrier and box are then drawn into the annealing furnace and heat applied. By using this method scale is not raised on the sheets—they are smooth, flat and of even color. It appears strange, from an American point of view, that the young English ironmasters do not avail themselves of this method, as it gives so much superior appearance to the sheets, but they are content to do as their predecessors did before them, a commendable trait except when competition is brisk and modern advantages necessary to success. In the matter of utilization of waste heat and the employment of power the English are very careful. Fuel is expensive. It will be noticed that a vertical boiler is attached to the sheet mill, Fig. 1. This boiler has one large central flue and two cross flues near the top. It is auxiliary to the steam plant of the establishment. The power of the engine is always used to its greatest capacity. To illustrate this, note that the jaw shear is operated by a long connecting rod attached to an eccentric on the main shaft.

It is a noteworthy fact that while importations of English sheets of iron and steel have decreased with the erection of American mills, English manufacturers make frequent purchases of American highly finished sheets for use as locomotive jackets, for lagging purposes, gas stoves and other uses where a fine appearance is required.

Labor in English and American Mills.

Comparisons of wages earned by English and American workmen have been made so often and prostituted to such base political purposes that the writer has not the assurance to present figures on this matter, but this article would not be complete without a comparison of the amount of labor performed in English and American sheet mills respectively. In English mills the crews work 12 hours each and do all the work they can in that time, taking only short intervals for meals. They commence with muck bar piles and do their own annealing. During 24 hours about 16,000 pounds of finished sheets are produced by two crews consisting of the following men:

Rollers	2
Roughers	2
Catchers	2
Furnacemen	2
Helpers	2
Prilers	2
Shearmen (using jaw shears)	2
Markers	2
Scrap Boys	2
Total	18

Compared with this, American crews only work eight hours. They commence with sheet bars already prepared for them on an independent bar mill and have no annealing to do. There are three shifts during 24 hours, which produce about 19,000 pounds of finished sheets sheared ready for the annealer. To accomplish this work the following men are employed:

Rollers	3
Roughers	3
Catchers	3
Heaters	3
Pair heaters	3
Matchers	3
Doublers	3
Shearman (using squaring shears)	1
Hold up	1
Opener	1
Scrap boy	1
Total	25

The shearman and his helpers are allowed to shear for three shifts. They work about eight hours. From this statement it will be seen that the Englishmen have much the hardest time of it for about two-thirds as much money for their work. An English mill only turns out 16,000 pounds of product to 19,000 pounds in an American mill, but it takes seven more men to do the work in America. Having discussed the method of making sheets and the result obtained in England, it is in order to notice the means used for the purpose and compare with those now employed to produce the increased product and at the same time reduce the risk of breakage and consequent stoppage to a minimum. English and American sheet mills were similar 20 years ago excepting that Americans never aspired to the luxury of a stand of bar rolls for each mill. This being the case the old "housing," "housen" or holster as it is variously called in different localities will serve to illustrate old time machinery of both countries.

The piece of machinery represented in Fig. 2 is not as antiquated as a sheet mill man might imagine upon just looking at it. It is only 20 years old, being designed in 1873 for a sheet mill now in operation. It was reinforced at its weak points in 1885 and since that time has been reordered no less than seven times to replace broken ones. All orders being from the same mill. This housing weighs about 11,000 pounds. It is what is commonly known as flat-footed. In the evolution of sheet-mill machinery this old style housing and its dovetailed bed plate are dying hard. It is not until the executor or sheriff offers this kind of machinery for sale that the massive modern housing with its V-shaped bed plate and solid masonry takes its place. The pattern of the old style housing is still in possession of a prominent firm of iron founders at Pittsburgh. It was used as late as last year and is almost a counterpart of a piece of machinery manufactured by a well-known Staffordshire, England, concern for 50 years past. The rolls used in housings of this design are 20 inches in diameter, necks 15 inches in diameter and the wabbler 11¾ inches at

* Box annealing is a common method in English and Welsh tin mills. This article refers only to mills making light sheets for galvanizing, roofing and general manufacturing purposes.

its largest part. To illustrate the difference in the strength of these rolls a sketch showing the relative sizes of the wabblers on the old style rolls and the modern 24-inch rolls is shown in Figs. 3*a* and 3*b*.

Chilled rolls, 20 inches diameter, for light sheet mills have long been considered all that was required in the way of strength in English mills, and some manufacturers in this country use rolls of that size to this day, but it is probably because they have their old housings and want to make the last penny out of the old machinery and not because they do not acknowledge the benefits derived from using heavier machinery.

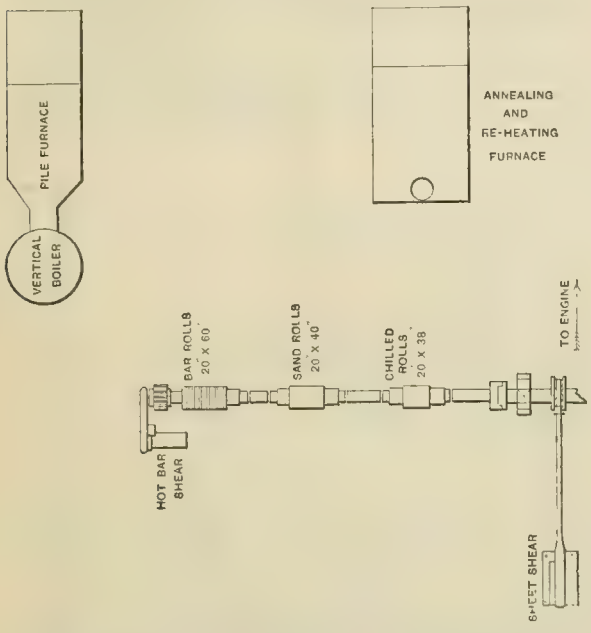


Fig. 1.—Plan of English Sheet Mill, 20-Inch Rolls. —Weight of Housings, 11,000 Pounds.

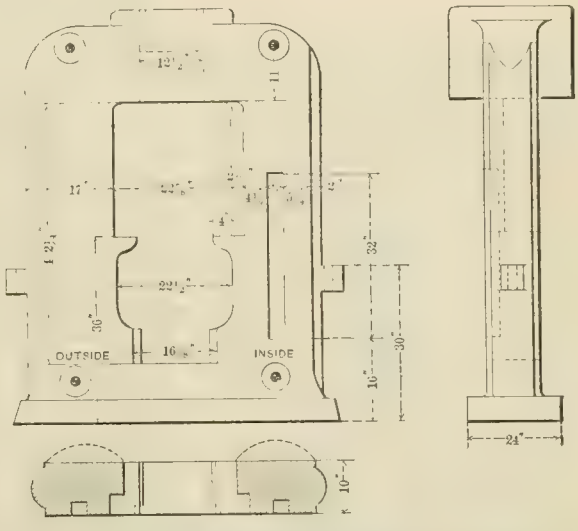


Fig. 2.—Old Style Housings, Designed 1873.—Weight, 11,000 Pounds.

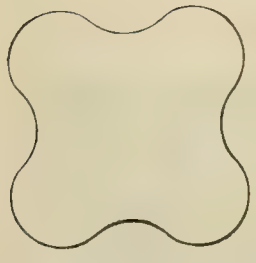


Fig. 3a.—Wabbler, English Standard 20-Inch Sheet Mill.

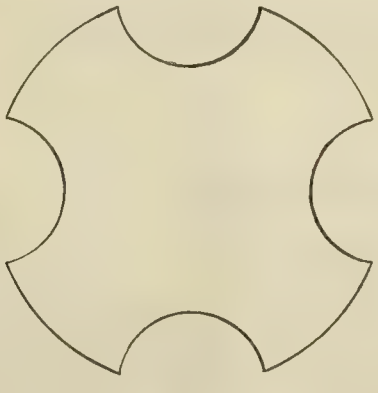


Fig. 3b.—Wabbler, American Standard 24-Inch Sheet Mill.

SHEET MILL PROGRESS.

Heavier Machinery.

The main object of American sheet-mill men appears to have been to produce the largest quantity possible and so construct the machinery that breakages become exceptions instead of a rule. A great deal has been accomplished in this direction and the means employed are worthy of notice. The illustration, Fig. 4, of an American sheet mill plant shows many points of economy. Furnaces are all set near to the railroad coal track, so that coal is unloaded directly to the bins at the sides of the furnaces. Under the coal bin shutes a narrow gauge track is laid, to convey sheet bars from the bar shears to the pair furnaces. The large and small engines are placed near together, so that only one man is needed to attend them. The small engine operates two pairs of shears, runs the machinery to raise annealing boxes and also runs the roll lathe. The annealing furnaces are near to the shears, and no material has to be handled twice. The process is progressive, from the billet furnace to the warehouse. All that has to be brought back is scrap from the sheet shears to the scrap furnace. A plant of this description would turn out 35 to 40 tons per day of sheets, from No. 18 to 30 gauge, various widths, from 20 to 36 inches.

When the agreement made between rolling mill proprietors and the Amalgamated Association of Iron and Steel Workers, increasing 8 hours' work from 105 to 135 pairs of double sheet, came into force many mill managers found that their machinery would not stand the strain. Rollers "rushed their mills," breakages came fast, and managers grew furious. As a result the output was in many instances limited to the old standard, but in many mills the diameter of sheet rolls was changed from 22 to 24 inches and the mills were then equal to the work. As a result of increased output all rolling mill builders had to make patterns for heavier machinery. The housings have been increased in size, also the rolls. A mill recently built in the Mahoning Valley was constructed in such a heavy manner that the roll trains weighed fully one half more than a roll train constructed for a similar purpose 20 years ago—viz.: rolling light sheets from No. 18 to No. 30. The housings in this mill, illustrated herewith, Fig. 5, weighed 23,000 pounds and the bed plate 1000 pounds to the foot of roll train. The mill is running successfully and if a breakage occurs it will be a matter of much surprise. Of course, chilled rolls will break as they always have done, for no one has yet found a preventive. There is fame and fortune for the man who fathoms this unexplained mystery and devises means to keep chilled sheet rolls from breaking at an unexpected moment.

If translated reports are correct, Bohemia is ahead of the United States in the uses to which steel rolls are put. In American practice cast steel rolls have long been used in bar mills, and for rolling rails, channels, I-beams and other structural shapes, but the Bohemians are credited with having used steel rolls successfully in the manufacture of sheets. An order was placed with a Chicago concern some time ago for a pair of sheet rolls to be made of steel, but for some reason or other it was never filled. Can it be that herein lies a substitute for cast iron chilled rolls of every day use, that treacherous piece of machinery, the constant and unexplained breakage of which is the bane of sheet mill managers' lives? Is there no way of hardening the surface of a steel roll so as to make it impervious to scale marks, so that it will retain a smooth surface when in use, equal, if not superior to the surface of a chilled iron roll? It has been stated that steel rolls become pitted when used, that scale adheres to them, and that they are not suitable for obtaining a fine finish on a large area. If this purpose can be accomplished, and the

common theory regarding steel rolls be proved incorrect, then chilled roll makers will lose a profitable business which only years of successful practice makes profitable, and the steel sheet roll will furnish managers with a serviceable and unbreakable piece of rolling mill machinery, and it is quite probable that one-third of the sheet rolls now made will supply the demand. Strange things have happened in the mechanical world. Why not this?

The Breaking of Rolls.

To explain more fully the trouble which sheet manufacturers who use the hot finish process have to contend with, and the exigencies which have to be allowed for in their cost accounts, a drawing is presented herewith to illustrate the degree of expansion and contraction to which sheet rolls are subjected during ordinary treatment.

The dark lines in the drawing show the shape of the rolls when heated, and dotted lines indicate the shape of rolls after they are dressed in a roll lathe ready for work, and while the roll is cold before work is commenced. The concave in these two rolls amounts to about $\frac{1}{64}$ and $\frac{1}{128}$ inch = 0.0234375. It varies according to the class of work to be performed. If wide sheets are to be rolled—*i. e.*, nearly the width of the body of the roll—the concave is made in a lesser degree than if sheets of narrow widths are to be rolled, as narrow widths will "puff up" or expand the rolls near their center quicker than wide sheets, which distribute the heat more generally throughout the body of the rolls. In the manner of turning or dressing sheet rolls custom varies; some roll turners turn one roll straight and put all the concave in the other, while others divide it between the two rolls. This seems to be a matter of opinion the correct view of which has never, if properly demonstrated, been made public.

In ordinary sheet mill practice the rolls expand after the third or fourth heat until they are nearly straight. Good rollers exercise the utmost care in starting up their mills, and endeavor to avoid breakage through warming up too rapidly, particularly in cold or frosty weather, and they will continue at all times during their work to exercise care, avoiding extremes in the rise and fall of the temperature of their rolls and giving the screw pressure in accordance with conditions, but in spite of all this care the best of rollers meet with mishaps, a report like that of a carbine is heard, the pack buckles in the rolls and the roller realizes that he has "cracked one," to use a rolling mill expression.

Probably there is not a sheet roller living to-day who has ever told how he broke a roll, and if there is common cause for it the secret is well kept. Theory has, however, provided many causes, and reasons are given which

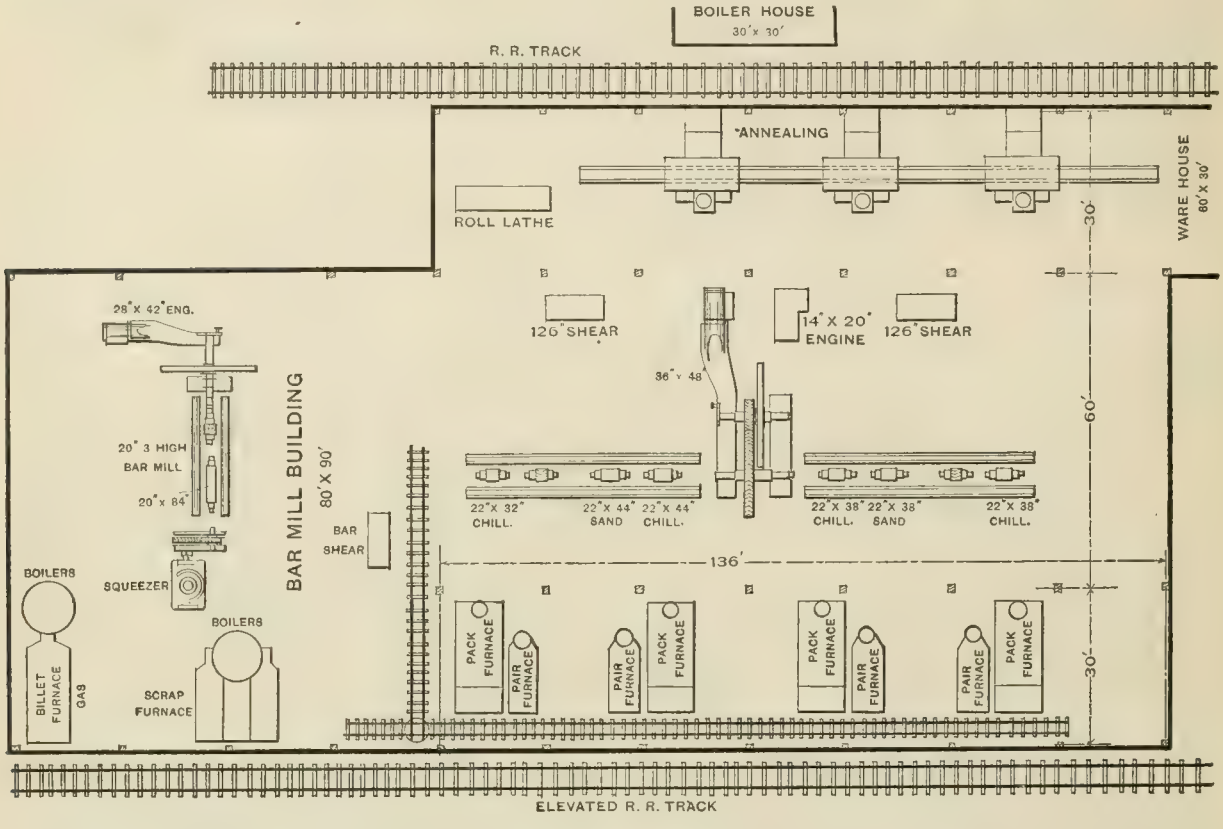


Fig. 4.—Plan of Modern American Sheet Mill.—Beard Design.—Capacity, 35 to 40 Tons per Day, No. 18 to 30 Gauge, 20 Inches to 36 Inches Width.

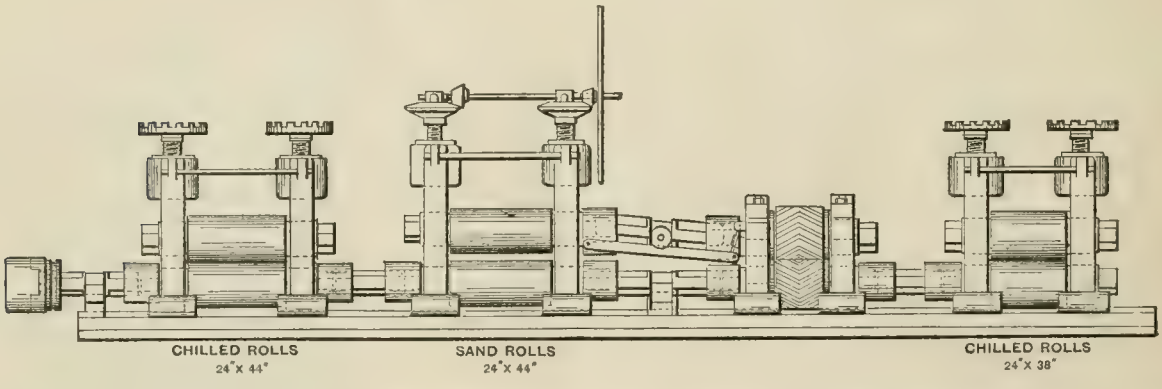


Fig. 4a.—Elevation of Modern American Light Sheet Mill, 24-Inch Rolls.—Weight of Housings, 23,000 Pounds.—Booth Design

SHEET MILL PROGRESS.

are worth consideration. Rapid expansion and excessive screw pressure are undoubtedly the two principal causes of sheet roll breaking. Upon those two causes all others rest except those attributable to machinery which is out of line, or culpable negligence, such as rolling bars not properly heated, &c. A modern sheet roll 24 inches diameter, of solid cast iron, is a massive looking affair to an outsider, and it seems incredible that they will break through their center without a moment's warning, nevertheless it is a fact. It is a trouble with which sheet mills the world over have to contend, and the proprietors are looking for a man who can find a remedy or a substitute. A cooling tube through the center has been tried without effect, and brasses having a current of water running through them were supposed to be a step toward greater safety, but rolls

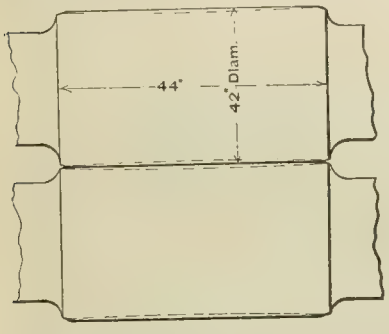


Fig. 5a.—Black Lines Show Shaping of Rolls when Hot and Expanded.—Dotted Lines Give Exaggerated View of Shape of Rolls when Cold and Contracted.

Fig. 5b.—Center of Roll, Open Grain.—Lines Show Chill, Varying from 5/8 Inch to 3/4 Inch.

SHEET MILL PROGRESS.

keep on breaking, and managers seem to have become somewhat reconciled to the no-cure theory and they devote their energy to preventing such misfortunes by training their men to exercise great care, keeping the rolls free from cold drafts of air, keeping the roll train in line, and such precautions. If a substitute is to be found it looks as though some outsider must furnish it. Can steel foundrymen do it? The writer does not say they cannot; the question is asked, not for curiosity, but for information.

The natural life of a sheet roll under ordinary wear and tear, average depth of chill, is about eight months. It is liable to be broken at any time during that period. A guaranteed life of that length would be well worth the price at which chilled rolls are now sold and a big premium attached.

A trade school connected with the Church of St. Augustine, Boston, was opened last week by Bishop Lawrence of Massachusetts. The school is intended for the instruction of American boys in various crafts in order to fit them to enter the field of skilled labor advantageously. In the course of his address at the opening Bishop Lawrence said: "This school is to sustain in this democratic country the dignity of labor. No man, however rich, has a right to live without labor. This school is also to emphasize the fact that just as much brains are needed to make a good carpenter as a good business man. It takes brains to make a box. Until our public school system is adapted to trade schools, they have got to be developed by individual philanthropy. It is not only in teaching how to make boxes, &c., that this school will achieve its full purpose, but to prove the need of trade schools as a part of our public school system."

The World's Fair Awards.

There seems to be a good deal of misapprehension concerning the World's Fair awards, which is encouraged for selfish purposes by some. A Chicago newspaper explains the system as follows:

"At most former international expositions the prize medal system has obtained. Advocates of the system followed here in Chicago say the prize medal system is faulty in that it disregards elements of excellence. Under that system an exhibit may receive a medal, yet be an inferior article. A maker of poor chocolate might receive the highest award because other chocolate makers had not made exhibits. In such a case the medal would be no guaranty of the high quality of the chocolate—merely an evidence that it was the best brand of chocolate shown; and it might be the only one shown. Under the system governing the award of medals and diplomas at the World's Fair, the several elements of excellence are all noted. For instance, a judge of furniture examines a chair. He considers that chair, not in comparison with other chairs on exhibition, but as a single chair apart from all other chairs. He notes its form, the quality of material used in its construction, the workmanship, and the character of the finish. If it be up to the standard, it receives a medal and a diploma. In the diploma the several points of excellence are set down minutely. That chair may not be the best chair in the world, but it must be a good chair, else it would not receive a medal. Its good points are all enumerated in the diploma. A medal or a diploma from the World's Columbian Exposition is, therefore, a guaranty that the exhibit which receives a medal has high merit. Only one medal goes to any exhibit, but the number of diplomas under that one medal may be indefinitely large. For instance, a watchmaker would receive only one medal for his exhibit, but he might receive a diploma for his gold watches, his silver watches, his ladies' watches, his gentlemen's watches, his hunting-cased watches and his open-faced watches.

"Under this system of awards the examination of the exhibits to determine those entitled to medals and diplomas was done by individual judges. This point also caused some friction early in the summer. The foreign exhibitors wanted to follow the European plan of having awards determined by jurors. Under the European plan, the jury on agriculture would determine all the awards for wheat, oats, tobacco, beer, condensed milk, coffee, Peruvian bark and linseed oil. At the World's Fair an expert judged each class of exhibits. A disinterested expert on wheat judged wheat, and so on through the list."

As we understand it a number of exhibits were assigned from time to time to each juror of a certain section. He made his report, which was submitted to the whole jury, of that section, and was accepted or rejected by it. There have been no "highest awards," or "first prizes," in the sense that it is usually understood. The medals are all of equal value, but the diplomas, which are based on the report of the jury, are worded in a widely different manner. They may make mention of specially meritorious points on which other diplomas given to competing goods are silent. It is the matter contained in the diploma which ranks the award.

Railway Building in 1893.

In spite of the financial stringency and general business depression of the past few months, the work of railway construction has gone on uninterruptedly in 42 of the 48 States and Territories of the Union. The *Railway Age* calculates that 2040 miles of track were laid in the first nine months of this year on a total of 182 lines, over 1000 miles having been constructed since July 1, when the panic was at its hight. There is in sight, besides, sufficient unfinished work to make the total length of new track for 1893 at least 3000 miles, but it is hardly likely, considering the number of enterprises that have been temporarily posponed by the monetary stringency, that the total for the year will much exceed 2500 miles. Yet under the extraordinarily unfavorable conditions that have prevailed of late months, this showing will be anything but a bad one. The only wonder is that construction did not altogether cease, and the fact of this substantial addition having been made to the railway facilities of the country under such adverse circumstances shows the urgency of the existing demand for additional steam transportation facilities. The only States which have not secured new tracks during the year are Vermont, Connecticut, Delaware, Maryland, Nevada and the Indian Territory.

Many in the trade will be glad to know that Webster R. Walkley of the Peck, Stow & Wilcox Company, 29 Chambers street, New York, was elected on Tuesday alderman of the city of Brooklyn, which is to be congratulated on having a man of his character and caliber in this responsible position.

Some natives of Central Africa have found a novel use for old tin cans and the tin linings of packing cases. According to a recent French official report from that region the Adamawa natives are buying up the material, which they cut up and make into saddle ornaments and rude bracelets and rings. The *Galaduna*, or Minister of War, has been seen to take the linings immediately cases have been opened, in order to have them made into plates for covering his horses to protect them from arrows. Block tin is also imported into Adamawa and made into jewelry, which is said to be highly prized.

The demand for lamps is reported as growing in China, especially for the better class of goods with metal reservoirs and improved burners. Japan is supplying the country with the cheaper qualities of lamps to a considerable extent.

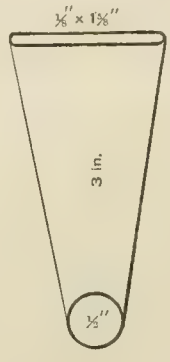
THE LETTER BOX.

Partition Flues.

From P. F., *Baltimore.*—If partition flues in furnace work are faulty who is to blame for the same, or, what is more to the point, let me ask how shall the fault in the flues be corrected? By partition flues I mean those rectangular hot air flues that run up between the studding in lath and plastered partitions, and which have come into such common use in recent years. Round flues are generally conceded to be the best shape for the purpose. Hence a 2 x 8, a 3 x 10 or a 4 x 12 flue naturally suffers in comparison. It takes but a moment's calculation to show how inadequate small rectangular flues are to carry a sufficient quantity of air to warm a given room. A round flue of diameter corresponding to the greater dimension of the rectangular flue has a capacity, in comparison with a rectangular flue, that would delight every common sense observer. The round flue would deliver a larger quantity of air at a lower temperature, consequently would not run the furnace so hard, would not wear it out so fast, and it would not consume so much fuel. Many houses are to be found—in fact, handsome residences—that are not comfortable even in mild winter weather, because their entire source of heat is a jet of superheated air thrown out from the register in the side of the room. It is not equal to overcoming the cooling effect of the bay window, nor does it add enough to the air of the room to warm the furniture and other objects. The presence of these small flues is a great injury to the furnace business. Failing utterly to heat, the furnace is condemned, or, if the fault is discovered and the blame put where it belongs, few householders are willing to go to the trouble and expense of a complete overhauling on account of these flues, and therefore they resort to some other system or means of heating. The builder and architect as a rule refuse to listen to the furnaceman, or if they do listen to him it is only to hear him out and then say: "If you don't want to work to the specifications don't bid on the job. Other men are willing to do the work without interposing conditions such as you are talking about." It may also be suggested that the house is being built for sale, and not to be occupied by the owner, and therefore it is not necessary to enter into these fine points. It becomes true, then, that the man who is to finally own and occupy the house will be compelled to invest a considerable amount of money in putting in a larger furnace than is provided by the builder, or else tearing out the flues and rebuilding them.

Bunsen Burners.

From P. B. S., *St. Louis.*—While talking with a gas engineer recently some Bunsen burners were exhibited that were used by a French manufacturer and great claims were made for their efficiency based on the flame surface exposed, which is double the usual amount. Ordinarily Bunsen burners are cylindrical in form throughout, and a ½-inch cylinder has an area of about ⅛ square inch and presents a flame surface but slightly in excess of its circumference, or about 1⅝ inches. The hight varies, but about 3 inches is an average. The burner exhibited was shaped as shown in the illustration, being ½ inch in diameter at the bottom and 3 inches high, tapering from a circle at the bottom to a slot ⅛ inch wide and about 1⅝ inches long at the top. This gives a flame surface of over 3 inches, or about double what is exposed by a cylinder



Bunsen Burners.

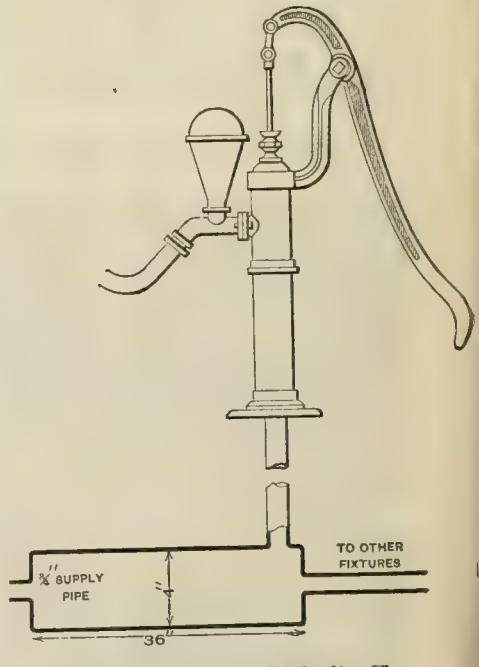
of the same area and using the same quantity of gas. A better mixture of the air and gas seemed to be secured and the flame burned with a nearer transparent blue. An iron rod of the same diameter placed over a burner of each construction was heated much quicker over the oblong burner, though the flame was not so high. The oblong burner seemed more delicate in operation and required more precise adjustment, for when the quantity of air was reduced too much the flame became red, yellow or white. When burning at the best efficiency it seemed more susceptible to the influence of a small increase of air and would light back to the gas supply with greater facility than the circular burner. However, the advantages are claimed to greatly exceed those of a circular burner and no difficulty is experienced in their use by those who have tried them.

A Remedy for Noisy Boilers.

From L. D. N., *Washington, D. C.*—In visiting the kitchens of several private houses recently I have been very much struck by the number of cases (owing to the improper setting of the boiler, the undue size of the water back or some other adequate cause) in which the boiler makes a tremendous noise — rattling and rumbling. It seems to me that this is a defect that could be easily overcome if the manufacturers and plumbers would give some little heed to it, and there is no doubt that it would be very much appreciated by the average householder, the terrific racket in his kitchen being more than an ordinary nuisance. The number of cases, however, where the pipes connecting the water back and boiler are sagged or run so as to form traps is very great, and the size of the pipes is often very small. I would like to get the opinion of the readers of *The Metal Worker* on this interesting topic, and in the first place I want to know what is the objection to setting the boiler above the water back so that the bottom of the boiler would be higher than the top of the water back? In that way there can be an easy incline for both of the pipes. Another question I have to ask of the manufacturers and plumbers, who are interested in such work, is what object is gained by making the circulating pipe so small? What harm is there in using 2 or 2½ inch pipe? Will it not, in fact, give a much better job? It will reduce the friction in the pipes and ought, I think, to give better results in heating the water. The extra cost for the larger size of such a short length of pipe would not be very great and the customer would in many cases be glad to pay the difference if he were assured of a better supply of hot water and more especially if it would assist in reducing the noise. The second is a point for the plumber to consider, after the manufacturer has made arrangements for connections of the larger size, but the first point—namely, the hight and size of the boiler—comes entirely within the province of the manufacturer. A shorter boiler of larger diameter would furthermore have a less radiating surface to the volume of water. The public are growing very critical of work, and imperfections that were put up with ten years ago must now be overcome or serious complaints will follow.

Overcoming a Pump Difficulty.

From L. M. W., *Delaware, Ohio.*—In using a pump on the supply pipe from the water main, to fill a tank to feed



Overcoming a Pump Difficulty.

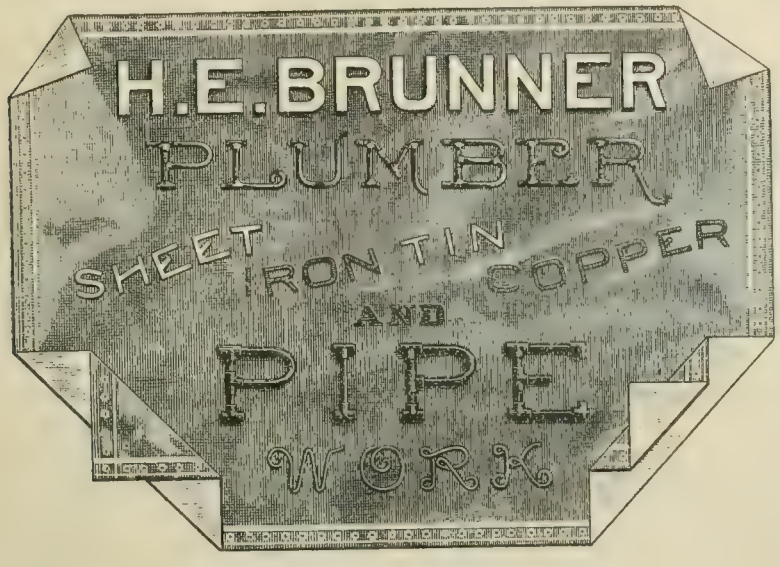
fixtures that the pressure from the main was not strong enough to reach, I have had some trouble. The pump would act as if the supply was short, and only throw a small quantity of water at each stroke, though taps on a level with the pump supply showed a good flow. After trying various expedients a reservoir on the supply pipe, as shown in the sketch, was found a perfect remedy.

PLUMBING and GAS FITTING.

A Noteworthy Sign.

We have an entertaining letter from H. E. Brunner, Haywards, Cal., from which we quote as follows:

"The cut of G. E. Meyer & Son's window display sign in *The Metal Worker* of October 7 prompts me to send a photograph of one I constructed during slack times last winter, thinking some of my brother chips might have idle time on their hands and would like to do similar work, for the sign I send has certainly attracted very considerable attention locally. The description in brief is as follows: The name is made of sheet zinc ½ inch deep, polished edges, invisible joints and scroll burnished faces. The word 'plumber' is made of lead rods with wiped joints, thus representing that craft, and the words 'sheet,' 'iron,' 'tin,' 'copper' and 'and' are made of galvanized iron, Russia iron, tin, copper and brass respectively, cut out of sheet, flat and burnished. The word 'pipe' is of ⅛-inch pipe and fittings. The word 'work' is made of blued steel, brass, copper and tinned wire. The whole is mounted on a background of zinc oxidized with acids and with lines and spots cut in the margin with emery flour, the corners being folded, showing portions of the polished reverse side of the plate. The letters are fastened by means of small brass strips, soldered to them and clinched to the plate."



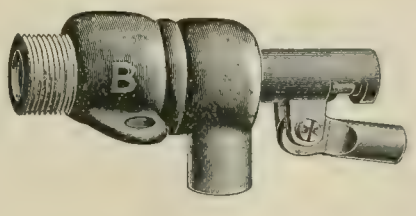
A Noteworthy Sign.

The photograph sent by our correspondent is of the sign resting on top of a barrel and supported by the designer, whose face shows above it. It was our first wish to reproduce the whole photograph by a process engraving, so that we might show the sign and its manufacturer together, but, unfortunately, the lettering on the sign showed so faintly in the photograph that it would have been all blurred in printing, and we were forced, to our regret, to adopt another style of engraving. We cannot forbear quoting the latter part of our correspondent's letter, which bears upon this subject, though we do not think it would find general indorsement if the photograph had been reproduced. The letter closes as follows:

"The mug surmounting the sign in the photograph might not be considered a good ad. in some localities, but some of my neighbors claim to have used it with success in ridding their premises of rats and other vermin."

Birkery High Pressure Ball Cock.

The accompanying engraving represents the Birkery high pressure ball cock, manufactured by the Birkery Mfg. Company, Hartford, Conn., and which was patented last year. It is a balanced ball cock constructed to provide a simple and cheap cock, having a valve which is so balanced as to open gradually with and shut easily against the pressure of the water, whereby a large port may be employed and the cock used under high pressure. The operation of this device is described as follows: When the water in the tank rises to the predetermined level, the float and its lever pushes in the spindle and closes the valve. This movement is aided by the pressure of the water upon the piston, which is forced into the chamber. Air enters and escapes back of the piston through a small outlet, as will any water that may leak past. This construction permits the use of a large port with a correspondingly large valve, which is adjusted to prevent singing or hammering, as the piston aids in the operation of closing. A large valve, it is said, may be seated firmly against the flow of high pressure without the use of a large float.



Birkery High Pressure Ball Cock.

The Inventor of Gas Lighting.

William Fletcher of London, in an article in the *Engineering Magazine*, gives the following entertaining account of the inventor of gas lighting:

Amid the bustle and confusion of these high-pressure times, we, who are reaping the innumerable benefits which have been dearly bought and handed down to us by our predecessors, seldom stop to think of those who have rendered such services in the past. Yet there are hundreds of souls who have lived and labored, leaving the works of a useful career as their eternal legacy, whose biographies can never be written; and the names even of these worthies will never be known. Such has been the fate of men who have lived in the past, and such is likely to be the lot of many who are living at the present time. Among those who are doing the greatest service, and in return receive the smallest amount of recognition, we think the faithful assistants of our great engineers claim a place. Some writer has said: "Many engineers owe their reputation to the unacknowledged skill of the assistants whom they had the good fortune to enlist."

The name of James Watt has been honored without limit, which has our approval, but we must bear in mind that Watt was always surrounded with clever assistants, and we believe that very much of the fame and wealth that fell to his lot was largely owing to the excellent coadjutors who rendered energetic and valuable services during the whole of his business career. The foremost place in that honorable rank we must assign to William Murdock, who for upward of half a century was Watt's most skillful and esteemed assistant. Watt has had numerous biographers; Murdock has not one. He is one of the many patriarchs of mechanical engineering whose services have never been adequately recognized. Not only is Murdock's ingenuity nowadays rarely mentioned in connection with Watt's carear, but some of this clever assistant's inventions have recently been erroneously attributed to Watt.

In order to celebrate the centenary of the invention of gas lighting, and to help in some measure to place W. Murdock in his true position among the illustrious inventors and engineers of the past, we may make a rapid survey of his leading inventions, allowing his experiments in gas lighting to claim our chief attention. It has often been predicted that this system of illumination is doomed to give place to its more brilliant rival, the electric light, but in spite of these prophecies gas lighting appears to be holding its own; while the manufacture of coal gas is cer-

tainly on the increase, owing to its almost universal adoption for cooking and household heating purposes, to say nothing of the enormous consumption of gas by the thousands of gas engines that are used for all manner of industries.

William Murdock was born at Bellow Mill, near Old Cumnock, Ayrshire, Scotland, in 1754. His father carried on the business of miller and millwright, and also occupied a farm on the estate of the Boswell family of Auchinleck, by whom he was much esteemed for his integrity and ingenuity.

During Murdock's earliest years he worked with his father, under whose tuition he quickly obtained a considerable amount of technical knowledge, and gained a reputation for intelligence and skill of no ordinary kind. The father and son between them constructed a wooden horse worked by mechanical power, on which young Murdock traveled about for miles around the neighborhood of his native place, to the amazement of the inhabitants. Before Murdock was 20 years of age he designed and erected a handsome bridge over the river Nith, in Dumfriesshire, which still exists. As he was anxious to improve his position, and to become something more than a country mason and mechanic, he left Scotland in 1777 with the intention of seeking work from Boulton & Watt, at Soho. Upon his arrival in Birmingham he obtained an interview with Wm. Boulton, who gave him no encouragement, telling him they had no vacancy, as trade was slack. As Boulton was bidding the shabbily dressed and foot sore millwright good speed to some other shop he was struck with the peculiar appearance of the hat Murdock wore, and suddenly called him back and asked what it was made of.

"Timmer, sir," said Murdock modestly.

"Do you mean to say it is made of wood?"

"Deed it is, sir."

"How was it made?"

"I just turned it in the lathie."

"But it is oval, man, and the lathe turns things round."

"Aweel! I just gar'd the lathie anither gait to please me, and made me one."

This was sufficient proof that Murdock was a mechanic of no mean skill. He was put upon a trial job in the Soho works, and quickly displayed his capabilities as a workman, which led to his engagement for two years at the rate of 15 shillings a week. He commenced as an ordinary workman, but his diligence, sobriety and skill soon led to his promotion, and it was not long before he became Boulton & Watt's most trusted co-worker and adviser in all their important mechanical undertakings. When Murdock entered the Soho firm Watt was well nigh overwhelmed with the difficulties of getting his steam pumping engines into practical use; the worry and the vexations of the breakdowns in the machinery, Watt said, "would soon knock him up altogether." Murdock was appointed to superintend the erection and undertake the general charge of their engines in Cornwall, and he quickly overcame the difficulties that were more than Watt could manage.

Murdock traveled from mine to mine and often worked for long periods without rest and little food. His devotion to the work pleased Watt; his open countenance and friendly disposition, combined with his anxiety to please, soon made him very popular with the mine owners. Notwithstanding the long hours and incessant night work, occasioned by the superintendence of the engines under his charge, he found time to construct the beautifully simple model locomotive that we are so familiar with, which doubtless was the first successful road engine ever made in England. Watt had often talked of making a steam carriage, which would have been an abortion, with its condensing apparatus, wooden boiler and sun and planet motion. Murdock, with rare ability, discarded these cumbersome details and produced the high pressure engine. The first experiment was made in Murdock's house at Redruth in 1784, when the little model hauled a wagon around the room, the single wheel, placed in front of the engine, fixed in such a position as to enable it to run in a circle. The model had been continually in the possession of the Murdock family when, in 1833, it was purchased by Messrs. Richard and George Tangye. It is now in the Birmingham Art Gallery, and is still in good working order, although over 100 years old, and when under steam is capable of attaining a speed of 6 to 8 miles an hour.* This little carriage was made with Murdock's own hands, which makes it exceedingly interesting to engineers.

In the year 1798 Murdock returned to take up his permanent residence at Soho. "His energies to further the interest and celebrity of this establishment were not used in vain, for they assisted, in no slight degree, in procuring for it a name celebrated throughout the civilized world. His time there was so completely occupied by his mechanical pursuits that he devoted no time to recreation. The rising sun often found him, after a night passed in incessant labor, still at the anvil or lathe, for with his own hands he would make those articles he could not trust to unskilled ones." Among his inventions we may enumerate the following: 1, An apparatus for boring cylinders; 2, a new method of forming steam jacketed cylinders; 3, the sun and planet motion used on Watt's engines for procuring a continued rotative motion from a reciprocating engine, without the intervention of a crank; 4, the double D slide valve and other valves used on Watt's engines; 5, a rotary engine, one of which continued in use for 30 years and worked well; 6, the locomotive engine already referred to; 7, a patented method of boring stone pipes for water; 8, a lift worked by compressed air; 9, the cast iron cement so extensively used in the old days; 10, the oscillating engine.

Murdock is still better known to the public, and most deservedly so, by his invention of applying the light of gas from coal to economic uses. For the first experiment Murdock procured a kettle, which he placed on a fire in his workshop, after filling it with small coal. The spout of the kettle had a perforated thimble on the end, through which the gas issued, giving a good flame when lighted. Many experiments on a larger scale were carried out, and eventually Murdock's house and offices, at Redruth, were lighted with coal gas, made in an iron retort and conveyed in pipes to the different rooms of his house, where it was burned at proper apertures or burners. This appears to have been the first application of gas for useful purposes, although the gas had been discovered and obtained both naturally and artificially more than half a century before. "Murdock had a gas lantern in regular use for the purpose of lighting himself home at night across the moors from the mining engines that he was erecting to his house at Redruth. The lantern was formed by filling a bladder with gas, and fixing a jet to the mouthpiece of the bladder, which was attached to the bottom of a glass lantern, with the bladder hanging underneath. After various experiments, by which he proved the economy and convenience of the light so obtained compared with that from oils, resinous or animal substances, he perfected his apparatus and made a public exhibition of it by lighting up the front of Boulton & Watt's works, at Soho, on the occasion of the general illumination for the peace of Amiens in 1802." This brilliant illumination was received with immense enthusiasm. Watt would have nothing to do with any patents relating to gas, hence Murdock derived no advantage from the extended use of the new system of lighting beyond the honor of having invented it. Two large cotton mills in Manchester were fitted up with gas in 1805, and another mill in Leeds soon afterward. It became necessary to enlarge the Soho works to make room for the manufacture of the gas making apparatus. Murdock published a paper describing the advantages of the new light in 1808, for which the Royal Society presented him with their large Rumford gold medal. The retort first employed by Murdock was made of cast iron of a cylindrical form, placed vertically in a common portable furnace. The inconvenience of removing the coke from the vertical retort led to the adoption of a horizontal cylinder. These retorts were also made of cast iron, from 12 to 20 inches diameter, and from 3 to 7 feet in length. The form of retorts used at the cotton mills of Phillip & Lees was similar to that first mentioned, but larger in size, and a cage was adopted to facilitate the discharge of the coke; this cage was let down into the retort previously to charging it with coal, and was afterward lifted out by means of a small crane, when the process of distillation was completed, bringing out with it the whole of the coke. Murdock tried a retort having an opening at each end, but this was found to cost more, and he adhered ultimately to the simple horizontal retort, which came into general use, and continued so, with little alteration in principle, up to recent times.

As soon as it was proposed to light the streets with the new method, the idea was ridiculed by Sir Humphry Davy, who asked if the dome of St. Paul's would be used as a gasometer! Sir Walter Scott made clever jokes about those who proposed "to send light through the streets in pipes" and to light London "by smoke," though he was glad enough, not long afterward, to make his house at Abbotsford light and cheerful on wintry nights by the use of that very "smoke." Wollaston, a well known man of science, declared "that they might as well attempt to light London with a slice from the moon." *

When the House of Commons was first lighted by gas the architect imagined that the gas ran on fire through the pipes, and therefore insisted on the pipes being placed several inches from the wall, for fear of the building taking fire; we are also told that "the members might be observed touching the pipes with their gloved hands, and wondering why they did not feel warm." In 1814 Westminster Bridge was first lighted with gas; Glasgow was lighted in 1817, Liverpool and Dublin in 1818, and Birmingham not until 1826. "So completely was Murdock absorbed at all times with the subject in hand, that he was regardless of everything else. When in London explaining the nature of his substitute for isinglass, he occupied very handsome apartments; he, however, little respected the splendor of

* "One and All," by Richard Tangye.

* "Invention and Industry," Dr. Smiles.

his drawing room, and proceeded with his experiments quite unconscious of the mischief he was doing. One morning his landlady, calling to receive his orders, was horrified to see her magnificent paper hangings covered with wet fish skins hung up to dry, and he was caught in the act of pinning up a cod's skin to undergo the same process. He and his fish skins were at once thrown out of the house into the street."* During the erection of an apparatus for heating the water for the baths at Leamington Murdock met with a severe accident; a heavy cast iron plate fell upon his leg and crushed it; he never completely recovered from the effects of the accident, but as soon as able he was at work at the Soho factory again.

Although Watt ignored the use of steam as applied to navigation, Murdock and the younger members of the firm took up the question, and devoted themselves to the manufacture of engines for steamboats with success. Dr. Smiles says: "In the midst of these repeated inventions and experiments Murdock was becoming an old man; yet he never ceased to take an interest in the works at Soho. At length his faculties experienced a gradual decay, and he died peacefully at his house at Sycamore Hill, on November 13, 1839, in his eighty-fifth year. He was buried near the remains of Boulton and Watt, and a bust by Chantrey served to perpetuate the remembrance of his manly and intelligent countenance."

Water Test for Plumbing.

From P., *New York.*—Of all the methods which have been devised for testing plumbing work, that which calls for filling the pipes with water from the lowest point to the roof, is probably the most satisfactory for new work. If what is known as "extra heavy pipes" are used there is no difficulty in making tests under a head of from 60 to 70 feet. This method is easy, both for the plumber and for the inspector. It is straightforward, calls for no special apparatus if properly conducted, and has the advantage of showing defects, not only at a glance, but also in a manner which is beyond controversy. If a small defect, like a sand hole, is discovered, a little salt in the water and a day or two of time will cause such leaks to close by rusting.

The disadvantages of a water test are that it cannot be applied in cold weather or when the pipes are chilled so as to cause the water to freeze when let into them. For men of small means the purchase of a sufficient number of plugs to stop all openings is a serious matter. This, however, in small buildings, and in towns where there is not sufficient demand to make the plugs a paying investment, can be readily overcome. In some parts of New York City it is the universal practice, after roughly testing the iron pipes and before sending for the inspector, to put in the lead work, and then, by soldering up the lead openings, to close the pipes entirely without the necessity for using the plugs. This method of testing has a very material advantage over the use of plugs. There is no danger of blowing out anywhere and deluging the house with water. There is an additional advantage, that a large portion of the lead work is tested, and the character of the ferrules and the ferrule joints is assured. At the present time ferrule joints and the ferrules themselves are the most imperfect parts of a plumbing system. The brass used in the ferrules is of the poorest character, and pin holes occur so frequently as to be a source of great anxiety.

* "Murdock's Inventions," Buckle.

The water test has practical advantages in showing cracks in the pipes and in the hubs. In almost any other test the detection of the cracked hub is extremely difficult. It is no small advantage, in making tests by means of water, that leaks show themselves to the eye in such a way that it is almost impossible to overlook them. Water runs down the pipe, leaving a dark stain, and, even where the pipe is hidden, the water follows down to the lowest points, and, by overflowing at joints or bends, always discloses any important defects. Along the seashore, in damp or rainy weather, the sweating of the pipes is, of course, a disadvantage, but rainy weather does not usually last long enough to make this a matter of great inconvenience.

TRAPS AND VENTS.

THE FOLLOWING PLUMBERS recently passed the examination before the City Board of Los Angeles, Cal., and were awarded certificates: George Meline, J. H. Varley, E. L. Baker, A. C. McDonald, William Martin, E. A. Campbell and J. H. Cummins.

C. A. AGGETT AND R. CHERRY, plumbers, of Montreal, Canada, have registered notice of the dissolution of their partnership.

THE CITY COUNCIL of Alexandria, Va., recently passed an act providing that plumbers, on opening streets, should deposit a fee of from $2 to $10 to insure the repairing of the streets, and any balance after the cost of repaving is deducted will be returned at the end of 90 days.

E. C. MERRILL, 168 Second avenue, Pittsburgh, Pa., issues a pamphlet illustrating and describing the thermostat of his manufacture. The pamphlet gives facts and figures on the combustion of natural gas in coal burning furnaces, and also shows cuts of various gas burners. Among other goods noted are a bath water heater and a porcelain lined water heater. The several articles are illustrated and briefly described.

IT IS CLAIMED that all the plumbers of St. Joseph, Mo., have at last been taken into the association.

WE ARE IN RECEIPT of the illustrated catalogue and price-list of the Iona Mfg. Company, 336 Congress street, Boston, Mass. The goods shown include lamp sockets, switches of various kinds, cut outs, insulating joints, the Iona gas lighting burner, gongs, watchmen's time registers, &c. All the articles are neatly illustrated and described and accompanied by price-lists.

THOMAS HYDE of Albany, a practical plumber and inventor of a number of plumbing specialties, recently spent a few days in New York visiting the trade.

HARRY L. MCKOWN, recently of the firm of Adams & McKown, has opened up a plumbing establishment for himself at the corner of South and Market streets, Wheeling, W. Va.

LAST SATURDAY AFTERNOON three tin roofers employed by John Regan of 152 Franklin street, and some steam fitters and plumbers employed by Blake & Williams, 188 Wooster street, New York, embarked in a boat 20 feet long for New York from Hoffman Island, where they were engaged in doing some work on a Government contract. Ordinarily the boat carried eight passengers, but on this afternoon 22 men anxious to get home crowded into it. As a result the boat was upset and ten men were drowned.

RANDOLPH & CLOWES of Waterbury, Conn., are making considerable improvements in their plant in many directions. They have recently established a department for the manufacture of plumbers' materials and supplies. They are using for this purpose a portion of the buildings which have remained unused heretofore since the time of Brown & Bros. This department has only been started this year. They have facilities for the turning out of new patterns and designs for such things as lavatory legs and brackets. Their operations in this direction are facilitated by their having in their mill departments which furnish brazed tubing of the newest designs and moldings. They have recently taken out a patent in connection with this department for a plumbers' ferrule, of which, although on the market for a very short space of time, they are already making large sales.

IN DISCUSSING the condition of the times a New York street car conductor recently remarked that he never knew that there was so many plumbers till lack of work had forced them to drive cars.

THE REGULAR SEMI-MONTHLY MEETING of the New York Master Plumbers was not held last Tuesday night, owing to the election and the members being out doing their duty.

M. E. FREE has bought out the plumbing business of W. H. Spellman, at Omaha, Neb.

DR. RICHARDSON has bought the Masse Block, at Batavia, N. Y., and will put in a complete plumbing system.

WILLIAM O'DONNELL is erecting a building on Broadway, Ware, Mass., which he will use as a plumbing shop.

FRED ADEE, corner Beekman and Cliff streets, New York, displays the Duplex, his newest water closet, attractively in his show window.

FLASHINGS.

A. NORTHROP & Co., Pittsburgh, Pa., report that they have done considerable business this season in metal ceilings, especially some fine work for churches and business blocks. By attractive designs with contrasting borders and molding they not only furnish a handsome ceiling, but cover all joints. Among work recently finished in which their goods were used is the ceiling in the State Normal School at Geneseo, N. Y.; Presbyterian Church, at Tidioute; Methodist Church at Milford, Mass.; Catholic Church, Lenox, Mass., and Evangelical Church, Holton, Kan. They are sending out "A Dodger" with half-tone engravings of work for which they have furnished the material.

A FOREIGN EXCHANGE reports that at the Eskbank Iron & Steel Works, near Lithgow, New South Wales, Australia, plates and sheets ranging from ⅛ inch to 30 wire gauge in thickness up to 4½ feet in width and of any length, are now for the first time in the history of the country being produced. Corrugated sheets, tarred or galvanized, of a high quality, are also being largely produced at these works. This is a notable innovation, as Australia has been hitherto a large importer of sheet iron and steel for building and other purposes.

HENRY B. TODD has sold his manufacturing business at Meriden, Conn., to Proudman Bros. of that place, who will in the future supply the trade with the goods formerly made by him, including the Yankee Eave Trough Hangers, Giant Metal Cutter and Meriden Cutting Nippers.

WORLD'S FAIR NOTES.

The Columbian Museum.

The Columbian Museum, to which a slight allusion has been made above, is a contemplated outgrowth of the fair. Its projectors have secured a charter of incorporation and hope to retain the Fine Arts Building in Jackson Park as the home of the museum and a memorial of the great exposition. This building is strictly fire proof, being constructed of brick and steel, the only perishable feature being an outer coating of staff, which can be renewed from time to time as it needs repairs or else can be replaced by something more durable. Valuable collections of a greatly varied kind have already been secured for it. Many of the exhibits are of such a character that their owners would prefer to give them away, although costing large sums of money, if they knew that they would be cared for or would serve a useful purpose. For some time there was doubt about the project succeeding, as it was seen that it would be expensive, and the city authorities had no power to assume such a burden. But last week Marshall Field, the merchant prince, whose fame has grown with Chicago's growth, made a gift of $1,000,000, on condition that the incorporators raise $500,000 more in cash and secure the donation of $2,000,000 in exposition stock. This stock has a prospective value now of 15 to 20 cents on the $1, owing to the very favorable turn in the affairs of the Exposition within the last two months. So many holders of stock have already given it to the museum, and so many citizens of Chicago have subscribed cash in addition, that Mr Field's contribution is almost as good as clinched. Now that the museum project is in such excellent working order, the work of soliciting gifts for collections of various kinds by technical schools and other institutions have been in great measure abandoned, on the ground that it is better for the general good to have one great collection in such a museum than a number of fragmentary ones.

A Woman's Memorial Building.

So much was accomplished by women in showing the special aptitude of the sex in connection with World's Fair matters that efforts are being made to continue the work thus begun. Potter Palmer of Chicago, whose wife was the brilliant president of the Board of Lady Managers, has donated $200,000 toward the erection of a building in some suitable location in that city. This is another of the many permanent influences growing out of the great forces exerted in the building up of the fair, and is made possible through the munificent endowment of one of Chicago's public spirited citizens.

The Passing of the Fair.

Those who counted on being able to supplement in November the partial sight-seeing previously done have been grievously disappointed. Exhibitors are too eager to get away, and, of course, exposition officials are anxious to accommodate them. Tracks now disfigure the grounds, while the interior of the buildings has been a scene of confusion since November 1, which has only been intensified every succeeding day. Some buildings are already half deserted, the work of removal being more quickly accomplished than had been deemed possible. Very shortly the deserted buildings will be all that is left of the glories of the fair and then the work of destruction will begin on them.

Summing Up the Attendance.

The World's Fair period extended over 183 days, of which 179 were open days, the exceptions being the four Sundays, May 7, 14, 21 and July 23, when the gates were closed to the public and open only to those whose passes denoted they had business in the grounds. Of the 183 days 27 fell on Monday, for Monday opened and closed the fair, while each of the other days showed up 26 times on the World's Fair calendar. Thursday was the popular day, although Monday and Saturday pressed it hard. But Monday's popularity, as shown by the attendance, was not fairly won, for Chicago day, with its 716,881 paid admissions, came on Monday, and it brought Monday's average up.

The daily attendance reports show that 3,621,358 people paid to get into the fair on 27 Mondays, or an average of 134,124; the 26 Tuesdays were chosen by 3,395,308 people, or an average of 130,588; the 26 Wednesdays by 3,208,310, or an average of 123,396; the 26 Thursdays by 3,581,047, or an average of 137,732; the 26 Fridays by 2,875,379, or an average of 110,591; the 26 Saturdays by 3,576,975, or an average of 137,575, and the 22 open Sundays by 1,216 865, or an average of 55,312. The total Sunday attendance did not equal any of the last three weeks' attendance, and the average Sunday attendance was slightly more than one-half Friday's average, the poorest show day of the week. The smallest attendance came Friday, May 5, when 10,791 people paid to pass through the gates. The ten best days were as follows:

October 9—Chicago day	716,881
October 10—North Dakota day	309,294
October 11—Connecticut day	209,277
October 19—Ordinary day	305,961
October 21—Manhattan day	298,928
October 18—Ordinary day	292,458
July 4—Independence day	283,273
October 12—Italian day	275,217
October 17—Ordinary day	267,483
October 27—Coal, grain and lumber	254,763

There were 92 days when the attendance rose above 100,000; 53 days when it passed 150,000; 25 days when it went ahead of 200,000; 11 days when it passed 250,000; four days when it was over 300,000, and one day when it was above 700,000.

The attendance by months does not vary except by moving forward and upward in an accelerated degree. May's attendance was 1,050,037; June, 2,675,113; July, 2,760,263; August, 3,515,493; September, 4,659 871; October, 6 816 435. Total, 21,477,212, of whom 1,253,938 were children.

The total attendance, including passes, was 27,529,400. During the Fair 40,000 monthly and 39,840 full term photographic passes were issued. These, with the complimentary cards, workmen's tickets, trip passes and return checks, were used to the number of 6,052,188. Of this total 1,703 428 represents the return checks, giving a net total of passes of 4,348,760.

The Ferris Wheel.

The Ferris wheel paid $120,000 into the treasury of the exposition since September 9. The Ferris wheel is to the Columbian Exposition what the Eiffel tower was to the Paris exhibition. It typifies the ascendency of American genius on the Plaisance. From June 21 to October 26 the total number of passengers carried was 1,560,000. By a contract with the Exposition Company the Ferris wheel concessionnaires were not required to pay any percentage of their earnings to the exposition until they had taken in $300,000, if the wheel should cost that much, or whatever the actual cost was, if less. The wheel cost about $382,000. From June 21 to September 9 was required to reach the $300,000 mark, and since that date 50 per cent. of the gate receipts have gone into the coffers of the Exposition Company. The greatest number of passengers carried on any one day was 38,750, the number of tickets sold on October 10. Chicago Day is next in line with 35,000 passengers. The number of people who rode on the wheel July 4 was 14,000. The average daily number of tickets sold during July and August was about 9000. About the middle of September the number of passengers increased, and since then the daily average has been considerably over 20,000. No announcement has as yet been made by the management of the removal of the wheel. By the contract the removal of the wheel is not required before May 1, 1894.

Fresh Air and Heat.

One of the strongest recommendations for heating a building by an inflow of warmed air is that the air already in a building must get out to make room for it. Even if no special provision is made to get the air out, the fact that the building is warm shows conclusively that it has been disposed of or the warm air could not get in to raise the temperature to a comfortable point. Any plan that provides good ventilation economically is commendable, and the following is a step in the right direction :

A plan of heating mills has been introduced by which heated air is delivered from a large fan into flues in the walls, registers from each flue delivering the air into the different rooms, this air being heated by the waste gases from the boiler. The products of combustion pass from the boilers through economizers for heating the feed water, next through a regenerator for reheating the steam exhausted from the high pressure cylinder, and on its way to the low pressure cylinder, and then passes through air pipes, where it heats the cold air for heating the buildings, then passes to the chimney. If heated air is not wanted, but only cool air for ventilation, the gases from the boiler are turned by a damper into the chimney without entering the heater; and if the gases are not sufficient to heat the air as desired, additional heat is supplied by radiators of steam in this heater. The temperature of the air is raised about 50° by its contact with the hot gases.

A correspondent of the *Electrical Review* who has been reading about the proposed projection of signs for advertising purposes on the clouds over London, by means of the electric search light, suggests the vandalism of utilizing the Niagara Falls on a similar system. Why not, he says, place electric search lights on the Canadian side of Niagara Falls and project advertising announcements on the American Falls? The immense curtain of water would make a splendid background, and the rapidly falling water would produce novel effects on the signs. The trolley road now operating along the falls might utilize the scheme and give its patrons gigantic magic lantern shows on summer evenings.

Julien P. Cordier.

We present herewith an excellent portrait of the late Julien P. Cordier, manager of the Western branch of the Lalance & Grosjean Mfg. Company, 81 Michigan avenue, Chicago, who died somewhat suddenly at his residence, 5943 Wabash avenue, in that city, on the 2d inst. of hemorrhage of the lungs. Mr. Cordier was 51 years of age, and was born in the city of New York, of French parentage. He had been connected with the company since boyhood, having entered their employment at their organization, 35 years ago. The past 11 years of his service were spent in Chicago, where he was manager of that branch since its opening. He had previously traveled over every section of the United States and through the various South American countries in the interests of the concern. He was, perhaps, most intimately known, however, in the Southern States, where he spent much time and possessed a troop of friends. At the time of his death Mr. Cordier was a stockholder and one of the directors of the Lalance & Grosjean Company, of which his brother Augustus is the vice-president. Another brother, Joseph, is connected with the company's factory at Woodhaven, L. I., while a third brother, Charles, is connected with the Bridgeport Brass Company.

Julien Cordier was widely known and highly esteemed by the hardware trade of this country, and his acquaintance was also extensive in other parts of the American continent. He was a man of polished address and many accomplishments, and his genial nature and strict integrity gained for him a host of devoted friends, to whom the tidings of his too early death will bring a feeling of sorrow and loss. He leaves a widow and daughter. The funeral services were held in Chicago, and temporary interment was made there.

JULIEN P. CORDIER.

SCRAP.

Leon Langlors & Co., the owners of large steel works at Basse Indre, near Nantes, in France, have recently opened new tin plate works, constructed on the most approved principles. The works are under the management of Thomas Day, lately manager of the Waterloo Tin Plate Works, Machen, Monmouthshire, England, who has obtained the assistance of a number of Welsh workmen. The firm are now in a position to manufacture tin plates from beginning to end, instead of being under the necessity of importing the black plates required, as they did formerly.

McClure & Co., 62 Second avenue, Pittsburgh, Pa., are offering to the trade McClure's Redipped, McClure's Hand Coated and O. B. T. brands. The above firm have met with gratifying success since establishing in Pittsburgh and attribute it solely to the fact that their different brands of tin and terne plate have given entire satisfaction to their customers. Both members of the firm have had years of experience in the tin plate business, J. J. O'Connor having been connected with N. & G. Taylor Company in Philadelphia for a long time and later represented the interests of that firm in Pittsburgh. T. G. McClure was connected with the house of John Dunlap & Co. of Pittsburgh for many years.

The first carload of material consisting of black sheets turned out at the new plant of the New Castle Steel & Tin Plate Company, at New Castle, Pa., was shipped to Chicago on Thursday, November 2, the statement that this product consisted of tinned plate being incorrect. As yet no product has been tinned by the above concern, but as soon as a sufficient supply of black sheets has been made the tinning departments will be put in operation. The firm expect to send out in a short time printed matter giving full information regarding the different brands of tin and terne plate which they propose to manufacture and other information of interest to the trade.

Shipments of tin plates from the United Kingdom to this country during the month of October were 13,000 tons, a falling off of 6000 tons from the figures of October, 1892. The total exports to all countries were 27 000 tons, or more than double the amount sent to the United States. As this country usually absorbs at least three-fourths of the British exports of tin plates, the falling off in the proportion shipped to this side is remarkable.

As illustrating the durability of terra cotta, it has been pointed out that the figure of Britannia on the top of the Liverpool Exchange, which is of that material, was made 100 years ago at the Doulton Pottery in Lambeth; and, though greatly exposed, is as perfect to-day as when erected.

British View of the Tin Plate Situation.

One of the great marvels of the people of the United States, and scarcely less so of the people of Germany and other countries, said a leading English trade journal recently, is the fact that South Wales should be able to retain such an almost entire monopoly of the tin plate trade as it has succeeded in holding up to the present time. So far as the export returns for the current year go they would appear to show that a larger quantity of tin plates was sent abroad in the current year than in the corresponding period of 1892. In spite of the considerable outcry about the probable effects of American protection on the tin plate trade, conflicting statements are published in American papers as to the prospects of the tin plate industry in that country. There seems to be no doubt that it is making progress, and it is likely to continue to do so to a larger extent than has yet been attained. This progress is likely to be facilitated by the fact that a considerable increase of demand has hitherto taken place in the United States from year to year, and there is every reason to believe that American markets will continue to become larger consumers. What is still required for the United States is a good home supply of tin, but up to the present time the expectations held out on this score have scarcely been realized, although recent advices from South America intimate that rich tin mines have been found and are being worked to some extent in that region. It is a curious fact that notwithstanding the serious depression of the iron and steel industries on both sides of the Atlantic, our exports of tin plates for the first eight months of the current year were more than 7000 tons in excess of the exports for the similar period of 1892. In Germany, on the other hand, the exports were about 41,000 tons of ship plates and tin plates together, as against 36,400 for the corresponding period of 1892.

Secretary Herbert has selected a special board to inquire into the best and most economical method of correcting the defects reported to be existing in some of the vessels of the new navy. The duty of the board will be to determine which should be adopted of the several plans submitted to the Navy Department for the redistribution or reduction of weights, &c., so as to correct the top heaviness discovered in the vessels. The ships included in the list to be investigated are the "Detroit," "Montgomery," "Machias," "Marblehead," "Castine," "Cincinnati," and "Raleigh," but it is possible that the work of the board may be extended so as to include all the vessels now under construction.

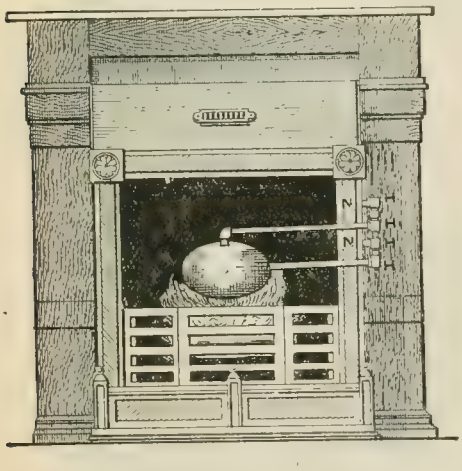
The Morfa Tin Plate Works, Llanelly, Wales, having secured a large order for plates, have resumed operations after a prolonged shut down.

STEAM AND HOT WATER.

Tainter's Latent Heat Retort.

We have received the following communication from E. C. Tainter, Madison, Wis., describing a device which he calls Tainter's latent heat retort, an illustration being presented in the accompanying cut:

The device consists of a steam tight metallic vessel with water attachments at top and bottom. The illustration shows it with hinged water pipes in order better to illustrate the movable advantages of it, especially when required for an open fire place or any kind of a grate fire. The retort, however, is not limited in its usefulness to fire place grates, stoves, nor any one class of domestic heaters. It is portable in a limited way, as shown by the illustration, the novel feature being the two hinged water pipes. The lower pipe is for cold water and the upper for steam or hot water. Both pipes are connected at some convenient point with other pipes used for a like purpose, or with a tank, so that the cold water will be fed by gravity and when warmed up will rise and thus give circulation. The grate shown in the illustration, known as Patton's hot water grate, has water spaces at the sides as well as at the back, and therefore gives an excellent opportunity for illustrating the practical utility of the retort for domestic purposes. The accompanying sketch,



Tainter's Latent Heat Retort.

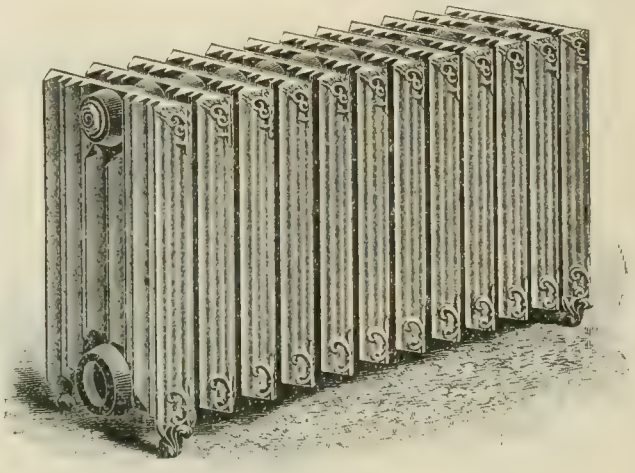
which was sent to *The Metal Worker*, was made by Master Charles Spooner of Madison, Wis.

Steam versus Hot Water Heating.

A somewhat extreme hot water enthusiast sends us the following: The late cool but not cold weather has compelled resumption of heating appliances and has been precisely of that sort which most strongly presents the principal advantage possessed by hot water as a heating medium—the regulation of heat to exact requirements; while, at the same time, it has rendered equally prominent the chief defect of steam as generally used for heating offices and dwellings—the impossibility of gauging the heat to a point not excessive for health and comfort. In the modern office building heated by steam and by direct radiation, most of the rooms are supplied with a single radiator of capacity sufficient to heat the apartment in coldest weather. The occupant, in such weather as has recently prevailed, has learned by experience the uselessness of attempts to moderate the heat by use of the radiator valves. He comes to his office in the morning, say at 9 o'clock, and finds his room a little chilly, as the janitor has had the steam turned on only a few minutes. He opens his mail, gets absorbed in his business, and in about an hour finds himself so uneasy that he pulls his mind out of the depths into which it has plunged, finds himself perspiring, and the thermometer marking 74° to 80° F. He says hard things about janitors, calling them all idiots, or worse, and in his haste to cool off, throws up the window. The autumn winds are out, and without invitation they come in, scattering papers into confusion; and the change of temperature being too marked, down goes the window again with a slam; more obloquy is heaped upon janitors, and the radiator valves are screwed down as hard as angry muscle can twist them. Now things again become placid, and the victim plunges once more into the intricacies of business. After a while he is recalled to a consideration of the condition of the atmosphere; but this time it is chill, not perspiration, that annoys. It being about lunch time now, he usually turns on steam again and goes out, only to repeat the experience of the morning when he gets back, fortunate if he has not contracted a cold to add to his other annoyances. It is probable that annoyances which business men have had with steam heat in office buildings have done more toward booming the business of hot water heating than almost anything else that could be named. It is time earnest attention was given to the perfection of a system of hot water heating for tall office buildings, which, as heated by steam, are, for the most part, very dens of discomfort when required to be heated in early autumn or late spring, and which, on the average, are overheated even in severe winter weather.

The Detroit Flue Radiator.

The American Radiator Company, 111 and 113 Lake street, Chicago, have added to their large assortment another new radiator, called the Detroit flue radiator, which is herewith illustrated. It is made 20, 18, 16, 14 and 13 inches in hight, and is intended for either steam or hot water. The sections are 12½ inches wide and 20 inches high, containing 6 feet of heating surface. It will be seen that this radiator is especially adapted to locations where a low construction is desired but without securing it at the sacrifice of radiating power. The loops are joined by screw and nipple with the same thoroughness and excellent workmanship characterizing all the other productions of this company.



The Detroit Flue Radiator.

HEATING NOTES.

The Avonmore Foundry Company are making arrangements for the establishment of a radiator plant at Avonmore, Pa. A building is being erected for the purpose, measuring 60 x 300 feet, and the plant is expected to be in operation early next summer.

C. S. Graves of the Model Heating Company of New York reports the following as some of the recently closed contracts for the Novelty hot water circulator: The Fire Department Headquarters at Plainfield, N. J. George Hardifer of Paterson, N. J., has recently installed a circulator in the residence of J. Phillips. Harry Smillie & Co., Rhinebeck, N. Y., are installing a No. 24 in the residence of Mrs. Bishop. George Gates of Nyack is placing one in the residence of Mr. Blauvelt at Sparkill, N. Y. Thomas Cusick of Kingston, N. Y., will use one in the new pastoral residence of the Church of the Holy

Comforter. Receiver of Taxes J. H. Rogers of Flushing, L. I., will use a No. 1 for heating water in a 500-gallon tank. Adams & Spencer of Catskill, N. Y., are installing one in the residence of Mr. Spencer.

THE AMERICAN RADIATOR COMPANY, 111 and 113 Lake street, Chicago, are distributing a finely executed engraving of the new Municipal Building at Hamburg, Germany. It is a beautiful building, and the picture is worthily printed on a large card, so that it can be hung up. A peculiar feature of this building is that it is heated with American radiators. No less than four carloads of the company's radiators were required for this purpose. The contract for them was closed at the company's World's Fair exhibit with the official engineers of the city of Hamburg. It was the largest of the many foreign contracts secured by the company as the direct result of the World's Fair. They are excusably enthusiastic over the possibilities of establishing a large export business with the fine beginning thus made.

THE A. A. GRIFFING IRON COMPANY, Jersey City, N. J., issue a handsome new pamphlet catalogue of the Bundy radiators. The illustrations are process and line engravings, and the text is beautified with headlines printed in red. Extensive lines of Bundy radiators are shown, beginning with the Bundy Columbia, next the Elite, the Pyro, Princess, Renaissance and Dining Room. The Bundy Duplex base radiator is a construction that will interest the trade, being a base radiator furnished with two, three or four rows of loops, so constructed that only one or more rows may be used at a time, thus regulating the amount of heat in moderate weather. The various indirect radiators are likewise illustrated, and a page is given to the Bundy Crescent dampers or box base direct indirect radiators. At the close are miscellaneous supplies, and the Bundy floor and ceiling plates.

PRESIDENT JOSEPH E. BOND of the American Radiator Company is visiting the Eastern offices. He spent a few days in New York this week.

W. S. NAUGHRIGHT, the heating engineer for F. D. Stephens & Co., German Valley, N. J., reports that his firm have this year used five carloads of the goods of the American Boiler Company.

C. M. ROBINSON, an architect of Altoona, Pa., recently spent a few days in New York visiting the American Radiator Company and the American Boiler Company getting information on heating apparatus.

A 16 PAGE CATALOGUE, bound with a muslin lined brown cover, is received from the A. J. Bennet Patent Radiator Attachment Company of Woonsocket, R. I., with their name on the front cover in gilt letters and an illustration of a radiator with their Comfort foot rest in gilt on the back cover. The first pages are devoted to showing the Comfort foot rest attached to different kinds of radiators and in different positions. Then comes an illustration of it and an address to the trade, which is followed by illustrations of the different parts used in its construction.

W. M. MACKAY, 236 Water street, New York, recently received an order for 18 dozen valves from an English firm in the hot water and steam fitting business.

Water Hammer.

BY PERCIVAL H. SEWARD.

The knocking in steam pipes, or as it is technically called, "water hammer," is that most perplexing and annoying noise so often heard in connection with a steam heating apparatus. I know of nothing which is more liable to strike terror into the hearts of the timid than the continuous and awful pounding which it produces, seeming, as it does, as if there were a series of explosions taking place within the pipes themselves at frequent intervals, but with sometimes increasing force. The power of water hammering seems to be at times irresistible, as I have had cases brought to my notice in which it has burst and fractured heavy wrought iron pipes like so many pipe stems.

There are quite a number of ways by which water hammering is produced, but it seems to be always due to one cause, and that is a vacuum in the pipes. I do not say that a vacuum in the pipes will produce water pounding, but it is my opinion that a vacuum is always produced before water hammering commences. The most frequent source of this annoyance, and therefore the one which is taken up first, is the radiator. When a radiator has been shut off for some time, allowing it to get cold and then opened again when the system is under pressure, it generally follows that a water hammering is at once started which continues for some time. Its cause is not improper piping or lack of skill in planning the job, but seems to be one that is unavoidable even in the best constructed apparatus. When a radiator is closed off the steam which it contains condenses and falls to the base and with the water already left there when the valve was closed forms a considerable amount, which will be left stagnant in the radiator. When it has been left for some time and then steam turned on again it produces that gurgling sound which is soon followed by severe knocking or pounding. The way in which this effect is produced is, in my opinion, as follows:

The first turn of the steam valve has the immediate effect of producing a sharp sizzling, gurgling sound, caused by the steam entering with such pressure through the small opening that it forces itself through the water collected in the body of the valve, displacing it to a considerable extent, and therefore causing the main body of water to descend to fill its place and in turn be expelled by the entering steam.

This gurgling and cracking sound will be kept up until the radiator is filled with steam and the pressure in the radiator itself is equalized with that in the pipes. When this point has been reached the steam is, of course, not entering with such great velocity, and therefore gives the water a chance to gradually find its way out. The peculiar swishing sound, giving one the idea that the water in the radiator is being pumped back and forth by some seemingly unaccountable power, is another result of turning steam into a cold radiator. This is first caused by the water being driven by the entering steam up the tubes to fill a vacuum caused by the steam in top of the tube being rapidly condensed by contact with the cold surfaces of the radiator. When this vacuum is formed at the top of the loop, the water and steam rushes up both sides, and meeting together at the top produces a short, sharp crack, followed by the sound of the receding water, and directly afterward by the ascending water, and another short cracking sound, but less violent than the first. This is kept up for some time, the noises becoming less frequent and less violent, until they gradually die out. Of course, when I say die out, I mean in that one particular loop. The noise will be heard in the radiator until it is entirely heated. The cause of the second noise is the water receding from the first attack, as it were, allowing the steam to again rise, and, striking the surfaces, become condensed, creating another vacuum, thus causing the two descending bodies of water to be forced upward again and meet as before. This action is kept up until the loop has become sufficiently warmed to allow of steam being supplied faster than it is condensed, which, of course, equalizes the pressure at the top and bottom of the tubes and prevents the water rising and falling as before.

I have generally found that opening the valve one turn at first and then gradually afterward will be the most satisfactory course to adopt when letting steam into a very cold radiator. By opening the valve one turn at a time it will cause that aforementioned sizzling and gurgling sound, but it will generally prevent pounding in the pipes themselves, for the reason that what water does find its way into the pipes will not be of sufficient quantity to produce a vacuum, except in a very small pipe. The sizzling sound is not nearly so annoying as severe pounding, and if it is tolerated until the radiator is filled with steam, and therefore heated, the valve can then be gradually opened, allowing the partially heated water to descend, when in nine cases out of ten no further trouble will be experienced.

If, on the other hand, the valve is opened at once to its full extent the steam will enter with a tremendous rush and carry the water with it, thus causing the first sharp report and then the peculiar swishing sound of the water going back and forth in the loops, and as this is liable to take place in several loops at the same time, the noise, of course, will be intensified. The knocking will also be heard in the pipe itself, caused by a certain amount of the cold water having escaped and therefore condensing enough steam to cause a partial vacuum, which, when being filled, will be done with such force as to drive the water against the sides of the pipe itself, producing the true water hammering.

The first noise produced by opening the valve quickly has the tendency to make the operator as quickly close it again, when the pounding and knocking in the pipe itself is produced with such force as to make the entire radiator tremble. The water which has escaped into the pipe causes a vacuum as soon as the valve is closed, which is quickly filled again by the pressure of the steam below. The water will thus keep condensing what steam does reach the top of pipe, thus creating vacuums and being forced by the steam to fill them again, until the water is heated and little by little finds its way down the pipe. This noise sometimes lasts for a considerable time, and, therefore, even when the valve is opened to its full extent it is better to leave it so than attempt to close it again.

I once heard of a case of this kind in which the side of the valve was blown out. The conditions were somewhat different, but the principle was the same. A battery of boilers were connected with a main steam drum by separate 6 inch pipes, valves being

placed at their angles. One of the boilers had been out of use for some time, but was to be started up again. The fireman went to open the angle valve on the pipe leading from boiler to drum, but on the first turn or so of the steam a pounding was produced which caused the fireman to quickly close the valve again, when, of course, the pounding continued with increased force and with the result above mentioned. The pipe connecting to the boiler was taken from the bottom of drum and therefore full of water. If the valve had been opened and left that way no harm would have been done, as the steam in the drum would have simply blown the water into the boiler and then followed itself; but when the valve was closed the steam that was in the pipe was quickly condensed, thus forming a vacuum, and the filling of same, backed by the high pressure in the drum, was of sufficient force to break the valve, it being the weakest part in this case.

When steam commences to enter a cold radiator during the first starting up in the morning, knocking and hammering will sometimes be caused by air valves being too wide open, allowing the steam to enter too rapidly, forming vacuums and producing the same results as when a radiator is shut off and then opened again after being cooled. After an apparatus has cooled down for the night, or at any other time, a perfect vacuum will be formed in the entire system, providing the air valves do not leak. This is considered an objection by some parties, and therefore they recommend raising the safety valve or else putting on a vacuum valve so that air can be admitted.

As far as my experience goes I have never been able to see the force of this argument. The only advantage secured by it is that if a rapid fire is started in the boiler it will not produce hammering, for the reason that steam cannot ascend to the radiators until the air has a chance to escape, whereas with the system a vacuum the steam would at once rush up and produce the same result as turning steam into a cold radiator. I do not believe in any device or arrangement made to allow of carelessness being practiced, except when it would be a source of very great danger. An intelligent man can be relied upon better than any invention, and therefore ought to be educated up to a point where he will not be liable to kindle a fierce fire in a steam heating apparatus.

If a slow fire is started the entire system will get hot when acting on a vacuum quicker than by heavy firing and a system filled with air.

Water as soon as it receives heat gives off a vapor, which is in reality steam, but is not called so until by confinement it reaches a pressure equal to that of the atmosphere. We have all noticed an open kettle containing heated water will give off this vapor, and if the hand be held over it a slight heat will be felt, increasing as the water gets nearer the boiling point. This is exactly what takes place in our steam boiler, but if the system is a vacuum the vapor having no resistance will ascend as rapidly as it is formed, and thus get all the radiators hot before steam is registered on the gauge. If, on the other hand, the system was filled with air, the steam would have to reach atmospheric pressure before it could expel the air. By leaving the system a vacuum we obtain a quick and effective result, as in a system in which the air is drawn from the radiator by an exhauster or other method, known as the "vacuum system of heating."

When a radiator is cold and filled with air, as is generally the case, pounding and other noises will be prevented by allowing the air to escape very slowly, as steam can only enter as fast as air is expelled. This applies more particularly to radiators which contain no collection of cold water, but can be followed in all cases with marked results. Turning steam into any cold pipe is almost sure to produce water hammering, as, on account of steam being condensed by contact with the cold surfaces of the pipes, a body of water is formed which is forced along with the steam, but with less velocity. The steam traveling ahead of the first body of water will form another separate body, the steam in between, which is rapidly condensed, forming a partial vacuum, and as the two bodies of water each rush to fill the vacuum a sharp pounding or hammering is produced when the two bodies meet or when either one strikes a bend or turn in the pipe. The effect of this hammering, when it occurs with much intensity, is more disastrous to cast iron than wrought iron pipes, as the tenacity of cast iron is much less than wrought iron, causing it to crack or burst more easily. A leak will generally be sprung at points where wrought iron pipe is connected with cast iron fittings before the pipe itself will be fractured.

What I have been dealing with principally up to this point is "water hammer" produced from causes which are no fault of the steam fitter or engineer. I will now take up a few cases in which errors in piping, planning, &c., will produce equally as bad and often worse results.

The most frequent cause for noises in steam piping is the trapping of those pipes used for returning the water of condensation to the tank or boiler. If a pipe should be crowned up at any part of its length steam will collect, and becoming condensed create a vacuum, when the water will rush up and expend its force against the top of the crown or at the end of the pipe if it is closed. This effect may be produced in equally as severe a manner if the end of the pipe is open, as the two bodies of water, being forced to fill the vacuum, one by atmospheric pressure and the other by steam, will meet and so expend their force upon the sides of the pipe. This trouble will never be encountered if the pipes are of sufficient area to do the work required of them and have a gradual fall away from the entering steam.

Single pipes, in which the steam is flowing one way and the water another, are also a frequent cause of water hammering. This is caused in a case of this kind by a larger body of water than usual descending the pipe, closing up the opening for steam and imprisoning that which is already behind. The imprisoned steam condensing forms a partial vacuum, which is rapidly filled by the water driven back by force of the entering steam. This gives more water still, which has to find its way out, and often the hammering will be continued so long as to become not only a nuisance to most people in the building, but a perplexing problem. The best remedy in this case is to enlarge the size of the pipe. I always recommend that the horizontal pipes in regular steam connections be made one size larger than the corresponding vertical pipe, which will be found to reduce the danger from this source to a minimum and prevent it in most cases. Making the return pipes too small will also cause much trouble—that is, what are called dry returns, those which are below the water line in boiler. The cause of the noise in this case is almost identical with that just described, but with the difference that the descending water when filling the pipe imprisons the steam ahead of it. A "dry" return pipe never ought to be more than two-thirds filled with water. Their sizes are determined by the amount of radiation, as its condensation can be easily figured, also the velocity of the flow of water. It is safe to say that if a steam apparatus is carefully figured out, allowing a sufficient area for all pipes, so that they can do what is required of them, with a margin of 25 per cent. for emergencies, and then properly erected, always giving the mains a fall of 1 inch in 20 feet away from the entering steam, no water hammering will be heard.

Connecting a supply and return pipe to each radiator, or, as it is called, the "two pipe system," will not prevent the trouble at the radiators, even when operated in an intelligent manner, while, on the other hand, it will be the cause of continual annoyance, caused by leaving some valves open and the others closed, thus making an unequal pressure in different pipes, which will in itself produce the very trouble against which we try to contend. No pipe running to a radiator connected on the "single pipe" system ought to be over 10 feet in length, and, if this rule is followed, and all these single horizontal pipes are made one size larger (which practically means double the area of the corresponding vertical pipe), no trouble will be experienced if it receives ordinary attention.

If a valve is placed on any steam pipe, a valve ought to be placed on the corresponding return pipe (if there is one), and they must be both either opened or closed, practically at the same time. If we close one valve on main steam pipe leading from boiler and do not close the corresponding return the rapidly increasing pressure in the boiler will drive all the water into the returns and then we will hear water hammering of a kind to be remembered. It is for this reason that check valves are sometimes placed in the return pipe leading directly from boiler, but, as they are liable to get corroded and stuck, I cannot say that I recommend them for this purpose. It is much better for the attendant or fireman to understand the system, and so get into the habit of depending to a great extent upon himself for its successful operation.

Sylvester P. Pierce, president of the Pierce, Butler & Pierce Mfg. Company, died at his residence at Syracuse, November 5, at the advanced age of 79 years. In addition to this firm with which Mr. Pierce's name is associated, he was also connected with S. P. Pierce & Son of Syracuse, who are the proprietors of one of the largest crockerystores in central New York. The two large enterprises with which Mr. Pierce was connected, and which owed their prosperity largely to his work and direction, are left in a flourishing condition.

Lavaoid is a cement for iron and stone recently brought out in Austria and adopted by the Government. It consists of 50 per cent. of sulphur, mixed with iron, silicic acid and some alumina, and it is used in a molten condition, cooling quickly.

THE RETAIL STORE.

Climax Coal Screens.

The Gilbert & Bennett Mfg. Company, 148 Lake street, Chicago, and 44 Cliff street, New York, have just brought out a coal screen adapted for use either on the side of a car or in a yard. Two illustrations are herewith given, one showing how the Climax screen is secured to a car for screening into a wagon and the other showing how the same screen is adapted for yard use by the addition of a head board and a foot rest. In using it on a car the clamps are secured to the side board and the iron leg adjusts it to the required incline, holding the screen firm and independent of the wagon. If it is wanted to screen from a box car it can be secured to the grain door, or one or two or more planks can be fastened together for the right hight long enough to rest against the inside of the door frame. This will also serve to keep the coal from rolling out on the ground. For yard use the clamps are secured to the foot board, and the head board is fastened in position. The screen can be placed at any required incline and the clamps secured so the foot board is always vertical, rendering the screen firm to shovel against. The screen will also stand solid. The screens are constructed substantially and at the same time with a view to making them just as light as possible. Double crimped steel cloth is used. The frames are hardwood and covered with heavy sheet iron where the coal rolls down. The sides are strengthened by strong iron braces. The legs and clamps are strong and capable of quick adjustment. There are as few parts as possible to render the screen complete. All meshes are furnished from $\frac{3}{16}$ inch to 3 inches, but for general use the $\frac{3}{8}$ inch is recommended.

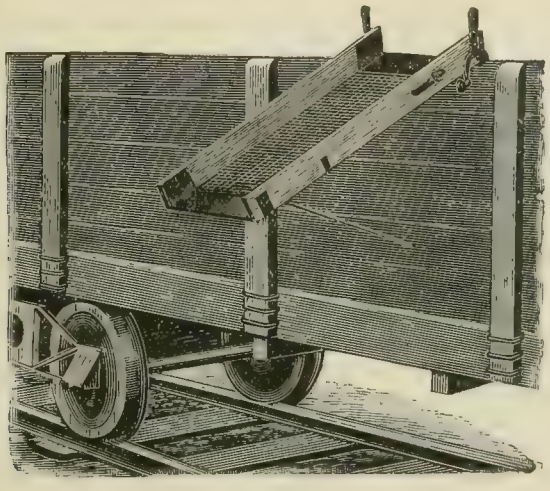


Fig. 1.—Climax Screen on Car.

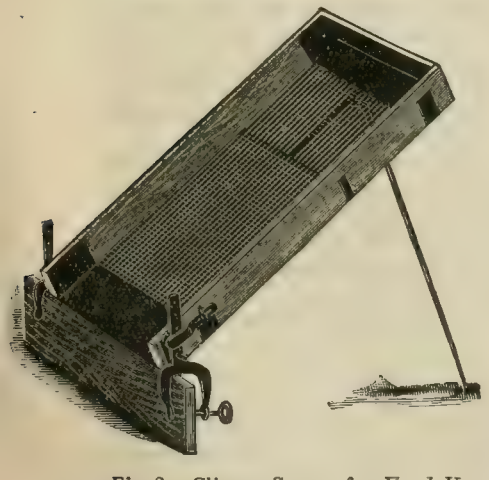


Fig. 2.—Climax Screen for Yard Use.

The Barler Ideal Oil Stove.

In the accompanying illustration is represented the brass oil tank and burner employed by the Huette-Barler Mfg. Company, 111-113 Lake street, Chicago, Ill., in Barler's Ideal oil heater. The outside shell and bottom are stamped from one piece, and the entire construction, together with the wick raising device, is referred to as an excellent piece of work. The manufacturers claim that special attention has been given to perfecting the working parts of the stove, and that it will not get out of order, as is often the case with the ordinary construction. The company's exhibit at the World's Fair received great attention on the part of visitors, and was awarded a premium and medal. In connection with the World's Fair the company disposed of a large number of their heaters in this country and shipped quantities of them to foreign parts.

The Barler Ideal Oil Stove.—General View of the Burner and Brass Oil Tank.

The Sensible Ice Tool.

N. R. Streeter & Co., Groton, N. Y., are offering an ice tool as herewith shown. It is made of cast iron, with sharpened steel points, and measures 9 inches over all. The article is referred to as a combination of an ice pick, chisel, pulverizer and hammer, and as being well adapted to use in any of these capacities. The tool is designed to retail for 15 cents.

The Sensible Ice Tool.

In a local paper of Fort Covington, N. Y., is an account of the tin shop and hardware store of G. A. and J. Farquhar of that place. It says that they have recently removed the partition from the front of their store, put in a new hardwood floor, and devote the entire space to store purposes. The workshop is now located in a large basement, which is provided with ample light for the workmen. In their store they make a fine display of stoves, ranges, hot air furnaces, household articles and farm implements, and a line of hardware and cutlery. Their present store is the outgrowth of a comparatively small beginning seven years ago and the result of untiring industry and perseverance.

The Royal Heater.

The Plume & Atwood Mfg. Company, 18 Murray street, New York, are offering the trade a heater to be used in connection with center draft lamps or

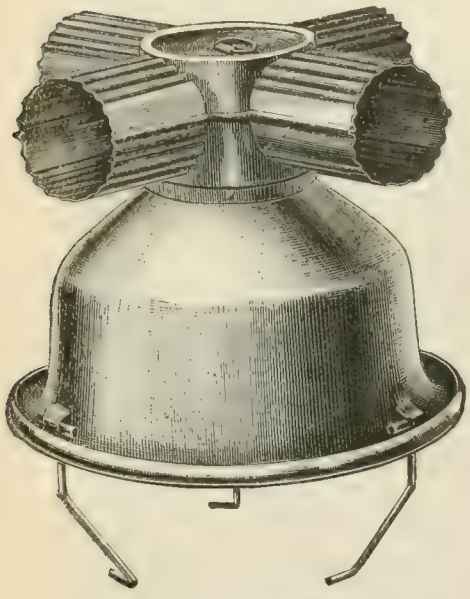


Fig. 1.—The Royal Heater.

argand gas burners, as shown in Fig. 1. The heater is made of full nickel plated metal and is easily attached to a lamp, as in Fig. 2, and as easily removed. The heater is so constructed on top that small vessels containing water for shaving or other purposes, or milk or food for infants or the sick, may be quickly heated. It is remarked that the heater is constructed on the prin-

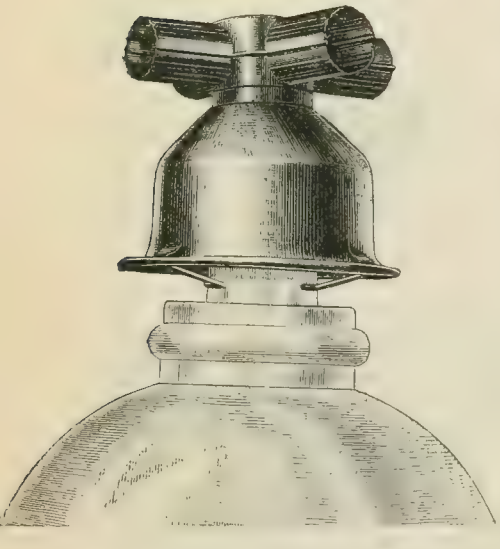


Fig. 2.—Position of Heater on Chimney

ciple that it creates an increased or forced draft, not only through the chimney, whereby the combustion is made more perfect but also under the shade, so that the cold air is constantly drawn under the shade, and being heated by the surface of the hot chimney, ascends to the heater, where it is still further heated by direct influence of the flame before it is discharged into the room. The manufacturers point out that this is a convenient, attractive, efficient and inexpensive mode of heating; that the device will heat small rooms, bedrooms and bathrooms without the use of other heat; that it is a valuable auxiliary in any size room in damp and extremely cold weather and that as a result of better combustion the heater saves 20 per cent. of the oil. The makers state that the best results are obtained by using the heater with their Royal and Banner lamps, though it is adapted to any center draft lamp or argand gas burner.

Retailers' Associations.

BY A. H. HOPE.

The retail hardware dealer is confronted with three influences that tend to reduce his profits and prove irritating in the conduct of his business:

1. The inexperienced competitor.
2. The untruthful customer who misquotes prices for his own benefit.
3. The competition of the jobber and manufacturer.

If he tries to fight them single-handed he makes but little headway.

THE DIFFICULTIES.

To attempt to interfere, advise, or guide his inexperienced competitor would be considered an impertinence. Yet the drawing of such a man into an organization is one way of getting him where he can be influenced to correct mistakes without appearing to single him out for a lesson.

The customer who quotes falsely for the purpose of forcing prices down has a wide field in which to work, so long as dealers hold each other at arms' length, and he is responsible for incalculable harm until he is discovered. When retailers meet in friendly intercourse this man's power of doing harm is curtailed and this evil disappears.

The tendency among large buyers is to get goods as near to headquarters as they can. Having secured quotations from the factory they often give the retailer the option of filling an order at these same prices, and if he does this he sees no profit in it.

How shall he protect himself against these three demoralizing tendencies?

Alone he can do nothing. He sees the evils but cannot conquer them. His profits are each year growing smaller, his work grows harder, and the future is less encouraging.

WHAT SHALL HE DO?

Common sense suggests that he and his competitors unite their forces and call upon their brothers throughout the country to unite with them.

They will discover at the outset that their competitors are pleasanter men than they had given them credit for being, are more kindly disposed and more amenable to argument.

Second, that the man who has been carrying stories from one to the other has been profiting by his falsehoods at their expense.

And, third, that their combined influence can be exerted both at home and abroad against the jobber or manufacturer who is selling their trade.

This latter evil is not one of sentiment, but is one of dollars. It is growing and will continue to grow while retailers do nothing but grumble. A union in one town even will do but little to eradicate it.

When a jobber is asked prices by a contractor in the town of A he refuses to quote him, because he has too good a trade with the retailer there to put it in jeopardy. But he has no trade to protect in B, so he quotes jobbing prices to the consumers there.

How can he be reached?

By the dealers in A and B uniting their forces so that an injury done one is an injury to all.

ORGANIZATION.

No section of the country is free from this trouble, though the more thickly settled the section the easier it is to reach the consumers' trade. The retailers of the whole country should be united to remedy this wrong, but union, like charity, should begin at home.

It would be easy to show how a union of retail Hardwaremen would be beneficial in numberless other minor ways, but the simpler the objects of an organization the better its chances for a long life. It ought not to be bound up in red tape or rituals, but be organized for profit.

In almost all things the individual can best work out his own success when free and untrammeled by organization or combination. But the evils complained of here have grown out of this very independence, and can only be remedied by union and by the massing of forces.

HOW SHALL THESE ORGANIZATIONS BE EFFECTED?

Not by articles in the press, nor after political methods. Some one man must take the initiative, visit his brethren, agree upon the abuses that ought to be considered, and when a number are ready to join with him in the call appoint a time for a meeting of all interested.

The organization must not attempt to limit the independence of any individual member. Whatever is to be accomplished must be through argument and intercourse, not through by-laws and blue laws.

Nothing must infringe the right of each man to manage his own business in his own way, even though that way is a ruinous one. A vast step forward is made when the dealers all agree to come together, and from such meetings helpful work will be evolved. The mere discussion of certain abuses will lead to their correction

Being organized, put yourself in communication through your trade paper with other unions, get into correspondence, work toward a State union, but continue your own local work whether you get up a State union or not. The time will soon come when you can say to the prowling jobber or manufacturer: "Hands off!" and your command will be heeded.

RETAIL HARDWAREMEN, LET US UNITE OUR FORCES; IN UNION IS STRENGTH.

STOVE TRADE NOTES.

Stoves in Belgium.

Consul Geo. W. Roosevelt of Brussels, Belgium, in a recent report to the State Department makes the following remarks in regard to the introduction of American heating stoves into that market: From time immemorial the method of heating houses in this country has until lately been wholly by open grate fires. Owing to the severe cold prevailing here during the long winter months, this primitive mode of heating has to a great extent been superseded during the past few years by the employment of a heating apparatus resembling in style and system the American stove commonly known as the base burner. These, as well as cooking stoves and ranges, are manufactured principally in Germany, and are in nearly every particular identical with the American product, which, I am informed, is rarely found on this market. There is a constantly increasing demand for the heating stove. It is not uncommon to see the base burner in the homes of the middle and lower classes, who have been attracted not only by its artistic construction, but also and mainly by its superior heating power and its great economy of fuel, an article which is scarce and dear here. It appears to me that this branch of trade ought to be entirely in the hands of American manufacturers. There is no reason why our stoves should not be placed upon this market at prices as reasonable as those coming from any other country.

Baldwin & Graham

of Pittsburgh and with a foundry at New Castle, Pa., have issued an attractive catalogue of something over 100 pages in which the Good Luck stoves and ranges are illustrated and described. The name Good Luck, which the manufacturers have adopted as a trade-mark, has been used by them and their predecessors for a number of years as a distinguishing name for some of their best soft coal ranges and cook stoves. A number of new modern and attractive patterns of stoves have been added to their already extensive assortment, and the dealer will be able to gather from an inspection of the catalogue a very good idea of the lines produced. The Margaret Good Luck, a six-hole range made with front or pouch feed, cut long centers, duplex grate, large ash pan, ventilated oven and adjustable oven rack, occupies the leading place. It is a new range of sheet flue construction, and is offered in four sizes and the usual modifications. The Florence Good Luck, another member of this class, is made for hard or soft coal or wood, and is offered either right or left hand, as may be desired. A very pretty soft coal range is the Model Good Luck, made extra large and heavy, and offered in four sizes. The Ella Good Luck is a four-hole range for soft coal or wood, although constructed more especially for using the former fuel. It is shown in several varieties in the catalogue, and is followed by the Good Luck four-hole cook stove, which embodies the latest features of construction and is ornamented in a tasteful manner. The Leader Good Luck, Welcome, Lincoln Good Luck, Rosalind Good Luck, Progress Good Luck, New Winsome Good Luck, the latter being intended for burning wood only, and the Macon City are some of the other goods to which attention is invited. The heaters are represented with the Good Luck square base burner in the place of honor. This is made in three sizes, and has round fire pot, vibrating anti clinker draw center grate and nickel trimmings. The Good Luck Oak, Sterling, the Times Cottage, the Frances Good Luck, the Good Luck Hustler, the Good Luck Franklin, the Gem Good Luck, Senator, Peerless and Alliance follow in the order named. Several pages are devoted to Good Luck gas stoves, portable ovens, hollow ware, stove trucks and a corrected list of stoves manufactured in Pittsburgh. The works of Baldwin & Graham were established by Thomas Mitchell in 1829, who was succeeded by Mitchell, Herron & Co., Mitchell, Stevenson & Co., Mitchell & Co. and Duncan & Baldwin. The works are complete in every particular and have a capacity of producing 30,000 stoves a year.

ODD PLATES.

JOHN D. OTTIWELL of Third avenue and Eighteenth street, New York, recently ordered among some repairs a grate and received a grate of the inverted basket pattern, which was represented as something entirely new. He found it to be exactly the same as the grate used in the Dr. Nott stove of 1836, recently illustrated in *The Metal Worker*, as he was familiar with that stove in the days of its popularity.

WE ARE INDEBTED to the Excelsior Mfg. Company, St. Louis, Mo., for a package of Charter Oak safety paper matches, upon the wrapper of which is the inscription, "No other stove or range is a match for the Charter Oak." We also have from the company a leaflet calling upon the recipient to prepare for the holidays by purchasing the Toy Charter Oak stove. This is said to be a lasting source of pleasure to the little ones, and is made in every detail just like the full size stove and with the same care.

THE WAIF-SAVING ASSOCIATION of America recently held an important meeting in the Hall of Washington at the Memorial Art Palace, Michigan avenue, Chicago, at which addresses were made and papers on the waif question presented. Among the latter was one by George H. Barbour of Detroit, discussing the subject of music as a factor in the training of boys. Mr. Barbour expressed great belief in the power of music not only for boys but for all humanity, and said that newsboys are more appreciative of music, when they are permitted to hear it, than the general public

A HANDSOMELY PRINTED FOLDER from De Haven & Co., Limited, Pittsburgh, Pa., illustrates and describes a new and richly treated open front Franklin stove which the makers are introducing to the trade. It is known as the Perfect Cinderella Franklin, and embodies a number of novel features, among which may be mentioned the arrangement of the blower. This works automatically in connection with the deflection or smoke plate, by which it can be raised or lowered, or placed at any point between, without effort on the part of the operator. The stove also has a draw center shaking basket grate, which is referred to as a novelty in stove construction and insuring a clean fire, as well as ease of cleaning the fire chamber. The patterns are ornamented according to the latest and most approved style, nickel and tile being judiciously combined to produce pleasing effects. The tile linings are made especially heavy to insure durability, and the makers state that the arrangement of the fire chamber is such as to give a maximum amount of heat from the fuel consumed. One style of stove is made with a heavy sheet iron back, fully protected by brick lining, making it, they state, fully as durable as an all cast iron stove, but which can be sold at a much lower price. Accompanying the folder is a tape measure 4 feet in length, carrying upon one side advertising matter concerning Cinderella stoves and ranges.

THE NORCROSS AUTOMATIC GOVERNOR for hot air furnaces is the subject of a circular which reaches us, bearing the names Norcross Regulator Company, C. C. Cobb, manager, 9 Murray street, New York. On one side of the circular is an illustration of a furnace provided with a Norcross automatic governor, while upon the other is a statement of some of the merits claimed for the device, together with the names and addresses of some of those who are using the governors mentioned.

L. E. AMBROSE has recently issued a notice to the effect that having perfected arrangements with the Twin Burner Stove Company of St. Louis, Mo., he will soon call upon the trade in their interests. He asks dealers to hold orders until he calls upon them with samples of the company's goods, special reference being made to the New Process hot generators and Juniors.

THE PENINSULAR STOVE COMPANY of Detroit, Mich., are sending postal cards to the trade bearing the inquiry, "Are you in a hurry?" The inference is that if dealers are in a hurry they should send in their orders at once, as the company declare they have everything necessary in the way of stock and can ship orders promptly on receipt.

THE GOODS of the Bennett & Peck Heating and Ventilating Company of Cincinnati, Ohio, are meeting with a gratifying reception in various sections of the country, and furnaces are being installed in numerous buildings, both public and private. As being of interest in this connection it may be stated that C. C. McGann, a citizen of Guthrie, has decided to put one of the company's furnaces in his new house, while B. T. Davis of Huntington, W. Va., has se-

cured several heaters of the company's make for his opera house building, which is said to be the finest of its kind in the State. The Building Committee for the new Odd Fellows' Temple in Ripley, Ohio, have been investigating heating systems, and finally selected that of Messrs. Bennett & Peck.

The Rock Island Stove Company of Rock Island, Ill., are sending out to the trade a little pamphlet printed in colors and bearing the title "A Novel Race." The left hand pages are devoted to a story told in rhyme, while the facing pages are given up to illustrations of stoves and heaters. The story has to do with a dream in which a number of stoves ran a race for the prize, "Superiority," the first of the illustrations showing the stoves in line with the starter holding the flag and ready to give the word. Another picture shows the Riverside range made by the Rock Island Stove Company gradually drawing ahead, while the third illustration shows it so far in the lead that the others can be seen but dimly in the distance. The fourth picture represents the winner of the race and the Riverside Oak surrounded by spectators, who are bestowing floral offerings upon the successful jockey.

S. S. Jewett & Co., Buffalo, N. Y., are sending to their friends in the trade a letter in which attention is called to the repeal of the purchasing clause of the Sherman act, through which an immediate revival of business is anticipated and that dealers will now have no cause for hesitation in placing their orders. The company have on hand a full line of stoves and ranges with which to fill orders promptly and are running their works full capacity so as to be prepared to ship promptly anything which customers may demand.

The Michigan Stove Company are furnishing their customers with a set of half a dozen "catchy" door signs. They consist of heavy manila paper, printed in imitation of writing with a marking brush, calling attention to the line of Garland stoves and ranges carried inside. They present the exact appearance of the home made signs hastily gotten up by enterprising store keepers whenever they receive a fresh shipment of goods to which they wish to call special attention.

The Copp Brothers Company, Limited, Hamilton, Canada, have issued for the press a neat catalogue of something over 80 pages, illustrated with broken and general views of the line of furnaces with which they are prepared to supply the trade. A few general remarks with regard to heating and ventilation are first given, after which are suggestions concerning the location of a furnace, followed by hints to furnace men and other points of interest in this connection. After illustrating and describing Boynton's new gas tight furnace, the Torrid steel dome and radiator furnace, the Challenge furnace, the Copp wood furnace and Copp's Warrior furnace, tables are given showing prices and dimensions of hot air registers and capacity of pipes and registers. Fully half of the volume is taken up with testimonial letters from some of those who have used the company's heaters. The catalogue is attractively bound in red paper covers, and will likely prove interesting to dealers.

The Columbian gas stove is the subject of an illustrated circular which reaches us from W. R. Calkins & Brother, 752 East Long street, Columbus, Ohio. This stove, we understand, is the outcome of numerous experiments in gas heating appliances, and with it, the manufacturers claim, it is not only possible to get perfect combustion of fuel and a maximum amount of heat at a minimum expense, but also to obtain satisfactory ventilation. "While this stove allows all noxious by products of combustion to pass up the chimney, it is so constructed that it gives off absolutely all the heat generated by the combustion." The front is composed of fire proof asbestos fiber and the heated air and products of combustion after passing over this enter a hood and pass down around the outside of the sheet iron back and then up a flue in the center to the pipe which leads to the chimney. The manufacturers claim that this passing and repassing of the air over the radiating surface of the iron back allows the heat to be given off freely before the air escapes to the chimney. The stove is made in two sizes and finished in such a manner as to prove ornamental. After a room has become sufficiently heated the gas can be turned down as low as will maintain an even temperature.

The Barler Ideal oil stove was the object of no little attention on the part of visitors to the World's Columbian Exposition, and the Huette-Barler Mfg. Company of Chicago, Ill., who make the heater, sold large numbers, many of them being shipped to England, Germany, Australia, South America, India, Japan and Mexico. With the advent of cold weather they disposed of a number at the World's Fair grounds, among the more prominent being six Ideal oil stoves for the officers' quarters of the United States model battleship "Illinois;" one for each of the 34 tents of the United States Marine Camp; six for the Spanish caravels; two for the United States Naval Observatory; three for the chocolate pavilion of Walter Baker & Co.; three for the Administration Building; three for the Texas Building; three for the Hindoo jugglers in the Midway Plaisance; 17 for the World's Fair Steamship Company; two for the Irish Village; three for the chocolate pavilion of Walter Lawney & Co., and one each for the Viking ship, United States steamship "Michigan," the Norway Pavilion, Royal Siamese Commission, Spanish Building at the north end of the grounds, the Spanish headquarters in the Manufactures Building, the office in the Childrens' Building, the Kindergarten in the same structure, the Commissioner General de Colombia and Hagenbeck's Arena.

The Art Stove Company of Detroit, Mich., have had an exceedingly gratifying sale of their oil heaters in connection with the World's Fair, the goods disposed of being intended for nearly every section of the country. Foreign commissioners and representatives manifested a desire to secure samples of these heaters, some of the more important countries purchasing being as follows: India, including six separate portions of the Empire, took 14; South America, 21; France, 12; Germany, 10; Great Britain and Ireland, 12; Mexico and China, 6 each; Hayti, 5; Turkey and Japan, 4 each; Sweden, 3, and Hungary, Denmark, New South Wales and Russia, 2 each. The domestic demand was also large and among the sales were 20 for Michigan, 14 for New York, 10 each for California and Indiana, 7 each for Missouri and Ohio, 6 each for Rhode Island, New Hampshire, Delaware, Minnesota, Massachusetts, Colorado and Pennsylvania, and 4 for Nebraska. The company report collections and business much better than they had anticipated, and expect that 1894 will bring increased activity in all departments of trade.

The Northwestern Stove Repair Company of 227-235 West Twelfth street, Chicago, Ill., announce, under date of October 3, that by a recent decision of the United States Circuit Court of Appeals, they have the right to manufacture and sell all repairs for Round Oak stoves made by the P. D. Beckwith Company, Dowagiac, Mich. They also state that they carry a large stock and are in a position to promptly fill all orders.

The Michigan Stove Company have had prepared for the use of their customers a very handsome silver and black enamel plate as a "close the door" sign. It bears the legend: "Please close the door and use Garland stoves and ranges." It is an acceptable device for the season and will doubtless be found on many store doors in every section of the country this winter.

A rumor has obtained circulation that the Detroit Stove Works contemplate the removal of their plant to some locality in the vicinity of Chicago. The report goes so far as to designate the point selected for the new works. The officers of the company, however, spoil the whole story by emphatically stating that there is not a word of truth in it. Probably the fact that the company are erecting a new warehouse in Chicago has been distorted by some one into the removal of the works. They will have a fine warehouse when it is finished, and its location will be such as to provide greatly improved facilities for serving the Western trade.

A more than usual demand for repairs this year makes things lively at the Stove Manufacturers' Repair Association, at 235 Water street, New York. The experience of Manager Betts enables him to solve all complicated problems satisfactorily.

The Boston Furnace Company of 71-81 Blackstone street, Boston, Mass., will remove on December 1 of the present year to large and commodious quarters at 175 Hanover street.

The friends in the trade of George W. Robertson of Southard, Robertson & Co., are congratulating him upon his success in the election of Tuesday last. Mr. Robertson received more than 2000 majority as a candidate for Senator to the New York State Legislature.

The Fuller & Warren Warming & Ventilating Company have been awarded a World's Fair medal and diploma for their warming and syphon ventilation. This is a system used exclusively in schools and public buildings. It is not a mechanical system requiring the use of a fan. Instead of this, the Fuller & Warren method of heating and ventilating provides a positive, constant and noiseless suction causing an outflow of 100,000 cubic feet per hour from schoolrooms accommodating 50 pupils. The warm air enters near the ceiling and is gently and imperceptibly diffused throughout the room, maintaining the temperature steadily at the proper degree. The exhibit of the company was made in the Anthropological Building. The stoves and furnaces of the Fuller-Warren Company, exhibited in the Manufactures and Liberal Arts Building, were not entered for competition.

Slandering the World's Fair.

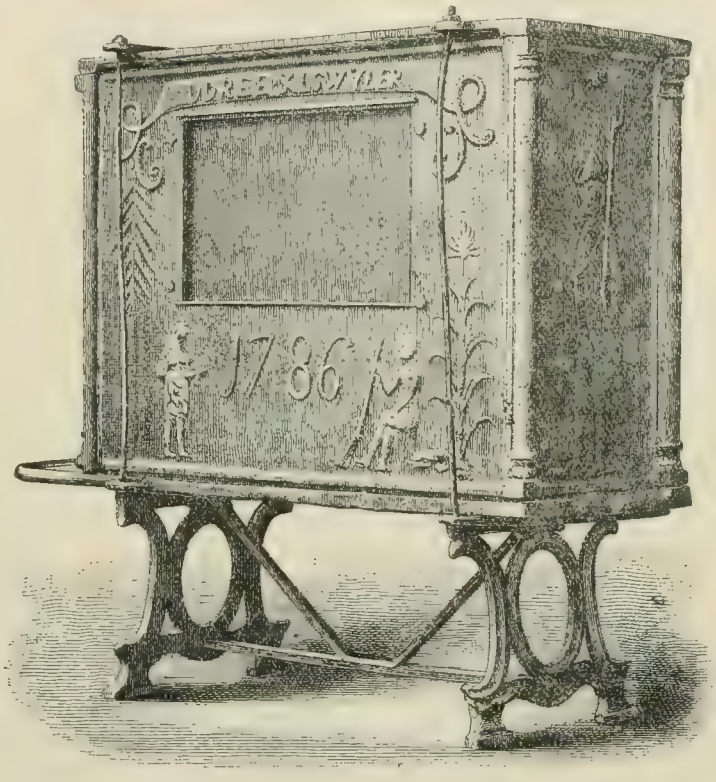
Ugly stories are in circulation regarding the management of the late World's Fair. It is asserted that exhibitors desiring liberal space were obliged to pay a good round price to somebody for the favor. The stories even go so far as to name the exhibitors and give the specific amounts which they were called on to pay. Further, it is alleged that the reason the stove manufacturers withdrew their exhibits from competition was that they realized among themselves that the awards would go to the highest bidder; in other words, that the man with the longest purse would get the most flattering diploma.

We have investigated these stories, so far as they relate to the stove trade, and are glad to say that we believe them to be utterly unfounded. So far as we have been able to learn, not a single penny has been paid by an American exhibitor for space of any size or kind. The space was allotted, as nearly as possible, according to the size and importance of the establishment proposing to exhibit. Those who exhibited say they were not asked to pay anything to anybody on this account. Some of them make the denial in very emphatic language, as an imputation on their fairness and business integrity as well as on the management of the exposition. Some of the foreign nations did charge for space. It was handed over to their commissioners for proper division, and a *pro rata* charge was imposed on those who exhibited for the purpose of defraying the expenses of the commission. In even such cases the exposition authorities received nothing, but the entire amount realized went to the foreign commission. It is possible that in some way this arrangement of the foreign exhibitors has been confused with the management of domestic exhibits. As rumors circulate it is astonishing how they assume definiteness and include names and amounts.

The charge that stove exhibitors withdrew their goods from competition because they knew or feared awards would go to the highest bidder is ridiculously absurd. In the first place, the withdrawal was made before the judges were appointed, and as they were the ones to make the awards, it is almost incredible that their probity should be attacked before knowing who they would be. We are assured that the possibility of venal judges had no bearing whatever on the case. The sole reason for the action taken was that several of the leading manufacturers thought that the premiums would not amount to anything except to stir up strife among their competitors, who should be their friends. A discussion of the matter with the other stove exhibitors developed a similar feeling among them, and the result was that a very large majority of them decided to withdraw their goods from competition. All the remaining exhibitors received prizes, but the distinction thus gained is deprived of its value by the very limited number of concerns left to compete. In no way, however, was there any reflection on the integrity of the exposition management or the judges.

A Curious Old Stove.

We have at different times in the past presented in these columns illustrations of old stoves as they have been brought to our notice, realizing that the members of the trade of the present day could not fail to be interested in constructions which were in vogue when stove making in this country, at least, was in its infancy. The illustration which is given in this connection is made from a photograph sent us by F. J. Allison of Statesville, N. C. He says that the stove was cast in 1786, and has been in possession or under the control of his family for over 75 years. It was hauled from Pennsylvania or Maryland soon after Mr. Allison's family settled in this country, and was first used in old Bethany Church, after which it was used in several school houses and later in the finishing shop at the tannery of Mr. Allison's father. It is still in active service in a finishing shop erected by Mr. Allison 12 or 15 years ago, and looks as if it were good for 100 years more. The stove shown in the engraving is 3 feet long, 2 feet high and about 18 inches wide. It weighs over 400 pounds and has in cast letters at the top of each side the manufacturer's name "Udree & Eswyler." At the left hand corner of each side is the raised figure standing under a hemlock tree of an Indian squaw with her pappoose, and extending her right hand toward a white man who, in the lower right hand corner, is seated on the stump of a tree. With one hand he holds the barrel of a musket, while the other rests upon his knee. Just behind him on the ground is his dog. Still further in the rear is a stalk of Indian corn. On the front end of the stove is an urn and on the rear end is the raised figure of a soldier in Continental uniform and carrying a musket. Mr. Allison is at a loss to know where the stove was cast, but is anxious to learn more particulars concerning its early history. If there are any of our readers who are in a position to furnish information concerning this particular stove we shall be very glad to have them write us in order that we may publish the matter not only for the interest it may have for the one who inquires, but also for the benefit of the trade at large.



A Curious Old Stove.

Boston Sheet Metal Workers' Strike.

A meeting of the furnace and stove dealers of Boston, whose tin and sheet iron workers have struck for a nine-hour work day, with a minimum rate of wages of $3 per day, was held Wednesday afternoon, when the situation was discussed at length. It was finally decided to offer the strikers the following proposition: That on and after the first Monday in January, 1894, nine hours shall constitute a day's work.

A crowded meeting of the strikers was held at 53 Hanover street Wednesday afternoon. The reports of the picket committees showed that the manufacturers had up to the present time been unable to fill the strikers' places. The strikers were unanimous in rejecting the proposition, and state that if the nine-hour day can be granted January 1 it could as easily have been granted November 1.

During the afternoon Business Agent J. T. Dolan had a long conference with one of the principal manufacturers, which resulted in the following proposition being made to his employees: "That 30 cents an hour be the minimum rate of wages, and that the employees be allowed to work either nine or ten hours, as they desire."

This proposition was not received with favor by the men. They claimed that if it was accepted it would be the cause of creating much dissatisfaction in the union.

TRADE REPORT.

The Iron Market.

The event of the week has been the confirmation through actual sales of reports current for some time past that a heavy cut in prices has been made in Steel Rails. The effect of the break in Rails is expected to be favorable to other branches. It is sure to lead to the placing of a far more liberal volume of orders for Rails, which will first clean up the accumulated supplies of Pig Iron at the Rail mills, and then will create a larger demand for Oreand Coke. It seems probable that the outcome will therefore be a strengthening of the markets of raw material as the first step toward a return to living rates for Iron and Steel.

The production of Pig Iron is on the increase again, the additions to the capacity at work in the Pittsburgh, Shenango, Wheeling and Mahoning districts being in response to a larger volume of business of the rolling mills and Steel works.

In the West, and to a limited extent in the East, the volume of orders is larger, but as yet the lowest prices reached are still the basis of business. Whether the Western mills will ease their pressure upon the Eastern markets soon remains to be seen. Until now they have not done so.

Pig Iron.—There has been no increase in the demand for Pig Iron in the New York and tributary markets. We quote: Northern brands $14 @ $15 for No. 1; $13 @ $14.25 for No. 2, at tidewater. Southern Iron, same delivery, $13 @ $14 for No. 1; $12 @ $13 for No. 2; $11.50 @ $12.25 for No. 3; $11.75 @ $12.25 for No. 2 Soft, and $12.25 @ $12.50 for No. 1 Soft.

In Philadelphia the demand is a trifle better for some grades of Pig Iron, and larger lots have been taken, but prices are as low as ever, and give no promise of early improvement. The demand does not probably exceed 35 % to 40 % of what is usually expected at this season. The advance in freights will, it is believed, probably affect prices at some points, and in fact may involve a readjustment all the way through; but at the moment there is plenty of Iron at the lowest of all the low prices heretofore quoted, which for Philadelphia and equivalent points are about as follows:

No. 1 Foundry	$13 75 @ $14.25
No. 2 Foundry	13.00 @ 13.25

At interior points, such as York, Harrisburg, &c., about 25¢ less is quoted on Virginia Irons.

Chicago advices report a perceptible improvement in the demand, which is especially noticeable in local Coke. Several contracts for round lots have been placed, indicating some revival in activity. The week has developed more inquiry, and business is particularly good in small orders for quick delivery, showing that consumers' stocks are light. It is believed that such stocks are smaller than ever before. The foundries that have been running for some time on their own Scrap or rejected Castings have about run out of that material, and are now obliged to come into the market for fresh supplies of Pig. A better movement is also observed in Lake Superior Charcoal Iron. The low sales made some time back are not being duplicated, but the furnace companies are getting better prices, and seem to have been able, at least, to get control of the value of their product. Sales of several round lots have been made at prices but a shade under $16. Quotations are now as follows for cash:

Lake Superior Charcoal	$16.00 @ $16.50
Local Coke Foundry, No. 1	13.50 @ 14.00
Local Coke Foundry, No. 2	12.75 @ 13.00
Local Coke Foundry, No. 3	12.25 @ 12.75
Local Scotch	14.00 @ 14.50
Ohio Strong Softeners No. 1	15.50 @ 16.00
Southern Silvery, No. 1	@ 14.50
Southern Silvery, No. 2	@ 14.00
Southern Coke, No. 2	12.10 @ 12.35
Southern Coke, No. 3	11.35 @ 11.60
Southern, No. 1, Soft	12.10 @ 12.35
Southern, No. 2, Soft	11.35 @ 11.60
Tennessee Charcoal, No. 1	16.00 @ 16.50
Alabama Car Wheel	18.50 @ 18.75
Jackson County Silvery	16.50 @ 17.00
Other Ohio Silvery	15 00 @ 15.50

Pig Iron.—The increased activity among mills that have been in operation right along, together with the demand for Iron that will come from those that have started up within the past week or ten days, has resulted in more inquiries for Iron, and more sales were closed during the past week than in any one week for some time past. The expected increase in demand has resulted in the starting up of a number of furnaces that have been closed for extended periods. While it is somewhat doubtful as to whether it is the best policy to increase production to such an extent just now, at the same time it shows that there is considerable confidence in the future. Quotations are given as $12.50 @ $13, cash, for No. 1 Foundry; and $11.50 @ $12 for No. 2 Foundry on the same basis.

Southern markets show little, if any, improvement in any feature of the Pig Iron trade during the week. There is, it is true, more confidence in the financial situation, but as yet this has not enlarged the demand for Iron to any great extent. The demand for Foundry Iron is very light, and for Car Wheel Iron there is no demand at all. All demands have so far been freely met at previous prices and there are offerings at the same rates to the end of this year, which is as far as the furnaces are disposed to name prices, but it is not improbable that they would accept orders running two months into next year for foundry grades. One hopeful feature in the trade is that shipments of Pig Iron have in many instances been resumed on old contracts. Quotations are as follows:

Southern Coke, No. 1	$12.75 @ $13.00
Southern Coke No. 2	10.75 @ 11.00
Southern Coke No. 3	10.25 @ 10.50
Ohio Soft Stone Coal, No. 1	15.50 @ 16.00
Ohio Soft Stone Coal, No. 2	14.50 @ 14.75
Lake Superior Coke No. 1	15.00 @ 15.25
Lake Superior Coke No. 2	14.00 @ 14.25
Hanging Rock Charcoal, No. 1	18.50 @ 19.00
Hanging Rock Charcoal, No. 2	17.50 @ 18.00
Tennessee Charcoal, No. 1	14.00 @ 14.25
Tennessee Charcoal, No. 2	13.00 @ 13.25
Standard Southern Car Wheel	17.75 @ 18.00
Lake Superior Car Wheel and Malleable	17.00 @ 17.25

Metal Market.

Pig Tin.—The market has recovered slightly from the depression more or less conspicuous last week. Prompt and current month deliveries now command 20.60¢ @ 20.65¢, with 20.70¢ for December, the offering being somewhat reserved. Comparatively few speculative transactions have been reported, and purchases by jobbers and consumers have been on decidedly conservative lines, hardly reaching the average of the season. Still the amount of stock in first hands continues to steadily diminish and the statistical position here is stronger to that extent. A partial offset exists in the fact that European stocks are being largely increased and that prices in the foreign markets are gradually receding to the parity of local market quotations. The visible supply in Europe and America is estimated at about 15,000 tons, or nearly the same as the quantity recorded for the corresponding period last year, including 3700 tons in America, exclusive of Pacific Coast, and 700 tons afloat. Prices for small lots are unchanged since last report.

Copper.—There have been additional purchases of fair sized lots of Lake Superior Ingot for prompt and near future delivery, chiefly by home consumers. At least 500,000 lb were involved. The prices ranged from 9¾¢ up to 10¢, according to delivery and other contract specifications. Meanwhile export movement on old contracts has continued liberal, while the output from the mines is still under more or less restraint, making in all a condition of affairs that serves to give the market greater tone of firmness for the time being at least. There is hardly any speculative inter-

est, and legitimate trade movement seems to be the foundation of the turn for the better that has taken place since the beginning of the month. Jobbers advise that inquiries have increased in number, with a fair proportion of ensuing sales, but usually for but moderate amounts. Stocks in consumers' and retailers' hands are thought to be very light, and the movement, consequently, represents little more than necessary purchases to fill immediate requirements. At the same time holders are not inclined to make contracts at current rates for deliveries more than a month ahead, as it is believed that prices have reached rock bottom, and that any movement will be an upward one. Quotations for small lots remain unchanged.

Sheet Copper. — The market for Sheet Copper has presented no striking features during the week, although the existence of a better feeling among consumers is deduced from the fairly large volume of inquires received from every section of the country. It is not, however, thought that these inquiries will materiailze into orders to any extent before the first of the year, after stocks have been taken and consumers and retailers have found out how they stand financially. Collections are reported to be more satisfactory. The price of small lots of Sheet Copper remains firm.

Pig Lead —Speculative interest in this metal has been on the wane, and consumers have purchased in a very indifferent manner. Sellers have offered in a manner indicative of some pressure to secure orders, and the supply on offer seems to be in excess of the outlet, prices being correspondingly easier. Some lines of common domestic were offered at 3 30¢ in round lots toward the close of the week, but buying interest was exceedingly languid. Jobbers report continued dullness in the consumptive demand, with small prospects of any material improvement in the immediate future. Prices for small lots of Pig remain nominally unchanged, but concessions on quoted rates are not hard to get when spot cash or other inducements are offered.

Lead Pipe and Sheet.—Dullness reigns in the Manufactured Lead trade. The suspension of building operations in the past season has largely contracted the demand for Plumbers' Materials, and it is not probable that any great revival of business can develop before next spring. No change has taken place in New York list prices.

Spelter.—Little if any change has taken place. The popular quotations are 3.60¢ @ 3.65¢ for ordinary Western brands, with an advance of about ¼¢ on small lots and the usual premium for special or fancy brands. Business has been slow here, individual transactions involving more than single carloads being the exception. The demand is exceedingly tame at this writing.

Tin Plates.—Fairly large orders have been placed for 100-lb Bessemer Steel Cokes, for March and April delivery, at about $4 90, landed here. This revived interest in futures is probably due in large measure to the fact that the recent run on these descriptions of Coke Plates has reduced the stocks of them in this country so largely as to threaten serious scarcity. Some interest has also been displayed in other varieties, and spot orders have been rather above the late average. The market is, however, uneven, and orders are mostly of a "peddling" character. There is, nevertheless, sufficient movement to keep prices quite steady for both prompt and future deliveries. Importations continue on a very conservative scale, and are fairly well absorbed; stocks throughout the country being extremely light. This is so much the case that, in the opinion of good judges, should an unexpected impetus be given to the demand for Tin Plates, dealers would be found to be in very poor shape for meeting it. Domestic Ternes, especially some favorite brands, meet with ready sale; and are in some cases hard to get promptly in response to orders.

Sheet Iron —The production of Galvanized Iron is creeping ahead of the demand, which has fallen off somewhat, though still fairly active. Jobbers report less difficulty in securing prompt filling of orders at the mills. The requirements of consumers of Black Iron appear to have been largely satisfied. The movement in this material is but moderate. Although prices are nominally firm, a shading of from 5¢ to 10¢ on quoted rates might be pretty essily obtained for spot cash and desirable orders as to size, time of delivery, &c.

THE COLUMBUS STOVE BOARD is the attractive novelty put out this year by John J. Sweeny & Co., 236 Water street, New York. The boards are furnished either wood or paper lined and crystallized or oxidized in finish, with a design printed in amber and black which includes a bust of Columbus, his flag ship, the American eagle and a circle of Cupids riding bicycles and flaunting the Star Spangled Banner. The design is calculated to warm a Yankee with enthusiasm when the fire in the stove has gone out.

THE COLUMBIA GRAY IRON COMPANY, Columbia, Pa., with New York office 35 Warren street, issue a catalogue and price-list of Hardware, Iron novelties, House Furnishing Specialties and Toys, in which they call attention to the increased line of goods the company are now making, also to the fact that in some instances the price-lists of their former line have been lessened. List prices and illustrations are given of Toy, Tack, Riveting and Upholstering Hammers, Toy Garden Tools, Banks, Hatchets, Hammers, Brackets, Can Openers, Clothes Line Hooks, Harness, Coat and Hat and Pivot Hooks, Drawer Pulls, Barrel Bolts, Latches, Match Safes, Flower Pot Brackets, Shutter Hinges, &c.

Chicago Report.

Scrap.—Trade in Old Material is steadily growing larger, but so much is offered that prices are weaker except for Old Rubber, which has again advanced. A good sale of Old Copper was made for export to Germany. Dealers furnish the following list of buying prices, Chicago delivery:

	Per net ton.	Per lb
No. 1 Wrought Scrap	$7.00	....
Machinery Cast	7.00	....
Malleable Cast	6.00	....
Stove Plate (free of burnt)	5.00	....
Burnt Iron and Grate Bars	3.50	....
Sheet Iron and Hoops	2.00	....
Plow Steel and Breaking Stock	5.50	....
No. 2, such as Shovels, Hoes, &c	4.00	....
Old Boilers—whole (Iron)	4.00	....
" (Iron)—cut in single Sheets and Rings	6.00	....
Old Gas-Pipe and Boiler Tubes	5 00	....
Cast Borings	3.25	....
Turnings	4 00	....
Horseshoes	8.00	....
Copper Bottoms	....	5 ¢
Copper Clips and Heavy	....	7 ¢
Heavy Brass	....	5⅛¢
Light Brass	....	3⅛¢
Pipe Lead	....	2½¢
Tea Lead	....	2 ¢
Zinc	....	2 ¢
Rubber	....	4 ¢

Anthracite.—The volume of business was not so large during the past week, but dealers look for another rush of orders after the next cold snap. Prices are very firm. Carload lots of 12 net tons or over are quoted as follows:

	Egg, Grate.	Sto. and Ch.
Chicago, Ill	$5.85	$6.10
Milwaukee, Wis	5.85	6.10
Kansas City, Mo	9.05	9.30
Council Bluffs, Iowa	9.05	9.30
Lincoln, Neb	9.20	9.45
Sioux City, Iowa	9.05	9.30
Aberdeen, S. Dak	9.10	9.35
Dubuque, Iowa	7.15	7.40
Madison, Wis	7.35	7.60
St. Paul, Minn	8.35	8.60
Burlington, Iowa	7.35	7.60
Des Moines, Iowa	8.80	9.05
Davenport, Iowa	7.15	7.40
St. Joseph, Mo	9.05	9.30
Leavenworth, Kan	9.05	9.30
Omaha, Neb	9.05	9.30

Colorado Anthracite.

COLORADO FUEL & IRON COMPANY.

Denver	$8.00
Pueblo	8.00
Colorado Springs	8.00
Leadville	8.00
Cheyenne, Wyo	10.00
All points between Denver and Missouri River	8 85

THE ARMSTRONG MFG. COMPANY at 242 Canal street, New York, report a little spurt in business at the present time. Their recent novelties in Pipe Cutting Machinery attract considerable attention, while the Rapid Transit Pipe Wrench and Rapid Transit Pipe Cutter are both appreciated to the extent of numerous orders.

THE RICE & WHITACRE MFG COMPANY'S stock, machinery, tools, fixtures, patents, &c., are offered for sale by the receiver, F. B. Dyche, at 43 to 47 South Canal street, Chicago. Bids will be received up to 12 o'clock noon on the 20th inst.

THE P. H. & F. M. ROOTS COMPANY of Connersville, Ind, who have been makers of rotary blowers for 33 years, have recently established a branch office in Chicago at 501 Manhattan Buildin

CONDITION OF THE

Hardware Trade.

NOVEMBER opens with some indications of improvement, although the volume of business is not, on the whole, materially increased. A goodly number of small orders have been coming in to merchants' and manufacturers' representatives in this market, indicating something of a quickening in the demand and a disposition on the part of the trade, especially of the retail trade, to purchase a little more freely. The advance of the season, however, has its effect in restraining trade. As usual at this time of the year, there is more or less falling off in the volume of business. It is evident that stocks in the hands of retailers are unusually limited, the character of the orders showing that assortments are pretty well depleted. The policy which has been pursued for the past few months of limiting purchases to such goods as are absolutely required is still adhered to, and a very conservative spirit dominates the whole conduct of business. While the effect of this is to curtail trade for the present, it is unquestionable that this is the safest and wisest course, and tends to put business on a solid basis, averting serious disaster and laying the foundation for future prosperity.

Advices from Chicago.—No improvement is perceptible in the Shelf Hardware trade. Perhaps in a few departments there may be some little increase in the volume of business, but the aggregate shows a decline rather than an increase. If trade continues in this way during the month of November the volume of business will be considerably under that of October. The decline is not attributed so much to lack of demand, however, as to hesitation in extending credits. Jobbers state that opportunities are offered them to sell considerable quantities of goods to new customers or to parties whose financial standing is not of the best. The better class of merchants, whose credit is high, buy quite sparingly and are very conservative. The demand for Tin Plate and tinners' stock is much better than it has been, but the improvement is not enough to make merchants feel elated over the change. It is simply a movement in the right direction, which they welcome. Jobbers of Heavy Hardware are still in receipt of good business from consumers of Iron and Steel, like the Implement manufacturers, and also report a little better demand from out of town wagon builders. City trade is quiet.

Notes on Prices.

Wire Nails.—The Wire Nail market continues in substantially the same condition as last week. It is represented by the quotation of $1.20 to $1.25 for carload lots at mill, the former figure being obtainable on good orders. There has been a fair demand and most of the mills are well occupied.

Advices from Chicago. — Manufacturers of Wire Nails report business as keeping up about the same as it has been for the past week or two. They are quoting $1 32½ here for factory lots, but this is now the price for ordinary lots to which the general market has settled. Small lots from stock have receded to $1.45 on account of the lower prices from factory.

Cut Nails.—There is only a moderate inquiry for Cut Nails and the market does not show an increase of strength in price, quotations being on a basis of 95 cents to $1 for carload lots at mill. Concessions are made in special cases. The New York price for small lots from store is $1.20 to $1.25.

Advices from Chicago.—A better inquiry and more sales than the previous week is the report received from manufacturers of Cut Steel Nails. Low freights to the Southwest are having an important influence on their business at present. Some quite large lots are under negotiation. Prices are still quoted at $1.20 to $1.25, Chicago, for factory lots, while small lots from stock are unchanged at $1.30.

Barb Wire.—There are indications of a slight increase in the volume of business in Barb Wire, but trade is on the whole sluggish and unsatisfactory. Quotations continue on the basis of $2 15 for carload lots of Four-Point Galvanized at mill, but this price has been shaded. Manufacturers are solicitous to obtain orders and as a result quotations are somewhat uneven.

Advices from Chicago.—The Barb Wire trade has picked up to some extent, although the demand is considerably less than manufacturers would like to experience at this time of the year. A better outlook is now offered for trade with the Southwest, owing to the low freight rates. This is having its effect on trade, as it comes in addition to the better impulse in the West and Northwest. Prices continue as before on a basis of $2.40, Chicago, for Galvanized in carload lots, and $2.55 for small lots from stock. The demand for Plain Wire has increased rapidly within the past two weeks. Manufacturing establishments consuming Wire have started up quite generally, and some of them are running to their usual capacity in ordinary times. The manufacturers of Mattresses are particularly prominent in this better condition of business, but the implement makers and others who consume Wire to considerable extent are also more inclined to buy than for several months, and are placing good contracts with the manufacturers.

Brace Bit Gauge.—The Wilks & Whitus Brace Bit Gauge, for which T. G. Ellsworth, 85 Chambers street, New York, is agent, is sold to the trade at $9 per dozen net.

Sheet Zinc.—Under date November 3, Matthiessen & Hegeler Zinc Company, La Salle, Ill., issue a revised price-list and discount sheet of Sheet Zinc, quoting the advanced price of $4.50 per 100 pounds in 600-pound casks of the thicknesses between Nos. 9 and 15, inclusive, and of the widths between 32 and 46 inches and of the lengths between 84 and 90 inches. They also announce the following revised extras in cents per 100 pounds:

Extras in Cents per 100 Pounds.

Nos.	5	6	7	8	9	10	11	12	13	14	15
32 to 40 x 84	75	45	30	10	.....	.....	.....	.....	.....	.....	.....
32 to 46 x 84 to 90	....	....	....	....	none	none	none	none	none	none	none
52 x 84	....	....	225	95	80	65	45	45	45	45	50
50 x 84	...	....	150	75	50	30	20	20	20	25	25
48 x 108	...	....	120	85	75	50	20	20	20	25	25
48 x 96	....	....	100	45	40	20	15	15	15	20	20
48 x 84	255	135	85	25	20	10	10	10	10	10	10
36 x 108	160	140	75	40	35	25	20	20	20	25	25
36 x 96	135	65	40	25	20	10	10	10	10	10	10
30 x 84	110	70	50	25	15	15	10	10	10	10	10
28 x 84	120	80	60	35	25	25	25	25	25	25	25
26 x 84	140	90	70	40	35	25	25	25	25	25	25
24 x 84	150	110	85	20	15	05	05	05	05	05	05

The extra on No. 4 36 x 84 is $1.35 per hundred pounds.

The following are the charges for small lots:

In casks of 100 pounds (all Nos. up to and including No. 12), 30 cents extra per 100 pounds.

In boxes of 100 pounds (not larger than 30 x 40 inches), 30 cents extra per 100 pounds.

In 200 and 300 pound casks (all Nos. up to and including No. 14), 20 cents extra per 100 pounds.

In 200 and 300 pound boxes (not larger than 36 x 50 inches), 20 cents extra per 100 pounds.

The discounts announced are as follows:

Discounts.	First class. 15 600-pound casks and upward.	Second class. 10 to 14 600-pound casks.	Third class. 5 to 9 600-pound casks.	Fourth class Under 5 600-pound casks.
	Per cent.	Per cent.	Per cent.	Per cent.
Special	0	0	0	0
Cash with order	3	3	3	3
Quantity	3	2	1	0
Total	6	5	4	3

It is stated that all discounts are computed straight when money accompanies the order and the quantity discount is added to the special discount in all cases. The prices thus announced are subject to change without notice.

Old Metals.—The demand for Old Metals is extremely light, low prices being, seemingly, no inducement to purchasers to lay in more material than they absolutely need. Prices in the New York market are nominally unchanged at the quotations given below, but these depend largely upon the conditions of sale, quantity, terms of settlement, &c. The following fairly represent those now ruling:

Heavy Copper	℔ 6¾¢
Light and Tinned Copper	℔ 6¼¢
Heavy Brass	℔ 5¼¢
Light Brass	℔ 4⅛¢
Lead	℔ 3¢
Tea Lead	℔ 2½¢
Zinc	℔ 2½¢
No. 1 Pewter	℔ 14¢
No. 2 Pewter	℔ 6¢
Wrought Scrap Iron....℔ gross ton	$9.00 @ $10.00
Heavy Cast Scrap....℔ gross ton	9.00 @ 10.00
Stove Plate Scrap....℔ gross ton	.... @ 5.60
Burnt Iron (delivered at mill) ℔ gross ton	.... @ 4.00

Old Rags, Paper, &c.—No quotable improvement has developed in the market for these materials, which remains dull at unchanged prices. Quotations for New York delivery are as follows:

No. 1 White Rags	℔ 3¼ @ 3½
No. 2 White Rags	℔ 2¼ @ 2½¢
Mixed Rags	℔ ¾¢
Blues and 3ds	℔ 1 @ 1¼¢
Hard Sized White Shavings	℔ 2¼ @ 2½¢
No. 1 White Book Shavings	℔ 2 @ 2¼¢
No. 2 White Book Shavings	℔ 1 @ 1⅝¢
Light Book Shavings	℔ ¾¢
No. 1 Mixed Shavings	℔ ¾ @ 1 ¢
No. 2 Mixed Shavings	℔ ½ @ ¾¢
No. 1 Printed Books	℔ 1 @ 1¼¢
Ordinary Mixed Books	℔ ½ @ ¾¢
Newspapers	℔ 3-5¢
No. 1 Manila Paper	℔ ⅞ @ 1 ¢
No. 2 Manila Paper	℔ ⅝ @ ¾¢
Bogus Paper	℔ ½¢
Common Paper	℔ ⅜ @ ½¢
Straw Chips	℔ ½ @ ⅝¢
Binders' Clippings	℔ ½ @ ⅝¢
Jute Butts	℔ 1½ @ 1¾¢
No. 1 Jute Bagging	℔ 1 @ 1¼¢
Mixed Bagging	℔ ¾ @ 1 ¢
No. 2 Bagging	℔ ½ @ ¾¢
Hemp Twine	℔ 2¼¢
Manila Rope	℔ 2½¢
Jute Rope	℔ 1½ @ 1¾¢
Mixed Rope	℔ ¾ @ ⅞¢

Old Rubber.—Market dull and prices weak and low, being about as follows:

Car Springs, ton lots, ℔ lb.	@ $0.03¼
Rubber Shoes, carloads, delivered at factory, ℔ lb..	@ .03
Rubber shoes, less than carloads, ℔ lb	0.02¼ @ .03⅛
Large Hose, ℔ ton	@ 9.00
White Wringer Rolls, ℔ lb.	@ .04¼
White Syringes, ℔ lb	@ .05

THE MANAGERSHIP of the Chicago branch of the Lalance & Grosjean Mfg. Company of New York, rendered vacant by the lamented death of Julien P. Cordier, has been filled by the appointment to that position of Charles W. Hyde. Mr. Hyde, who is widely known and esteemed in the hardware and house furnishing trades, has been connected with the Lalance & Grosjean Company for several years, having represented their interests for a considerable period in the Southern States and recently in the territory lying between New York and Chicago.

Factories for the manufacture of tinware show a considerable increase, both in number and volume of production, by last reports from Victoria, Australia.

HEATING AND PLUMBING.

NEW WORK AND CONTRACTS.

B. H. KELLY of Birmingham, Conn., is putting in a hot water heating apparatus in the conservatory at the St. Mary's Parochial residence.

S. J. MARSHALL of Kearny, N. J., has been awarded the contract for $625 for furnishing a steam heating plant for the church and Sunday school building of Christ Church at that place.

T. F. MCCORMICK is the proprietor of a plumbing establishment just opened at 6 Mill street, Newport, R. I. For many years he was in the employ of Joseph Haire of the same city.

THE BAKER & SMITH COMPANY, 193 to 197 Van Buren street, Chicago, are to furnish a horizontal tubular boiler and necessary radiation for steam heating in the Speer apartment building, Joliet, Ill.

THE ILLINOIS HEATING COMPANY, 88 Lake street, Chicago, have been awarded the contract for steam heating in the North Side Masonic Temple, North Clark street. A horizontal tubular boiler and American radiators will be used.

GEORGE R. ESTABROOK, Springfield, Mass., has recently been awarded the contracts for heating the following buildings, using two Richmond Sectionals and five Victors: First Congregational Church and Chapel, Holyoke; Asbury M. E. Church and parsonage, and Christ Church rectory of Springfield; parochial residence of Rev. J. J. O'Keefe, Merrick, and parochial residence of Rev. F. F. Fallon, Hunting ton, all in Massachusetts.

PHILLIPS, DOUP & CO., Brooklyn, are using a Novelty Circulator to replace an old apparatus that was used in connection with an indirect stack in a large flue, from which an entire building was heated.

J. F. MULVEY, Woonsocket, R I., has been awarded the contract for heating the Hotel Clarendon, at Millville, Mass., using an Eleven Section Richmond for the purpose.

THE HANNIBAL PLUMBING COMPANY, Hannibal, Mo., have been awarded the contract for furnishing the gas fixtures for the new Baptist Church Building at Hannibal, Mo.

THE TRUSTEES of the Hubbard Free Library have contracted with A. D. Ward, Augusta, Maine, to equip the building with a heating system, and have selected the Capitol hot water heater sold by Gilchrist & Taylor of Boston.

TAYLOR & TAYLOR of Meriden, Conn., have recently completed a job of hot water heating in the residence of E. E. Spencer. They used a Victor boiler. The radiators were finished in crimson, orange and gold to harmonize with their surroundings.

THE PORTER HEATING COMPANY of Minneapolis, Minn., have the contract for placing a steam heating plant in the Court House at Cookston, Minn.

THE MARCH-BROWNBACK STOVE COMPANY of Pottstown, Pa., report that their Crown steam boilers have been selected for heating the Reformed Church at Macungie, Pa., the residences of Levi Fritch, Metztown, Pa., Freeman Borneman, Bechtelsville Pa., and dealers Charles Bieler, Pen Argyle, Pa., and McCommon & Smith, Oxford, Pa., are using them in their own residences.

J. FRANK BOYER, Norristown, Pa., has the contracts for heating the residences of the following persons: Patrick Curren and Martin Hunsberger, Norristown; Clarence V. Gardner and Mr. Haywood, Cynwyd, Montgomery County, Pa. Also Dr. D. Z. Hillegass, Mantua, N. J. The Boyer, Mercer and O. K. boilers will be used on the above work.

AN ORDER has been placed with W. H. Mackay, manager of the steam and hot water heating department at New York of Hart & Crouse, Utica, N. Y., for Royal steam boilers to be used in heating ten greenhouses at Long Island City, N. Y. Two Royal hot water heaters will be used in the new church and the priest's residence of the Redemptorist Fathers at Fifth avenue and Fifty-ninth street, Brooklyn, N. Y.

GEO. B. COBB & CO., 42 Duane street, New York, are installing a steam heating plant at Brown's Opera House, at Stamford, Conn. The Florida boiler is used, and both direct and indirect radiation are employed.

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Metal and Miscellaneous Prices.

CHICAGO, NOVEMBER 9, 1893.

Tin—

Straits pigs.....23¢

Imported Tin Plates—

Charcoal Plates.—Bright.

Guaranteed Plates command special prices, according to quality.

		Per box.
Calland and MelynGrade	IC, 10 x 14	@ $6.75
	IC, 12 x 12	@ 6.75
	IC, 14 x 20	@ 6.75
	IC, 20 x 28	@ 13.50
	IX, 10 x 14	@ 8.75
	IX, 12 x 12	@ 8.75
	IX, 14 x 20	@ 8.75
	IX, 20 x 28	@ 17.50
	DC, 12½ x 17	@ 6.50
	DX, 12½ x 17	@ 8.50
Allaway Grade,	IC, 10 x 14	@ 6.50
"	IC, 12 x 12	@ 6.50
"	IC, 14 x 20	@ 6.50
"	IC, 20 x 28	@ 13.00
"	IX, 14 x 20	@ 8.00
"	IX, 20 x 28	@ 16.00

Coke Plates—Bright.

	Per box.
Steel Coke—IC, 10x14.14x20.	$5.75 @$5.85
IC, 14x20.90 ℔	5.50 @ 5.60
IC, 14x20, 100℔	@ 5.85
10 x 20	8.75 @ 9.00
20 x 28	11.50 @12.70
X, 10x14, 14 x 20	@ 7.35
B.V. Grade. IC,10x14, 14x20.	5.85@ 6.00

Charcoal Plates.—Terne.

Guaranteed Plates command special prices, according to quality.

Mansel and Dean Grades.—	
IC. 14 x 20	@ $5.62½
20 x 28	@ 11.25
IX. 20 x 28	@ 14.25
Worcester Brand and equal.—	
IC, 14 x 20..	6.12½@ .....
IC, 20 x 28..	12.25 @ .....
IX, 14 x 20..	7.62½@ .....
20 x 28..	15.25 @ .....

American Tin Plates.

Charcoal Plates.—Bright.

Irondale, A. A.—	IC, 14 x 20	$7.00
" "	IX, 14 x 20	9.00
" "	IXX, 14 x 20	11.00
" "	IC, 20 x 28	14.00
" "	IX, 20 x 28	18.00
" "	IXX, 20 x 28	22 00
Florence.—	IC, 10 x 14, 12 x 12, 14 x 20..	6.75
	IX, 10 x 14, 12 x 12, 14 x 20..	8.50
Palma.—	IC, 10 x 14, 12 x 12, 14 x 20..	7.25
	IX, 10 x 14, 12 x 12, 14 x 20..	9.25

Each extra cross $2.00 and 20 x 28 double these prices.

Brilliant, Tissue Packed, IC, 14 x 20.	$9.25
Royal ,extra, IC, 14 x 20	7.25
Merion, IC, 14 x 20	7.00
Almond, IC, 14 x 20	6.50
Mint, IC, 14 x 20	6.25

Coke Plates.—Bright.

Elwood.—IC, 14 x 20	$6.00
" IC, 20 x 28	12.50

Roofing Plates.

Arch, IC, 20 x 28	@$11.75
Crescent, IC, 20 x 28	@ 12.25
Crescent, IX, 20 x 28	@ 15.25
Empire, IC, 20 x 28	@12.50
Empire, IX, 20 x 28	@15.50
Hickory, IC, 20 x 28	@ 12.75
" IX, 20 x 28	@ 15.75
Alaska (heavily coated), IC, 20x28	@$14.50
Alaska IX, 20 x 28	@ 17.75
Special, IC, 20 x 28	@ 15.50
" IC, 20 x 28	@ 18.50
Merchant's Roofing (extra coated), IC, 20 x 28	@$17.75
Merchant's Roofing (extra coated), IX, 20 x 28	@$21.50
Merchant's Old Method, (extra heavily coated), IC, 20 x 28	@$19.75
Merchant's Old Method (extra heavily coated), IX, 20 x 28	$23.60
Irondale A :	
IC, 14 x 20	$6.25
IX, 14 x 20	7.75
IC, 20 x 28	12.50
IX, 20 x 28	15.50
Westmoreland :	
IC, 14 x 20	$6.25
IC, 20 x 28	12.50
Elwood :	
IC, 20 x 28	$12.00
Juno :	
IC, 14 x 20	$5.75
IC, 20 x 28	11.50
Illinois, Old Method :	
IC, 20 x 28	$17.00
E. L.:	
IC, 20 x 28	$12.50
Jessie :	
IC, 20 x 28	$12.00
Scott's Extra Coated, Stamped and Resquared, IC, 14 x 20	$9.50
Scott's Extra Coated, Stamped and Resquared, IX, 14 x 20	11.00
Scott's Extra Coated, Stamped and Resquared, IC, 20 x 28	19.00
Scott's Extra Coated, Stamped and Resquared, IX, 20 x 28	22.00
Neville, Stamped, IC, 14 x 20	6.25
" " IX, 14 x 20	7.50
" " IC, 20 x 28	12.50
" " IX, 20 x 28	15.00
Taylor's Old Style, IC, 14 x 20 (Stamped and Resquared)	$9.50
Taylor's Old Style, IC, 20 x 28 (Stamped and Resquared)	19.00
Taylor's Roofing, IC, 14 x 20 (Stamped and Resquared)	8.25
Taylor's Roofing, IC, 20 x 28 (Stamped and Resquared)	16.50
Columbia, IC, 14 x 20 (Stamped)	7.25
" IC, 20 x 28 (Stamped)	14.50
Maple, IC, 14 x 20 (Stamped)	6.75
" IC, 20 x 28 (Stamped)	13.50
Willow, IC, 14 x 20	6.50
" IC, 20 x 28	13.00
Knoxall, IC, 14 x 20	6.25
" IC, 20 x 28	12.50
Globe, IC, 14 x 20	6.00
" IC, 20 x 28	12.00
Miami, IC, 14 x 20	6.00
" IC, 20 x 28	12.00
" IX, 20 x 28	15.00
" (Redipped), IC, 20 x 28	17.00

Tin Boiler Plates.

	Per box of 100 sheets.	Per box of 112 sheets.
X, 14 x 28	$13.00	$13.00
XX, 14 x 28	14.50	14.50
X, 14 x 31	14.50	15.80
XX, 14 x 31	16.50	17.50
X, 14 x 56	29.50	16.50
XX, 14 x 56	32.50	18.20
X, 14 x 60	31.50	17.65
XX, 14 x 60	35.50	20.90

Sheet Iron—

Black.

	Common American	Refined.
Nos. 10 to 16	℔ 2 6 10¢	3 2-10¢
17 to 20	℔ 2 7-10¢	3 3 10¢
21 to 24	℔ 2 8-10¢	3 4-10¢
25 and 26	℔ 2 9-10¢	3 5 10¢
27	℔ 3¢	3 6 10¢

Russia, Planished, &c.

Genuine Russia, all numbers....13¢ net.
Patent Planished....℔ A, 10½¢; B, 9½¢
dis. 5%
Craig's Polished Sheet Steel.....8½¢

Galvanized.

Juniata or first quality.....dis. 70&5%

Copper—

Ingot.

Lake.....11¾¢ @ 12¼¢
Casting Brands.....11¢ @ 11⅝¢

Sheet and Bolt.

Discount, 25%.

Copper Bottoms.

Discount, 25%.

Seamless Brass and Copper Tubes.

Base price, 17½¢, Chicago, with extras according to size.
Copper, Bronze and Gilding Tube, 3¢ ℔ additional.

Brazed Brass Tubing.
(To No. 20 inclusive.)

Add freight from New York to Chicago to these prices, or 50¢ ℔ 100 ℔.

Above 5-16 inch to 3 inch inclu...	35¢
Plain, above 3 inch	45¢
Plain, 5-16 inch	45¢
Plain, ¼ inch	60¢
Plain, 3-16 inch	$1.00
Plain, ⅛ inch	$1.50
Fancy Tubing, Brass, to No. 20 incl	43¢ ℔
Bronze Tubing, 3¢ ℔ more than Brass	

40 @ 45%

Roll and Sheet Brass.

Discount, 35 @ 40%.

Slab Spelter—

Western Spelter.....5

Sheet Zinc—

600 ℔ casks.....5 ¢
300 ℔ casks.....5¼¢
Loose sheets.....5½¢

Lead—

Soft Pig Lead.....4¢
Bar.....4½¢
Pipe.....5½¢, dis. 10¢
Block Tin Pipe.....35¢
Sheet.....6¢, dis. 10%

Solder—

½&½.....12¾¢@13¼¢
Extra Wiping.....11½¢

The prices of the many other qualities of Solder in the market indicated by private brands vary according to composition.

Antimony—

Cookson.....12¼@12½¢
Hallett's.....11¼¢@11½¢

Wrought-Iron Pipe—

List on following page.

1¼ and under, Plain	57½&10%
1¼ and under, Galv	52½&10%
1½ and over, Plain	67½&10%
1½ and over, Galv	60&10%
Boiler Tubes, list Oct. 24, 1892	65@67½%
Casing, list Nov. 16, 1892	52½%
Inserted Joints Casing, list Nov. 16, 1892	47½%
Steel Boiler Tubes	27½%
Cold Drawn Seamless Steel Tubing	50%

Cast-Iron Soil Pipe—

Cast-Iron Soil-Pipe, Tarred; sizes 2 to 6 inches, inclusive.....dis 70&2½%
Other sizes.....dis 60%

Leader Pipes—

Abendroth's Galv. Spiral Riveted	60%
Austin's Corrugated	60%
Gordon & Gilbert's Corrugated	60%
Ritchie's (Galv. Iron only) Cor'd	60%
Ritchie's Spiral Lock Seam, Galv'd	55%
Austin's Spiral Ribbed Pipe	60%
Plain Adjustable Elbows	60%
James A. Miller Bros. (Galv'd Iron only) Corrugated	60%

Furnace Fittings—

Discount from Excelsior Steel Furnace Co.'s list.....50%

Steel Roofing—

Perfection	$3.75 square
Climax	$3.50 square
The Lloyd Spanish Tiling	$4.50 square

Metallic Shingles—

Cushman's	$1.25 square
Merchant & Co.'s Spanish Tiles :	
Copper, 14 oz	$36.00 square
Tin	$9.75@$14.25 square
Steel, painted	$9.00 square

Drain Pipe—

Discount from list.....50%

Paints Oils, &c.—

Deodorized Benzine	7½@8 ¢
Iron Paint, Bright Red	℔ D, 2 ¢
" " Brown	℔ D, 1½¢
" " Purple	℔ D, 2½¢
" Ground in oil, B. Red	℔ D, 6½¢
" Ground in oil, Red	℔ D, 6½¢
" Ground in oil, Brown	℔ D, 5½¢
" Ground in oil, Purple	℔ D, 6 ¢
Linseed Oil, Boiled, in bbls	40¢
Linseed Oil, Raw, in bbls	37¢
Mineral Paints	2@4¢
Orange Mineral	10½¢
Pure White Lead in Oil	6¾@7½¢
Dry White Lead in bbls	6½@6¾¢
Red Lead, American	7@7½¢
Red Venetian, English, dry	$1.65@$1.70
Red Venetian in oil; asst'd cans, kegs	8½¢ ; 7½¢
Sipe's Japan Oil, in bbls, ℔ gal	34¢
Spirits Turpentine, in bbls., ℔ gal.	35½¢
Asphaltum, Trinidad Refined, ℔ ton	$45
Tarred Felt, 1 Ply, ℔ 100 ℔	$1.60
Tarred Felt, 2 Ply, ℔ roll 108 sq. feet	$1.25
Tarred Felt, 3 Ply, ℔ roll of 108 sq. feet	$1.70
Roofing Pitch, ℔ bbl. of 300 ℔	$3.00

NEW YORK, NOVEMBER 10, 1893.

The following quotations are for small lots.

Aluminum—

No. 2 Grade Metal, in ton lots..℔ D, $0.75
No 1 (guaranteed to be 98 % pure and over), in ton lots.....℔ D .90
Lots less than 1 ton, 10¢ ℔ D additional.

Antimony—

Cookson.....℔ D, 11¢
Hallett's.....℔ D, 10¼¢@10⅜¢

Brass—

Planished.....net
Roll and Sheet.....35@40%

Brass and Copper Tubes

Brazed Brass Tubing—

List May 20, 1889.

	Per D.
Plain, to No. 20 inclusive, above 5-16 inch to 3 inch inclusive	$0.35
Plain, to No. 20, above 3 inch	45
Plain, 5-16 inch to No. 20	45
Plain, ¼ inch	60
Plain, 3-16 inch	1.00
Plain, ⅛ inch	1.50
Fancy Tubing to No. 20, inclu	43

35@40%

Copper and Bronze Tubing—

3¢ ℔ D more than brass.

Bronze, Tobin—

Drawn Rods for Bolts, Forgings, &c

Over ¼ to 3½ inches inclusive....17¢ ℔ D
Over 3½ to 5 inches inclusive.....18¢ ℔ D

Piston Rods, Finished True, Smooth and Straight.

Over ¼ to 3½ inches inclusive....18¢ ℔ D
Over 3½ to 5 inches inclusive.....19¢ ℔ D

Clips—

Buffalo Damper: Nos. 1, $1.25; 2, 2.50 per doz.....40&10%

Conductors—

Corrugated. *Round or Square—*

Galvanized.....60%
Galvanized, Locked Joints.....60%
Tin.....60%

Spiral Riveted—

Galvanized.....50%

See also *Elbows and Shoes; Eave-Trough Miters; Strainers, Conductor.*

Conductor Strainers—See *Strainers, Conductor.*

Copper—

Bottoms, Pits and Flats....25@25&5%

Ingot.

Lake.....11¢
Ansonia Grade Arizona.....10½¢
Ansonia Grade Casting.....10¢
Planished.....net
Sheet and Bolt.....25&25&5%

Tubes—See *Seamless Brass Tubes.*

Coppers, Soldering—

See *Irons, Soldering*, in Current Hardware Prices.

Damper Clips Buffalo—

See Clips, Buffalo Damper.

Eave Troughs—

Lap or Slip Joint, Galvanized.....60&10%
Lap or Slip Joint Terne.....60%

Eave-Trough Mitres—

Lap or Slip Joint.....list, net

Elbows—

Plain Adjustable—

Tin.....70%
Galvanized.....70%

Crimped Tubing—

Re-Tinned or Galvanized.....35%

Stove-Pipe—

Buffalo Four-Piece.

4½	5	5½	6	7 inch,
$0.78	.87	.90	.99	1.20 per doz..20 %

Elbows and Shoes—

Flat Crimp.

Tin.....35%
Galvanized.....35%

Corrugated.
Flat Crimp.

Galvanized.....60%

Round or Square.

Tin.....60%
Galvanized.....60%

Iron, Sheet—

Black.

	Common American.	R. G. Cleaned American.
Nos. 10 to 16	℔ D, 2¾	3 10¢
Nos. 17 to 20	℔ D, 2.85	3.10¢
Nos. 21 to 24	℔ D, 2.90	3.20¢
Nos. 25 and 26	℔ D, 3.05	3.30¢
No. 27	℔ D, 3.15	3.40¢
No. 28	℔ D, 3¼	3½¢
American B. B.	℔ D,	4¢@4½¢

Russia, Planished, &c.

Genuine Russia, according to assortment.....℔ D, 11¾@12½¢
Patent Planished....℔ D, A, 10¢; B, 9¢, 5%
Craig Polished Sheet Steel.....℔ D, 8½¢

Galvanized.

	B. B.
Nos. 10 to 16	@ 25&70%
Nos. 17 to 22	
Nos. 23 to 24	
Nos. 25 to 26	
No. 27	
No. 28	
Nos. 29 and 30	

Filter Joints—

Lee's.....33⅓

Lead—

American Pig	4¢@4⅛¢
Bar	4½¢
Pipe	6¼¢, 20%
Tin Lined Pipe	16¢, 20%
Block Tin Pipe	37½¢, 20%
Sheet	7¢, 20%

Old Lead in exchange, 3¼¢ ℔ D.

Metal Expanded—

Manufacturers' list No. 5.

Lathing	10%
Fencing, Painted Sheets	20%
Netting, Painted Sheets	20%
Door Mats, Galvanized	25%
Window Guards, Paneled	15%
Tree Guards, Paneled	15%

Mitres Eave-Trough—See *Eave-Trough Mitres.*

Paints Oils &c.—

Lead, Amn. White, in oil	6¾ @ 7¼
Lead, Red, bbls. and ⅗ bbls	6½ @ 7
Lead, Red, kegs	6½ @ 7
Ocher, American	1 @ 1½
Red, Venetian, American	1½ @ 2½

Linseed Oil:
Raw, ₩ gal..... @ .40
Boiled..... @ .43

Spirits Turpentine:
In bbls..... @ .32

Putty:
In barrels and ½ bbls..... .01¾ @ .01¾
In tubs..... .01⅝ @ .01¾
In tin cans..... .01½ @ .02¼
In bladders..... .01⅞ @ .02¼

Roofing Material, &c.:
Asphaltum, Trinidad Refined, ₩ ton..... $30.00@$35.00
Asphaltum, Rock, ₩ ton..... $14.00
Coal Tar Felt, 1 Ply, ₩ ℔..... 2¢
Coal Tar Felt, 2 Ply, ₩ roll 108 sq. ft. $1.42½
Coal Tar Felt, 3 Ply, ₩ roll 108 sq. ft. $1.85
Roofing Pitch, ₩ bbl..... $2.75

Pipe, Drain 50%

Pipe and Fittings, Cast Iron Soil—

Cast-Iron Soil Pipe, Tarred, sizes 2 to 6 Inches, inclusive.....60@60&10%
Other sizes.....55@55&10%
Cast-Iron Fittings, Tarred, sizes 2 to 6 inches.....60@60&10%
Other sizes.....55@55&10%

Pipe, Spiral—

Galvanized.....60%
Tin.....60%

Rock and Slag Wool—

	₩ ℔	₩ cub. foot
Slag Wool, ordinary	1¼	15¢
Slag Wool, extra	4¼	38⅛¢
Rock Wool, ordinary	2¼	27¢
Rock Wool, extra	7¼	43⅛¢

Rosin—

Common and Good—Strained.
Rosin, C. & D.....₩ bbl. $1 32 @$1.35
Rosin, E. & F.....₩ bbl. $1.45@$1.55
Rosin, G. & H.....₩ bbl. $1.65 @$1.80
Rosin, I. & K.....₩ bbl. $2.15@$2.65
Rosin, M. & N.....₩ bbl $3.10@$3.85

Seamless Brass Tubes..net

Shoes and Elbows—See *Elbows and Shoes.*

Slate Roofing—

According to size, f.o.b. cars, Quarry Station.

Pennsylvania:
Best Bangor, ₩ sqr.....$3.25@$4.50
Pen Argyle, ₩ sqr.....3.50@ 4.25
Peach Bottom, ₩ sqr.....5.00@ 6.25
No. 1 Chapman, ₩ sqr.....4.00@ 4.65
Lehigh Slates, ₩ sqr.....3.00@ 4.50
Vermont:
Sea Green, ₩ sqr.....2.70@ 3.20
Purple, ₩ sqr.....3.50@ 4.50
Unfading Green, ₩ sqr.....3.50@ 4.00
Red, ₩ sqr.....9.75@12.00

Solder and Soldering Fluids—

Solder—

½ & ½..... 13⅜@14½¢
No. 1..... 11¾@12 ¢
Prices of Solder indicated by private brands vary according to composition.

Soldering Fluids—

Concentrated Soldering Flux.
f.o.b. New York.
In barrels, ₩ ℔.....4¢
Smaller quantities, ₩ ℔.....5¢

Gedney's Soldering Fluid.
In carboys or barrels, ₩ ℔.....2¢
$1.50 for carboy or barrel; money refunded when returned.

Perfection Soldering Flux.
No charge for package.
Bbls., about 500 ℔, ₩ ℔.....3½¢
½ bbls., about 300 ℔, ₩ ℔.....4¢
Kegs, about 110 ℔, ₩ ℔.....4¢
75¢ extra for keg.
Kegs, about 55 ℔, ₩ ℔.....4¢
5% dis.

Yager's Soldering Salts.
¼-℔ bottles, each.....30¢
Large quantities, per ℔.....40¢

Spelter—

Western Spelter.....4¼¢@4⅝¢
Bertha.....8¾¢@9¢

Spiral Pipe—See *Pipe, Spiral.*

Stove-Pipe Elbows—*See Elbows, Stove Pipe.*

Stove Polish—See *Polish, Stove.*

Stove Trucks—See *Trucks, Stove.*

Strainers Conductor—

Galvanized.....60%

Tin, Pigs and Bars—

Banca, pigs, ₩ ℔.....22½¢
Straits, pigs, ₩ ℔.....22¢
Straits in bars, ₩ ℔.....23¢

Tin Plates—

American Terne Plates—

Alaska (re-squared) IC, 14 x 20.....$7.00
Alderly, extra quality, IC, 14 x 20..6.37½
Allegheny, IC, 14 x 20..... 6 12
" IX, 14 x 20..... 6 38
Apollo Roofing, IC, 14 x 20..... 6.25
" " IX, 14 x 20..... 7.25
Bonus, Extra Coated, IC, 14 x 20.... 6.75
" " IX, 14 x 20 .... 8.25
Buckeye, IC, 14 x 20..... 7.00
" IX, 14 x 20..... 8.25
Chicago, IC, 20 x 28..... 11.50
Central, IC, 14 x 20..... 5.87½
Climax, IC, 14 x 20..... 5.70
Columbia, IC, 14 x 20..... 7.00
Crescent, IC, 14 x 20..... 6.00
DeMitt's First New York, IC, 14 x 20. 5.75
" First New Jersey, IC, 14 x 20 5.10
" Mohawk, IC, 14 x 20..... 5.50
Dunlap's Double Dipped, IC, 14 x 20 8.25
" " " IX, 14 x 20 9.50
" Domestic, IC, 20 x 28.... 12.00
" " IX, 20 x 28.... 15.00
Empire, IC, 14 x 20..... 6.12½
Extra Central, IC, 14 x 20..... 5.62½
Flag, IC, 14 x 20..... 5.50
Fort Pitt, IC, 20 x 28..... 11.00
Globe, IC, 14 x 20..... 5.75
Hamilton's Best Redipped, IC, 14x20 9.25
" " IX, 14x20 10.75
Hickory (Resquared), IC, 14 x 20..6.37½
Juno, IC, 14 x 20..... 5.75
Kensington, IC, 14 x 20..... 6.75
" IX, 14 x 20..... 8.00
Knoxall, IC, 14 x 20..... 6.00
Laufman's Apollo (Resquared), IC, 14 x 20..... 8.12
Laufman's Apollo (Resquared), IX, 14 x 20..... 9.37
Leominster, Extra Coated, IC, 14x20 7.75
Lion (Stamped), IC, 14 x 20..... 6.25
Lula, Best Charcoal, IC, 20 x 28....12.50
" " " IX, 20 x 28....16.00
Manhattan, IC, 14 x 20..... 7.00
Maple, IC, 14 x 20..... 6.50
Merchant's Old Method (Resquared), IC, 14 x 20..... 9.50
Merchant's Roofing (Resquared), IC, 14 x 20..... 8.50
McKinley, IC, 20 x 28..... 12.00
" IX, 20 x 28..... 15.00
Neville, IC, 14 x 20..... 6.00
" IX, 14 x 20..... 7.25
N. F. Old Style, IC, 14 x 20..... 7.50
" " " IX, 14 x 20..... 9.00
Old Colony, IC, 14 x 20..... 8.00
Optimus, Best Redipped, IC, 14 x 20 8.25
" " " IX, 14 x 20 9.50
Osceola, Hand Coated, IC, 14 x 20.. 8.25
" " " IX, 14 x 20.. 9.75
Palacio, IC, 14 x 20..... 5.55
Pennsylvania Old Method (Treble Coated), IC, 14 x 20..... 8.50
Phœnix, IC, 14 x 20..... 5.80
Scott's Extra Coated (Resquared), IC, 14 x 20..... 9.25
Scott's Extra Coated (Resquared), IX, 14 x 20..... 10.75
Taylor Old Style (Resquared), IC, 14 x 20..... 9.25
Taylor Roofing, IC, 14 x 20..... 8.00
Thomson's Puritan, IC, 14 x 20.....5.75
Tip Top, IC (Resquared), 14 x 20..... 6.62
" IX " 14 x 20..... 7.88
U. S. Monongahela, IC, 14 x 20..... 6.50
U. S. Redipped, IC, 14 x 20..... 9.25
Venux, IC, 14 x 20..... 5.80
Waldo Redipped, IC, 14 x 20..... 7.25
Westmoreland, IC, 14 x 20..... 6.25
Wilkinsburg Redipped, IC, 20 x 28.16.00
" IX, 20 x 28.19.00
Willow, IC, 14 x 20..... 6.25

American Bright Plates—

Almond, IC, 14 x 20.....$6.25
Brilliant (Tissue Packed), IC, 14x20. 9.00
Climax, IC, 14 x 20..... 6.50
" IX, 14 x 20..... 8.00
Florence, IC, 14x20..... 6.75
Hazel, IC, 14x20..... 5.80
Linden, IC, 14x20..... 6.50
Merchant's Dipped, IC, 14x20..... 11.00
Merion, IC, 14x20..... 6.75
Mint, IC, 14x20..... 6.00
Palma Xtra, IC, 14x20..... 7.25
Phœnix, IC, 14x20..... 6.25
" IX, 14x20..... 7.75
Royal, Extra, IC, 14x20..... 7.00
U. S., IC, 14x20..... 7.25

Imported Terne Plates—

Charcoal.
Dean Grade.—IC, 14 x 20.....@$5.50
20 x 28.....@11.00
IX, 14 x 20.....@ 6.75
20 x 28.....@13.50
Abercarne Grade.—IC, 14 x 20.....@ 5.40
20 x 28.....@10.80
IX, 14 x 20...@ 6.62½
20 x 28.....@13.25

Imported Bright Plates—

Charcoal.
Duty: 2.2¢ ₩ ℔.

Melyn and Cal-land Grade.	IC, 10 x 14	@$6.50
" "	IC, 12 x 12	@ 6.75
" "	IC, 14 x 20	@ 6.50
" "	IC, 20 x 28	@13.00
" "	IX, 10 x 14	@ 8.50
" "	IX, 12 x 12	@ 8.75
" "	IX, 14 x 20	@ 8.50
" "	IX, 20 x 28	@17.00
" "	DC, 12½ x 17	@ 6.00
" "	DX, 12½ x 17	@ 8.00
Allaway Grade.	IC, 10 x 14	@ 6.00
" "	IC, 12 x 12	@ 6.25
" "	IC, 14 x 20	@ 6.00
" "	IC, 20 x 28	@12.00
" "	IX, 10 x 14	@ 7.50
" "	IX, 12 x 12	@ 7.75
" "	IX, 14 x 20	@ 7.50
" "	IX, 20 x 28	@15.00
" "	DC, 12½ x 17	@ 5.50
" "	DX, 12½ x 17	@ 7.00

Coke.
Steel Coke.—IC, 10x14, 14x20.....@$5.50
10x20.....@ 8.50
20x28.11.50@12.00
IX, 10x14, 14x20.....@ 6.75
B. V. Grade.—IC, 10x14, 14x20....@ 5.50

Imported Boiler Plates.—

IXX, 14x26..(112 sheets)..... @$13.38
IXX, 14x28..(112 sheets)..... @ 14.50
IXX, 14x31..(112 sheets)..... @ 16 00

Tinning—Brass and Copper.....net

Tubing—

Tin.....55%
Galvanized.....55%

Brass and Copper.—

Standard List..... 35@40%

Troughs, Eave—See *Eave Troughs*

Trucks Stove—

Improved Lock Frame, per doz....$15.00
Steel Lock Frame, per doz..... 18 00
Daisy Improved Pattern, ₩ doz..... 18.00

Zinc—

600 ℔ casks..... ₩ ℔ 5½¢@5¾¢
Per ℔..... 6½¢

It Is Reported—

That D. G. Warfield's Hardware store, at Oakdale, Cal., was destroyed by fire on the 20th ult.

That Wm. H. Lamb recently purchased the Hardware store of E. H. Robinson, at Santa Cruz, Cal. Mr. Lamb originally hailed from Syracuse, N. Y., but for ten years he was engaged in business in South Dakota.

That there is an opening for a Hardware store at Avoca, Mich.

That J. N. Smith has sold out his stock of Hardware at Denmark, Maine, and will retire to his farm.

That H. B. Dowse, West Concord, Vt., has sold out his Tin business to R. S. Brigham.

That O. Bennion of Strykersville, N. Y., has sold his Hardware business to a new firm, under the style of Griggs, Dellinger & Ellis.

That on the 27th ult. the Hardware store and tin shop of W. G. Keith, at Brookfield, Mass., was destroyed by fire. Loss, $12,000; insurance, $6500.

That the Mead Hardware Company's store, at Swanton, Vt., was burglarized on the 21st ult., and $25 worth of goods taken.

That the Elkins Furniture & Hardware Company have been incorporated. The concern are located at Elkins, W. Va., and their stockholders are J. S. Posten, N. G. Keim, W. M. Petingale, W. B. Vana and W. G. Wilson, all of Elkins.

That the Hardware store of A. P. Boswell & Co., Coffeyville, Kan., was entered by burglars on the 31st ult., and $163 in cash, negotiable notes to the value of $5000 and certificates of deposit amounting to over $13,000 were secured. Several Revolvers and Razors were added to the booty. Mr. Boswell is the Mayor of Coffeyville.

That the Hardware store of M. J. Wilson, Penn Yan, N. Y., was entered by burglars on the 30th ult., and a large amount of Cutlery stolen,

That the new Hardware store of John Nuessle, Hamburg, N. Y., is nearly completed.

That F. C. Buell of Earlville, N. Y., and L. W. Farr of Massena, N. Y., have bought out the Hardware business of Tillotson Bros. of Earlville.

That John J. Cardwell, a Hardware merchant of Nebraska City, Neb., was married on the 24th ult. to Miss Bertha McNamar of Hiawatha. The ceremony took place at the latter point.

That the Hardware stores of Charles Halbach & Son and Foxwell & Moyle, Waterford, Wis., were robbed on the 26th ult.

That J. H. Strong has purchased at mortgage sale the Hardware stock of Mr. Woodworth, Onondaga, Mich.

That the W. H. Bartel Hardware business, at South Bend, Wash., has been disposed of to T. R. Brayton of Omaha, Neb., who took possession on October 16.

That E. H. Holmes & Co., Willimantic, Conn., will close out their stock of Stoves, Glassware, Crockery, &c. They will, however, continue the business of plumbing and house heating.

That S. S. Surdam of Oyster Bay, L. I., has removed to Hunt's Corners, Cortland County, N. Y., where he has purchased and will conduct a Hard ware store. Mr. Surdam is well known on Long Island, having served two years as school commissioner of the first district, and as such fulfilled his duties to the satisfaction of all.

That Samuel and Edward Junk have bought a two-thirds interest in the Graham Hardware Company, Rio, Ill.

Price-Lists, Circulars, &c.

HENRY B. NEWHALL COMPANY, 105 Chambers street, New York: Supplement No. 1 to catalogue of 1892, covering Coburn's Track and Hangers. The supplement illustrates and describes, with prices, Parlor Door, Barn Door, Car Door, Fire Door and Elevator Door Hangers; Store Ladder Service, Overhead Carrying Track and Automatic Fire Shutter system. Store Ladder Service is given special attention, two styles of Ladders being shown. Coburn's patent Ladders or Steps have rollers at top and bottom, with a track at the top only, and stand across the aisle. Ladders facing shelves are shown for use where there is lack of space between the counter and ledge.

WITHINGTON & COOLEY MFG. COMPANY, Jackson, Mich.: Farm and Garden Tools. Their 1894 catalogue is bound in handsomely embossed paper covers, and contains illustrations, descriptions and prices of their line of goods. The company remark that it is their aim to improve the grades of their goods where possible, and that they exercise a constant vigilance over material, workmanship and design, that there may be no deterioration in the quality of their products.

LABOR EXCHANGE.

Notices under this heading of reasonable length are inserted free of charge. Only those relating to employment are admitted. Write distinctly on one side of paper only, and do not use postal cards.

HELP WANTED.

A first-class TINSMITH; must understand all kinds of roofing and guttering, also bench and furnace work; competent to do all kinds of repairs; steady work and good wages to right man. T. W. Dorsett, 1113 Clinton street, Hoboken, N. J. Nov. 11

By a wholesale manufacturing house in Boston, a thoroughly competent and first-class HOT AIR and HOT WATER FURNACE SALESMAN to travel among the trade in New England; high grade men only need apply; a man thoroughly acquainted with the stove and range business also would have the preference; state salary desired, and give references and experience. "A. B. C.," office of *The Metal Worker*, 146 Franklin street, Boston, Mass. Nov. 11

Immediately, a good PATTERN MAKER who understands making patterns for core casting for steam and water heaters, and who can also make wood and iron patterns and do molding. H. Munson, 200 Northampton street, Easton, Pa. Nov. 11

SALESMAN, for States of Kansas and Nebraska, for a strictly first-class line of stoves: one acquainted with the trade and on a commission basis preferred; address, with all particulars, "Eclipse," office of *The Metal Worker*, 96-102 Reade street, New York City. Nov. 11

A man who thoroughly understands GALVANIZING in all its branches; wages A1. Henry Smith, office of *The Metal Worker*, Rooms 22-24 Pickering Building, Cincinnati, Ohio. Nov. 4

A first-class TINNER; one who can do all kinds of roofing and guttering and understands something about bench work, such as making stone trimmings, competent to do all kinds of repairs in the shop; must be sober, steady and reliable. M. J. Williams, 313 Main street, Baton Rouge, La. Nov. 4

A first class, sober and industrious PLUMBER who is a mechanic; can give steady work to right man; state wages and experience. "J. O. B.," office of *The Metal Worker*, 96-102 Reade street, New York. Nov. 4

A first-class TINSMITH who can furnish some capital to manufacture coolers; write for particulars. H. W. Gazley, 138 Groton avenue, Cortland, N. Y. Nov. 4

WOOD PATTERN MAKER, first-class on stove patterns, by first of December. Sarnia Stove Company, Sarnia, Ont., Canada. Nov. 4

A first-class STOVE MOUNTER; a good, steady job for a careful and neat mounter. A. Weikittel & Son, Baltimore, Md. Nov. 4

SITUATIONS WANTED.

By a young man, where he can learn high grade steam fitting; has had five years' experience at plumbing, and 1½ years at steam and hot water fitting; thoroughly honest and strictly temperate; can furnish references. H. A. Delius, Jr., 320 Patchen avenue, Brooklyn, N. Y. Nov. 11

By a first-class TIN and SHEET IRON WORKER, in New York or in the country, within 10 or 15 miles of Newark, N. J.; 15 years' experience; can also do cornice and skylight work and draw designs and cut patterns. Henry Edlstein, 59 Lewis street, New York. Nov. 11

With some good reliable stove foundry, carriage factory or jobbing house, who are desirous of being represented in Ohio, Indiana, Illinois, or further West, on salary or commission and expenses; would make immediate engagement, or for next year; A1 reference from former employer. S. I. Hoff, York, Pa. Nov. 11

By a practical mechanic, as CORNICE CUTTER, or would work at the bench; 20 years' experience; state wages. L. W. Cutter, 488 Winchester avenue, Chicago, Ill. Nov. 11

STOVE PATTERN MAKER (wood) of considerable experience desires steady work. "J. J.," 1157 Carroll street, Baltimore, Md. Nov. 11

Experienced young HARDWARE SALESMAN of ability and extensive acquaintance wishes to represent manufacturer of hardware specialties in New York, Boston and Philadelphia. "Solid," office of *The Metal Worker*, 96-102 Reade street, New York City. Nov. 11

A TINSMITH with nine years' experience and one who can furnish the very best of references regarding character, ability, &c., wants to hear of a good opening with a view of starting a tin and plumbing shop; has a good set of tools and is willing to work to make it a success. "J.," Box 1111, office of *The Metal Worker*, 96-102 Reade street, New York City. Nov. 11

Young man wants a situation as TRAVELING SALESMAN or SHIPPING CLERK with stove house; have had five years' experience; good habits; come well recommended. "W. H. G.," 142 West Third street, Williamsport, Pa. Nov. 11

By a young man 27 years of age, with 12 years' experience in tin and sheet iron work, roofing and general jobbing; can speak English and German; position desired in New York. John Fink, 640 East Ninth street, New York City. Nov. 11

By a BRASS MOLDER on plumbers' supplies of all kinds; ten years' experience; capable of taking charge; city or country. "D. N.," 214 South street, Boston, Mass. Nov. 11

A TIN and SHEET IRON WORKER, first-class in every branch, wants a steady job; sober, reliable and a hustler; will consider a good offer from anywhere; have had long and varied experience. "Tinsmith," 60 High street, Taunton, Mass. Nov. 11

By a special JOBBING WORKER at inside and outside work; heaters, furnaces, &c. Jos. Frank, 102 Delancey street, New York City. Nov. 11

In stove works, as WOOD PATTERN MAKER; have had 20 years' experience in that capacity; can make own drawings; understand making composition for ornaments; also can do turning. J. T. Tryon, 10 Broadway, Troy, N. Y. Nov. 11

By a TIN and SHEET IRON WORKER and GENERAL JOBBER; 38 years of age; position desired in the South. Forest Holb, Box 51, Maynard, Mass. Nov. 11

AGENCY wanted on commission for Milwaukee, a good selling line of hardware or specialties, advertiser having a good trade with retail hardware and department stores. 548 Fifteenth street, Milwaukee, Wis. Nov. 11

By an experienced traveling man, traveling in Pennsylvania, Ohio, Indiana, Michigan and Illinois, a good line to sell on commission to general hardware and stove dealers. "A. B. C., No. 114," office of *The Metal Worker*, 96-102 Reade street, New York City. Nov. 4

By a PLUMBER and GAS FITTER, who can also do a good job at steam and hot water fitting. "Plumber," 45 Warner street, Gloucester, Mass. Nov. 4

BOOKKEEPER, thoroughly competent young man, desires position with wholesale house. "S.," Room 9, third floor, 104 West Fourth street, Williamsport, Pa. Nov. 4

By a METAL PATTERN MAKER of 20 years' experience in locks, builders' and general hardware, iron toys and novelties; competent to take charge of pattern room. "A. H. L.," 315 State street, Bridgeport, Conn. Nov. 4

As PLUMBER and STEAM, GAS and HOT WATER FITTER; 11 years' experience; can also do good tin work; situation preferred in Southern California, Mexico or the Southern States. "M. E. M.," Box 83, Unionville, N. Y. Nov. 4

By a japanner, as FOREMAN with some first-class house in the West; understands all branches of japan business on tin, iron, wood and soft metals with one coat, also all kinds of lacquers and shades to stand the press, and all shades of colors in rubber for lithographing plates to stand the press. "Japanner," office of *The Metal Worker*, 96-102 Reade street, New York City. Nov. 4

As FOREMAN in manufactory making hardware specialties, by man with six years' experience in charge of the manufacture of freezers, toys, fruit presses, tin work, &c.; best of reference. "Edwards," Box 195, Little Valley, N. Y. Nov. 4

TINSMITH, married, wants permanent job; 20 years' experience in tin, copper, brass and sheet iron; stoves, furnaces, roofing and general jobbing; country preferred. "Tinsmith," 338 Twenty-second street, Brooklyn, N. Y. Nov. 4

A steady job by a PLUMBER who can do steam and gas fitting and estimate on plans; A1 reference. P. O. Box 1195, Morristown, N. J. Nov. 4

A young TINNER of three years' experience in hardware, stove and tin store and shop wants steady job as general man; have worked on tinware, roofing and spouting; best of habits and reference. "J. H. B," care of T. J. Reece & Co., Walkerton, Ind. Nov. 4

At once, by a strictly sober and reliable young man as an all around TIN and SHEET IRON WORKER; 11 years' experience at the business; both inside and outside work; also furnace work; a first-class slate roofer and general jobber. "L.," 27 West Holiday street, Newark, Ohio. Nov. 4

By a first-class PLUMBER; one who is a good tinsmith; have had charge of shop, sober and steady; good reference. "Plumber," 40 Clark street, Burlington, Vt. Nov. 4

By a young Englishman who has had four years' experience at plumbing and some knowledge of tin roofing; position desired where he could be under instruction for a year or two. "W. M.," 324 Goodwin street, Paterson, N. J. Nov. 4

By a WOOD PATTERN MAKER and CARVER in stove works; competent to make drawings; good reference given. "Pattern Maker," 685½ Mineral street, Milwaukee, Wis. Nov. 4

By a first-class TINNER; experienced on assortment, jobbing, roofing, guttering and furnace work; 25 years' experience. John Corbett, Paxton, Ill. Nov. 4

By a first-class TINSMITH, in the city or country; single. "K.," care of John Klein, 616 Fulton street, Elizabeth, N. J. Nov. 4

FOUNDRY FOREMAN of long experience desires a position where ability and faithful services will be appreciated; good record; distance no object. "Good Record," office of *The Metal Worker*, 96-102 Reade street, New York City. Nov. 4

On or off the road, by a thoroughly experienced stove, range, tinware and house furnishing goods SALESMAN; 12 years' experience; good reference from former employers. J. B. Smith, care of Bridgeford & Co., Louisville, Ky. Oct. 28

By a first-class stove PATTERN MAKER who can do any fine pattern work; also fine designing; can take work home if necessary. O. A. Jensen, 779 South Washtenaw avenue, Chicago, Ill. Oct. 28

As TINNER or HARDWARE CLERK; can do anything in the tinware line; strictly temperate and steady. P. O. Box 134, Akron, Ohio. Oct. 28

As PLUMBER, by young man, a graduate of the New York Trade School; has worked at trade one year; a good lead worker; best of references. "Plumber," Box 39, Moundsville, W. Va. Oct. 28

A middle-aged man would like a position as FOREMAN of stove foundry; I have had 20 years' experience as foreman, having handled from 50 to 100 men to good advantage; can furnish the very best references; will work for very reasonable salary. Jno. Ziegler, 139 Brown street, Dayton, Ohio. Oct. 28

By a TINSMITH and GENERAL JOBBER; good hand on roofing, ranges and furnaces; some knowledge of plumbing; city or country. "Tinsmith, care Mrs. Glener, 223 Christie street, New York. Oct. 28

To represent a factory or first-class jobbing house on the road in the West, by a thoroughly experienced nail, iron, steel, carriage and heavy hardware SALESMAN with over ten years' experience; wide acquaintance with factories and dealers from Mississippi River to Pacific Coast; unexceptional references; age 34. "W. S. B.," 76 Archer street, Denver, Col. Oct. 28

As TINSMITH and ROOFER. Herman Landasburg, 292 Delancey street, New York. Oct. 28

By a TINNER and CORNICE MAKER who can do general jobbing; some knowledge of plumbing. John J. Glass, Evansville, Ind. Oct. 28

By a METAL PATTERN MAKER who has worked in the best pattern shops in the country; can file and fit and do any kind of pattern work; an honest worker. J. M. Devore, 11 Delevan street, Auburn, N. Y. Oct. 28

By a first class SPINNER and IRON WORKER; 22 years' experience; can do wiring, beading and trimming. Charles Seider, 263 Floyd street, Brooklyn, N. Y. Oct. 28

By a WOOD and METAL PATTERN MAKER who is also a first-class wood turner and molder; can run almost any machine; generally handy. Madison Vorce, 15 Wood street, Auburn, N. Y. Oct. 28

As all around TINNER; have had 15 years' experience; can do all kinds of tin work inside and out of shop; am married man, sober and industrious; can come well recommended. H P. Powers, Auburn, Ind. Oct. 28

As PLATER in general job shop or bicycle factory, by a man of 14 years' experience in polishing and plating departments; understands making and keeping silver, nickel and copper solutions, also brass and silver oxidizing; can furnish best of references. H. L. Church, 159 West Washington street, Indianapolis, Ind. Oct.

THE METAL WORKER.

NEW YORK AND CHICAGO.

Saturday, November 18, 1893.

DAVID WILLIAMS, - PUBLISHER

BUSINESS OFFICES:

NEW YORK.....96-102 Reade Street.
PHILADELPHIA.....220 South Fourth Street.
BOSTON.....146 Franklin Street.
PITTSBURGH..... Room 509 Hamilton Building.
CHICAGO.....59 Dearborn Street, cor. Randolph.
CINCINNATI.....Rooms 22-24 Pickering Building.
ST. LOUIS.....Bank of Commerce Building.
CLEVELAND.....312 The Cuyahoga.

BRITISH AGENCY: The Ironmonger, 42 Cannon street, London, England.

Air Supply in Hot Blast Heating.

The most equable distribution of air and the greatest uniformity in the temperature of a building heated by the blower system certainly results from the introduction of large volumes of air at moderate temperature. But it is possible to do a thing almost too well, when results are to be compared with expenditures. In the ordinary factory, with large cubic space per operative, the air volume supplied per head frequently exceeds the provision called for in the best ventilated school house. In fact, 30 and even 50 cubic feet per minute per occupant is not at all unusual for air supply in manufactories where the work is large and the workmen separated. Now every bit of the air thus supplied at the proper temperature to maintain the warmth of the room must, under the best conditions of ventilation, be discharged through vent flues or escape through cracks, crevices and the porous walls, at the temperature of the room itself. There has thus been thrown away, so far as heating alone is concerned, as much coal as was necessary to raise the temperature of this volume of air from that outside to that inside the building. Whatever temperature the admitted air possessed over that of the room has gone toward supplying the losses by radiation and conduction through walls and windows.

A Possible Economy.

Ordinary practice in factory heating by the blower system in the northern portion of this country demands that approximately one-half of the heat added to the air must be lost by radiation and conduction, while the remainder escapes from the building with the air; or, in other words, about one-half the expense of heating could be avoided if there were no loss of air from the building. And further, the smaller the volume and the higher the temperature of the air admitted the less the cost of maintaining the required temperature within the room. To this end—when the construction of the building will permit—the supply of air may be taken from within the building and the air turned over and over. Not that all leakage or loss of air through walls will thereby be avoided, but the amount will be vastly decreased. This is not to be understood as in the least favoring the reduction of the air supply below that required for proper ventilation, but to point out in what direction economy lies, and to show that in many cases thorough ventilation can be secured with a smaller supply of fresh air than is now provided.

The Lyons Exhibition.

The main building for the international exhibition to be held next year at Lyons, France, will be a remarkable structure. From a description given in *Le Génie Civil* it appears that the building will consist of two practically distinct parts, a central dome like structure and a circular gallery running entirely round it. The dome will be 361 feet in diameter and formed by 16 parabolic half arches. These will be hinged at the bottom and each connected at the top to a circular crown. Each arch will act independently of the others. The roofs of the surrounding gallery will be carried by a peculiar form of a cantilever truss. The total weight of each main arch is stated to be 30.8 tons, and each roof truss of the galleries weighs 44 tons. The total weight of the iron work in the building will be about 2500 tons, and the area covered 9.4 acres, a trifle more than the annex to the Transportation Building at the Columbian Exposition.

A Trade School for Boston.

The decision of the trustees of the fund left by Benjamin Franklin to the City of Boston, over 100 years ago, to devote the entire sum to the erection and establishment of a trade school in that city is a matter for congratulation. The money was bequeathed by the distinguished testator to be applied to "the encouragement of young mechanics." The trustees have thus acted wisely in voting its appropriation to the purposes of a trade school, which shall bear the honored name of Franklin, as being the object best calculated to carry out the presumed wishes and intentions of that great man. The announcement is made that the school will be entirely independent of the public schools of the city, which is also a wise decision. As we have constantly maintained, the extension of the trade school movement in the larger centers of population in the United States is a great and growing necessity. No object is more worthy of the support and encouragement of those interested in the welfare and progress of American youths and in the elevation of the manual trades than the widespread adoption of such means of trade training and instruction.

Success of Trade Schools.

Wherever the trade or manual training school has been tried—provided its organization and conduct have been intrusted to the hands of capable and intelligent persons—it has been an unqualified success. Its advantages have been quickly appreciated by the class for whose benefit it has been designed; and employers of labor, many of whom were at first inclined to throw cold water on the idea, are daily becoming more and more awake to the fact that these institutions are a source from which they can draw their best supply of thoroughly prepared help. The successful careers of so many graduates from the trade schools of New York. Philadelphia and Brooklyn are the best advertisements those institutions can desire. These men act as missionaries in the different parts of the continent in which their lots are cast, and by their testimony to the benefits they have obtained are arousing an interest in the subject of better trade training in many quarters which will, doubtless, develop in time into action. So it has been in Boston, where the success of the New York and Pratt Institute trade schools has admittedly stimulated the Franklin trustees to devote their trust funds to a similar purpose. As the fund amounts to nearly half a million dollars the trustees will be able to start the new school under exceptionally favorable conditions.

An engineering feat worthy of note was accomplished a few days ago in the completion of the boring of the Busk-Ivanhoe Railway Tunnel under the Rocky Mountains, at Hagerman Pass, Col. The tunnel is close upon 2 miles long, and is bored through solid gray granite. Its accomplishment involved 3 years and 20 days' work, each day being of 20 laboring hours. The tunnel is 10,800 feet above sea level, and is on the line of the Colorado Midland Railway.

Telegraphic communication in Persia is said to work fairly well in dry weather, but in times of rain and damp it is unfortunately far otherwise. This arises from the fact that the insulators are not fixed to poles of wood or iron as with us, but are driven into trees that have branches growing round the hooks and touch the wire, thus intercepting the current. When a large tree is not available a small one is resorted to, which often breaks, or the shaking of the slender tree by the wind dislodges the insulator or hook on which it is fixed, and the wire trails on the ground.

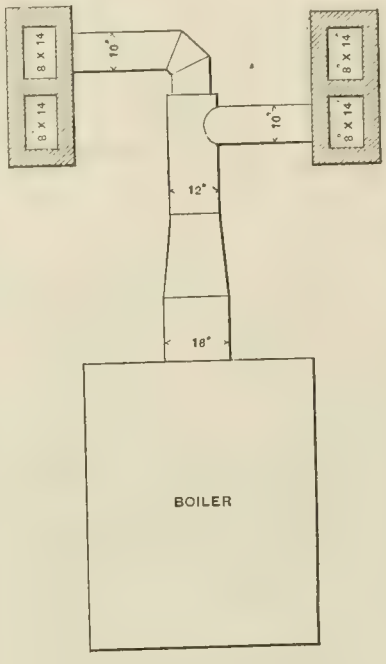
THE LETTER BOX.

Cold Air from Hall.

From L. M. W., *Delaware, Ohio.*—One of the greatest advantages of a furnace for heating a house is the continual discharge of fresh air into the rooms when it is supplied from a proper source, but a source that uses the same air continually is to be condemned. Taking air from a hall that has doors opening into it from all the rooms down to the furnace and heating it, then sending it back through the rooms to the hall, effects good circulation, and will enable the house to be more easily heated than if a continual supply of new cold air had to be heated and some air already warm was forced out of the house and its heat lost. It would be a great mistake to depend on such an air supply to the furnace and to rely on the cracks and crevices around the doors and windows to do the freshening. Under such conditions the air would soon become stale, if it did not become disagreeably foul. The question of air supply for furnaces has made many a furnaceman trouble from the fact that a box from out of doors fails to supply air as often as it supplies too much, and these failures produce so much discomfort that the comfort derived when the supply is just right is used as a standard in criticism. A better way is to set in a room by itself all of the furnace except the front, which would leave the feed door and the ash pit where any dirt or dust made in attending the fire could not get into the air supply room. This could be effected by some ingenious sheet iron and carpenter work. In order that the floor of the room over this air supply room should not be cold, a box of ample size should be attached to the window from which the air was supplied and run down to a point 12 or 15 inches above the floor. This would leave the upper part of the room largely unaffected by the cold air in the lower part. Such a room would prevent the forcing of air so rapidly through the furnace, and would also modify its temperature somewhat before it entered the furnace. Then again, when the wind was in the opposite direction from the supply window there would be little liability of air being drawn from the house through the furnace and out of doors. If desired the hall could be connected with such a room, and, by dampers in the supply pipes, air could be taken from either the hall or out of doors, as preferred, though it is hardly probable that it would ever be taken from the hall. The supply of air from a box of such construction, without the room being built, would be more satisfactory than from a box connected directly with the furnace if care was taken to prevent dust arising when feeding the fire or removing the ashes.

Two Chimneys for One Boiler.

From F. L. W., *Plankinton, S. D.*—I have connected a water tube boiler with two chimneys having 8 x 14 inch flues. As the ceiling of basement is low, the smoke pipe could not be taken from top of boiler, therefore the pipe was taken from the end and into the two chimneys, as in Fig. 1. The collar on boiler is 16 inch, and the pipe is reduced to 12 inch, from which the two 10-inch pipes are taken as shown. With this arrangement of pipes the draft is defective, as the fire smolders, and if the feed door is opened smoke comes out. I have tried the experiment of using only one smoke pipe, but the draft is not as good as with two. The chimneys are perfectly straight and at least 50 feet high. They are in a schoolhouse and there are no other buildings near. The chimneys are built double from top to bottom, one side of each being used for a ventilating flue, but there is no opening between ventilating and smoke flues. Could the ventilating flues injure the draft of smoke flues on account of being so near? I have thought of taking the smoke pipe directly up from boiler, through floor, into hall for about 10 feet and into chimney, Would this change help the draft?



Two Chimneys for One Boiler.—Fig. 1.—Original Arrangement.

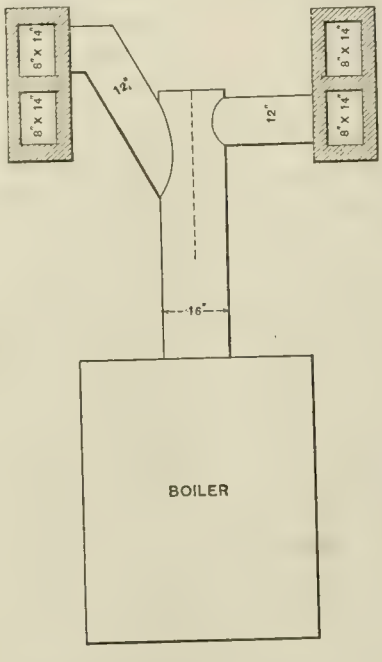


Fig. 2.—Suggested Changes.

Answer—The ventilating flues do not injure the draft of smoke flues on account of being in the same chimney, as the air from the schoolrooms would be warmer than the outer air when the boiler was in use. It is not recommended that the smoke pipe be taken through the hall, as the pipe, being of greater length, would radiate more heat and thus injure the draft by reducing the temperature. As the smoke collar connected with boiler is 16 inches in diameter, it is supposed to indicate the size of pipe required. By reducing the pipe to 12 inches, and then taking two 10-inch pipes from same, it would appear that sufficient draft is not obtained. The area of a 16-inch pipe is nearly 201 inches, and of a flue 8 x 14 is 112 inches or 224 inches for the two. This is slightly in excess of the area of the smoke collar. The area of a 10-inch pipe is nearly 78.5 inches, or 157 inches for the two. It will be seen that the area of the two 10-inch pipes is less than that of the smoke collar, or of the two chimney flues. The area of a 12-inch pipe is nearly 113 inches, or 1 inch more than that of the chimney flue. As it is supposed that a 16-inch pipe is the proper size for boiler, it is suggested that the pipes be arranged as shown in Fig. 2. The two 12-inch pipes are taken from the main pipe in a convenient manner, and connected with the chimney flues. If desired, a diaphragm, as indicated by the dotted lines, can be placed in the main pipe, thus giving to each pipe its share of draft.

Principles of Pattern Cutting.

From W. N., *New York.*—In answer to "F. D.," whose letter appeared in *The Metal Worker* of October 21, I wish to say that if he will make application to be admitted to the mechanical drawing class, teaching descriptive geometry, in Cooper Union, Eighth street and Fourth avenue, New York City, he can at least learn the principles underlying all pattern cutting in sheet metal work.

Loss of Heat From a Furnace.

From C. E., *New York.*—I have a customer who has a furnace which heats the cellar very much, although it has an inside lining of asbestos and the pipes are covered with asbestos. I would like to know how to remedy this trouble, and would be glad to have suggestions on the subject.

PLUMBING and GAS FITTING.

Franklin Trade School, Boston.

Benjamin Franklin, in his will, gave the citizens of Boston, Mass., in 1791, the sum of £1000, which he directed to be loaned in small sums at 5 per cent. interest to young married artificers of good character, under the age of 25, who had faithfully served an apprenticeship in that city. Dr. Franklin estimated that the £1000 would increase in 100 years to £131,000, and then the managers of the fund were to lay out in some public work £100,000, the balance continuing on interest for a further 100 years. The whole sum will then revert to the people of the city of Boston and the State of Massachusetts. The trustees under the will are the Selectmen (now the Board of Aldermen), united with the ministers of the oldest Episcopal, Congregational and Presbyterian churches in Boston.

The 100 years having expired, a meeting of the Franklin trustees was held on November 10, to decide on the appropriation of the available money, amounting to some $415,000. Out of 27 suggestions for its disposition, it was finally decided by vote that the whole amount should be devoted to the purposes of one object, and that object the establishment of a trade school, pure and simple. It was further agreed that the school is to be an independent one, unconnected with the public schools, and that it shall bear the name of the famous donor. The erection of the necessary building, or buildings, will probably be put in hand without delay, as soon as the site is decided on. Although the general plan of the school is not yet made public, it is understood that it will be started gradually and in separate buildings, perhaps one at a time.

The plumbing trade will, most likely, be the one in which a beginning will be made, as was done in the case of the opening of the New York Trade School years ago. Bricklaying, stone cutting, painting and carpentry will follow. The present idea of the managers is to follow, more or less closely, the Auchmuty system, which has proved so satisfactory in New York and elsewhere.

GAS PIPES that are claimed to be perfectly gas tight, says a foreign exchange, are now made of manila paper, cut in strips equaling in width the length of the pipe to be made. These are passed through a vessel filled with melted asphalt, then wrapped firmly and uniformly round an iron core until the required thickness is attained, then subjected to pressure, after which sand is strewn over the outside and the whole cooled in water. The iron core is then removed and a coating of waterproof composition put on the outside of the pipe.

A Question of Authority.

From E. S., *New York.*—Will you kindly explain for me in *The Metal Worker* how the township or county authorities who make rules for Astoria, L. I., can prevent a good plumber from doing work there? I figured on two frame houses, and no sewer or main water pipe being in the street, assumed they could not interfere with a man who was capable of doing work in the city of New York and had a New York license. I still believe that the authorities cannot go to such extremes, and have had a dispute on account of it, and to be sure have concluded to ask your opinion and decision in the matter. It may be that the new law enacted by the State covers this point and allows the Board of Health in each town such privilege. I should not think, however, that there could be a law preventing a man from doing plumbing anywhere as long as he required no permit for sewer and water connection, opening street and setting water meters, &c.

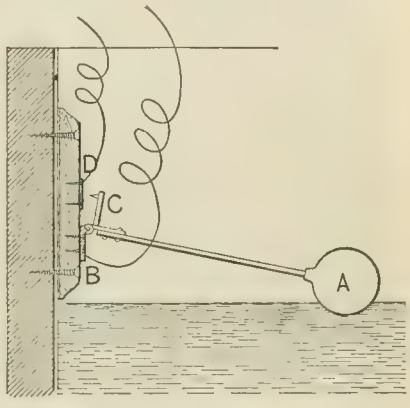
Note.—Chapter 602 of the laws of 1892 provides that any local government may form regulations to control plumbing and plumbers within its jurisdiction. These regulations, as a rule, require that any person wishing to carry on the plumbing business within the locality must pass an examination and take out a license. The law does not intimate that a license granted in one place is of any use in another place where a license is required. If such a set of regulations are in force in the city in question it seems hardly probable that our correspondent can continue to work there. Having received a notice from the authorities, it is presumed that they have not acted without power, and if he should ignore them it is probable that their powers would be exercised and the question asked would be decided in the courts. The law as it now stands requires that to do business certain requirements must be met. This opens a very interesting question, as a great many plumbers are carrying on business without a license at the present time. In the past plumbers have experienced no difficulty in working in different cities by hiring a local plumber to do that portion of the work which required a permit. The case reported by our correspondent is the first that is brought to our notice of difficulty being experienced where no permit was required.

C. W. MCDONALD has moved to Corpus Christi, Texas, where he is prepared to do plumbing in all its branches.

Electric Tank Filling Alarm.

BY OLIVER TWIST.

In many city and country buildings large tanks for storing water for domestic purposes are used in connection with the plumbing of the building. In some of our large cities the pressure in the street mains is not sufficient to reach over the fourth flat, and the fixtures on the floors above this point are supplied from a tank placed at the top of the building and filled by a pump. Although country villas are not usually very high it is necessary to have a tank when there are no water works, and a wind mill is used to pump water from a well to the tank, which furnishes the water to supply the fixtures located throughout the house.



Electric Tank Filling Alarm.—Fig. 1.—View of Float and Connections.

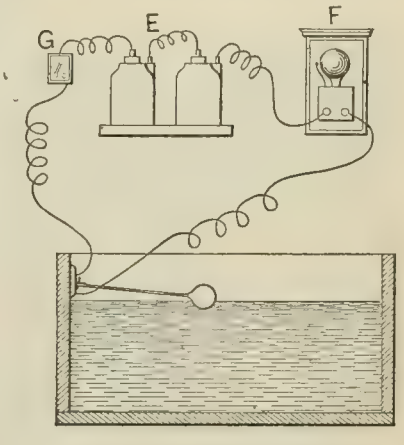


Fig. 2.—Alarm Connected with Tank.

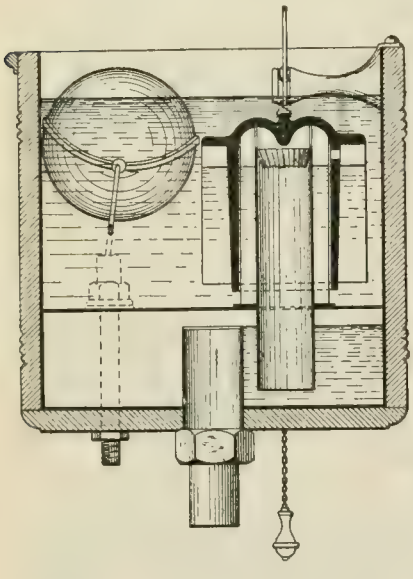
Fig. 3.—The Switch G Enlarged.

In the cities the water is pumped

from the basement to the tank by an engine of some kind, and some device for warning the engineer when the tank is full is desirable. For this purpose the device here illustrated has been set up. It is very simple and can be made by almost any mechanic in town or country. In Fig. 1 A is a float about 2 inches in diameter, which is soldered to one end of a lever, and a brass hinge, B, is secured to the other end, as shown. A piece of brass, C, is placed at right angles to the lever to make contact, when the float rises, with the brass plate D, which closes the circuit of the battery E, Fig. 2, and rings the bell F, which should be placed where it will be sure to be heard at the pump. The bell would continue to ring when the tank was full but for the switch G, which should be located near the pump so that it can be moved over so as to break the circuit until the water in the tank has fallen low enough to release the contact between the points C and D. G is a block of hardwood, Fig. 3, having a brass lever pivoted at one end and arranged, as shown, to make or break contact between the points *a* and *b*, to which the wires are attached. Before commencing to pump again all that is necessary to do is to switch on the current, then pump away till the bell rings. The battery, E, Fig. 2, consists of two cells of Leclanche style connected, as shown, the same as an ordinary bell circuit.

The I. P. W. Syphon Pull Tank With After Flush.

The Walcott-Hurlbut Company, 175 and 177 Lake street, Chicago, are introducing the I. P. W. tank, which



The I. P. W. Syphon Pull Tank with After Flush.—Sectional View.

is herewith illustrated. This tank is constructed in such a manner as not to have any valves or parts to wear out. As shown in the sectional view the lower portion below the first bottom of tank is divided into two parts, one to receive water which forms the seal of the upright pipe, and the other to receive the water which is stored for the after flush. The operation of the tank is as follows: The upright pipe being sealed as shown, water enters the tank through the ball cock. This water continues to rise in the tank until the float or ball of the cock has by its buoyancy closed the cock and stopped the flow of water. To start the water all that is necessary is to pull the handle which is attached to the lever in the tank. This raises the bell, which raises the water inside of it, and this water overflows into the pipe within the bell. Being guided by the lips in the pipe the water falls free of the sides, rarefies the air, and carries it out under the lower edge of the pipe, thus forming a partial vacuum. When more water runs over more air goes out, and this is repeated in quick succession until such a body is passing over as to form a complete vacuum, when the pipe is running full. This continues until the tank is emptied and the air rushing under the bell has broken the syphon and stopped the flow. The float having fallen with the water has opened the cock, and the water again rushes in. The I. P. W. cannot overflow its tank, for, if the ball cock should fail to act, the water would rise in the tank to a certain hight, when the syphon will act automatically and give as good a flush as if the lever had been operated. The after flush is also useful for a washout, as it furnishes water to fill the depression in closet to receive the soil, chilling it and suppressing the gases. A difficulty experienced in the use of syphons is the breaking of the stream and stopping the flow of water when it is desired to do so. By the attachment of Poore's breaking device an absolute break, it is said, is secured when a full stream of water is flowing into the tank under heavy pressure. This device is shown in the cut, it being the outer bell with an opening for communication with the inner bell.

Where Are the Aged Plumbers?

From C. J. P., *New York.*—Why do we see so few aged plumbers in our profession? In speaking of aged plumbers I refer to the journeyman plumber, the every day worker, and not to the boss or master plumber. Being one of the profession I can, to a great extent, explain the reason, having studied the causes that remove the plumber at an early age. From observations and contact with a number of men in our profession, it can be safely said that their short life is to a great extent due to the reckless disregard which they have for their health. From a few of the facts that have a bearing on the above explanation its correctness can easily be seen. There are a number of elements of a poisonous character with which the plumber has to come in contact that are taken into the system of the thoughtless mechanic as if they were pure and good for him. The well-known sewer gas or air, with the many diseases that mingle with it, that come from all points, the deadly illuminating or coal gas, and the quieting charcoal gas. One of the chief and most dangerous agents is the new lead pipe and sheet lead that he is constantly handling and forcing particles of the metal through his skin and into his blood, along with what he breathes into his lungs. Red lead, white lead and all other filth, of which he has a constant stock under his finger nails, that is bound to be taken up by the blood to help the rest of the poison that is taken up at other points. He breathes the foulest kind of air in filth soaked cellars, under basins and sinks, where dirty housekeepers' rubbish, and frequently garbage, are put. Rats and mice also play their part in impregnating the air. All this and what it implies are some of the reasons why we have so few old journeymen plumbers. All this to a great extent can be remedied and bring longer life to the plumber. Bring about you all the fresh and pure air possible. Keep the deadly hot air of the charcoal and gasoline furnace away from you. Handle lead pipe with gloves, keep your finger nails clean, keep all sewer openings closed as much as possible. Never eat with dirty hands. Keep clean overalls, or you will be carrying poison about with you all the time. Keep your working surroundings clean. Eat your meals regularly, masticate your food well, go to bed in time, and last, but not least, avoid liquor. This when mixed with the other poisons leaves the plumber no show whatever for longevity.

TRAPS AND VENTS.

D. G. FINNERTY, president of the National Association of Master Plumbers, recently attended a meeting of the local association at the Master Builders' Exchange, at Philadelphia, Pa.

HENRY TEXTOR, 2 Throop avenue, Brooklyn, N. Y., reports an increasing demand for the Textor cellar drainer, sewer gas and back water trap. The trap provides for draining the cellar, and it is arranged to be easily cleaned. A deep water seal is provided against sewer gas, and a copper plate is arranged with a guiding stem to rise against a brass seat and prevent water backing into the cellar from a flood in the sewer.

HEALTH COMMISSIONER MCLEOD of Detroit made a statement at the recent meeting of the Board of Health which showed that the city had maintained its Health Department for the last year at less expense than that of any other city of the same size in the country, and strong claims were made for its efficiency.

THE PLUMBING FIRM of Bird & Marshel, at Greenville, Ohio, has been dissolved, and the business is now conducted by W. P. Marshel & Son.

P. H. HORGAN is having a two-story frame building erected on Mill street, Newport, R. I., to be occupied as a plumbing establishment.

AFTER PROPER EXAMINATION by the board appointed for that purpose, certificates have been ordered issued to the following named plumbers, at Los Angeles, Cal.: Masters—E. G. Ord and Arthur Sharples; journeymen—E. E. Knight and J. Murlock.

THE FOLLOWING from a foreign exchange is a suggestion worthy of consideration: This is a very good time for plumbers to remind their customers and others of the importance of having all range boilers, and both hot and cold water pipes, put into safe and efficient condition before winter comes on. A carefully drawn circular would doubtless be the best medium for persuading even the least prudent that an inspection is advisable; for if all is well, that need cost him little; if aught is wrong, it is better to know it in time. The sense of security is worth something to everybody. Range boilers (water backs) degenerate, pipes corrode, exposed supply pipes freeze. If the danger of accidents, of loss by possible damage, and the inconveniences resulting from defects were stated forcibly but plainly in a businesslike way, followed up by a suggestion that a careful survey should be made with a view to commencing the winter with the water system of the house in shipshape order, most householders would regard the suggestion as at least a happy thought and look upon the suggestor as a wide awake tradesman whom it would be desirable to bear in mind when any work was needed, even if they did not promptly seek his services.

IT APPEARS that the Colwell Lead Company were not the only losers by the sinking of the "Dean Richmond,"

which occurred recently in Lake Erie. The Rochester Lead Works, Rochester, N. Y., were also losers to the amount of 80,000 pounds of pig lead, making a total loss of this metal of 176,000 pounds.

BEAGLE BROTHERS, formerly with M. L. Snow, stove and hardware dealer, of Saratoga Springs, N.Y., have taken a store at 53 Court street, where they will establish a plumbing, stove repairing, &c., business. They are enterprising men in this line.

GEORGE G. RADDIN is one of the recently licensed plumbers of Lynn, Mass.

JOSEPH C. DUFF, a plumber, of Jersey City, N. J., is now engaged in renovating the heating apparatus of the different institutions belonging to St. Paul's Catholic Church of that city.

THE SHUSTER FOUNDRY of Franklin and William streets, Philadelphia, and South Pittsburg, Tenn., are shipping two carloads of their plumbers' soil pipe and fittings to British Columbia. This speaks well for the reputation of their goods.

THE THOMAS H. RADCLIFFE PLUMBING COMPANY of Brooklyn, N. Y., were incorporated on November 9, with a capital of $5000. The directors are Thomas H. Radcliffe, Michael J. Lawless and Alice Radcliffe of Brooklyn.

THE CONTINUANCE of the office of plumbing inspector at Indianapolis, Ind., is still being urged by a goodly representation of both the journeymen and master plumbers of that city. A letter from J. Arnold, a member of the plumbers union, recently appeared in one of the daily papers explaining the necessity of an inspector.

BUILDING AND PLUMBING INSPECTOR Charles Lane of Butte, Mont., reports some activity among the plumbers of that city owing to the extension of the sewer system.

THE MASTER PLUMBERS of St. Louis, Mo., the home of ex-President Sheehan, are making preparations for the entertainment of Daniel J. Finnerty, president of the National Association of Master Plumbers, who will visit that city in the near future, accompanied by several other national officers. It is proposed to tender them a ball and banquet.

MASTER PLUMBERS' ASSOCIATION of Baltimore recently had a banquet in honor of D. J. Finnerty, president of the National Association of Master Plumbers. D. J. Barry, president of the local association, made an address of welcome. Other addresses were made by John Trainor, William H. Rothrock, James McCart, Daniel A. Sullivan and Edward J. Healey, Jr. Among the other guests present were George Knipps, James P. Carey, Thomas B. Boland, Henry Bowman, Thomas B. Hibberts, Patrick Sullivan, Thomas Ward, Charles Fredericks, W. W. Bowles and P. Sherry.

A RECENT VISITOR at Trenton, N. J., noticed some activity among the sanitary earthenware manufacturers.

AT THE QUARTERLY CONVENTION of the New England Plumbers' Union, recently held in Boston, there was a good attendance present. The officers elected were T. J. Collins, president; A. J. Bradley, vice-president, and W. T. Brown, secretary and treasurer. Resolutions were adopted on the death of Patrick Regan, which were ordered to be engrossed and presented to the widow of the deceased member. New by-laws were adopted and reports from different cities gave the business of the craft as fair. The next meeting will be held in Providence, R. I., January 14.

PITTSBURGH BRASS COMPANY, Pittsburgh, Pa., and 36 Park place, New York, issue an illustrated catalogue and price-list of plumbers' supplies and specialties for the season of 1893-94, including lavatory supports, fittings, brackets, tank and seat brackets, traps, closet and urinal slab supports, pipe holders, soap cups, towel racks and shelves, &c. At the back of the pamphlet will be found illustrations of various kinds of metal work for banks, offices, stairways, water closets, bathrooms, &c., as well as a number of styles of low ash pan screens, brass fronts for gas fires and ornamental kettles for water to be used in rooms as air moisteners.

News and Notes.

The Howell torpedo tests at the Newport trial station have been brought to a close. About 80 tests, of the most severe character, have been made in all, and, so far as is known, to the complete satisfaction of the naval ordnance officers. Considerably more than the contract speed was obtained.

In some districts in England coal is retailing at $15 a ton, in consequence of the miners' strike. Cold weather having set in early, the condition of the poor, who cannot afford to pay so high a price, is considered serious.

October's fire loss of the United States is estimated at $11,014,700, which is over $2,000,000 less than the amount lost in Octobar, 1892. The increase in the total for the first ten months of this year, as compared with the same months of last year, amounts, however, to nearly $25,000,000, a sufficiently startling presentment. The actual figures are: January 1 to October 31, 1893, $132,847,400; same period, 1892, $108,341,550.

Eckley B. Coxe of Drifton has been nominated for a second term of the presidency of the American Society of Mechanical Engineers.

A decree has been publis hed by the Italian Government that all customs duties in that country shall hereafter be paid in gold.

The ponderous after barbette of the United States battle ship "Indiana," building at Cramp's yard, was put in place last week. It is composed of the heaviest nickel steel armor ever fitted, and has been in course of construction at Bethlehem for nearly two years, the work of putting it in place occupying two months. The barbette is made in 13 plates, which were forged under the 125 ton hammer. It is 30 feet in diameter, 13 feet high and 17 inches thick, the total weight being 406 tons. The "Indiana" will, it is calculated, be ready for her builders' trial trip by February 1, and the vessel will be delivered to the Government about June 1.

The Edison patent on incandescent lamps expired in England on November 10, and from that date their manufacture and sale in that country will be free, with the probability of a considerable reduction in prices.

Depression in the shipping trade is reflected in the returns of Suez Canal receipts for the first nine months of this year. They were $754,000 less than those for the corresponding period of last year. Hitherto each year has shown an advance on the previous one.

At Indianapolis every effort is being made by the Commercial Club, the Board of Trade and the city officials, in combination, to organize relief for the more than 6000 idle workingmen in that city. Citizens have been appealed to to make every improvement of any sort that will give employment, and renters are asked to be lenient.

The work of fitting out a new navy for the Brazilian Government is being urgently pushed at New York, where a number of recently purchased craft are undergoing rapid transformation into war vessels. Most of the ships are expected to be ready for service by the end of this week.

October's foreign trade returns for the port of New York show a decrease of $16,500,000 from the aggregate of October, 1892; but this falling off is due entirely to the large contraction in imports of foreign goods. Exports, indeed, show a slight increase for the month; and for the ten months of the year the aggregate movement of foreign trade shows $57,150,522 over the corresponding period of last year.

The new steamer "Gloucester," built at Baltimore for the Merchants & Miners' Transportation Company and which made her first trip to Boston a few days ago, is probably one of the finest coasting vessels afloat. The hull is built of steel throughout, and she has four decks as well as a promenade deck. Her length over all is 293 feet; beam, 43 feet; depth, 33½ feet, and tonnage, 2500. Power is furnished by direct tricompound engines with inverted cylinders, and the four cylindrical and return tubular boilers are capable of developing 3000 horse-power. The arrangement of her water tight compartments renders the vessel practically unsinkable.

The new Pacific built cruiser, "Olympia," underwent a most successful trial off San Francisco last week, proving herself remarkably speedy and an excellent sea boat. Her record showed a maximum speed of 21.26 knots; and her average for 68 hours, with a heavy sea and strong head wind, was just under 21 knots. The builders of the "Olympia" believe she will manage 22 knots on her official trial, and thus carry the palm of the American cruiser fleet.

The Manchester Ship Canal was completed last week and water was admitted to its entire length. It will take two weeks for the canal to receive its full depth of water. The first steamer to traverse the full length of the canal will, it is expected, make the trip on December 1.

It is estimated that damage to the extent of at least $4,000,000 has been caused to the crops in the Northwest during the present year by a weed known as the Russian thistle. The Department of Agriculture is now investigating the pest.

Buffalo, N. Y., now enjoys the distinction of possessing the largest grain elevator in the world in the new Eastern Elevator, which was completed and opened for service on Monday. Its capacity is 45,000 bushels an hour.

Washington advices have it that the Secretary of the Navy will recommend a considerable appropriation for the construction of battle ships.

Prices of California cereals have of late been the lowest ever known on the Pacific Coast, and over two-thirds of the surplus wheat for export is still being held in the State, on the chance of a rise.

ROOFING AND CORNICE.

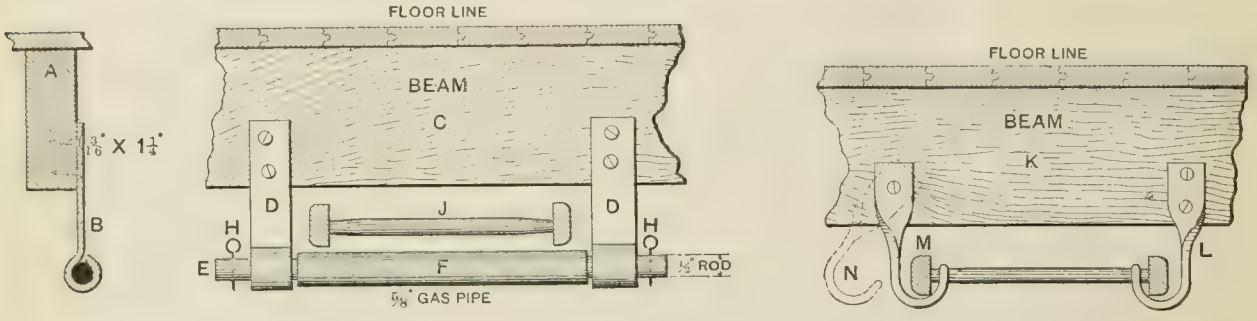
Class for Sheet Metal Pattern Cutting.

We are glad to hear that the announcement made in *The Metal Worker* of October 28, regarding a proposed class for sheet metal work, in connection with the trade school of the Pratt Institute, Brooklyn, has evoked some interest in the roofing and cornice trade in that city and in New York. Mr. Richards has received several applications from would-be students, but several more candidates will be necessary before he would feel justified in embarking in this new department of instruction. So far as we know, there is no class of the kind in existence—in this part of the country, at least—and as the need of thorough education in sheet metal pattern cutting is constantly becoming more evident, it is to be hoped that the present opportunity of securing so valuable a class will not be lost, but that a sufficient number of applicants will come forward to reap the advantage which the director of the Pratt Institute trade school is ready to present on the above condition.

The British Trade Journal for November states that the position of the English galvanized iron trade is exciting much notice. Orders for export have greatly increased of late, and manufacturers are said to be filling up their books for South America, South Africa, Australia, New Zealand and Canada. An attempt is to be made to advance prices.

Economizing Shop Space.

From W. N., *New York.*—I present herewith, for the consideration of your readers, my method of storing ladders and scaffolds in length from 20 to 28 feet. As the space in the shop was limited, a novel idea came to mind, namely, to make the necessary hooks, bands and rollers, and store the ladders or scaffolds underneath the floor beams, or, in other words, hang them beneath the ceiling. The illustrations herewith presented will show how this was accomplished. In Fig. 1 is shown the front and sectional views of a ladder hanger, the ladder being placed at right angles to the beams. A, in the sectional view in Fig. 1, indicates the wooden beam; B, the sectional view of the $\frac{3}{16}$ x $1\frac{1}{4}$ inch band iron bracket, which is screwed against the beam A as shown;



Economizing Shop Space.—Fig. 1.—Front and Sectional Views of a Ladder Hanger, Hung Crosswise to the Beams.

By boring or drilling two $\frac{1}{8}$-inch holes at each end of the rod E, two pins, H and H, are placed in it to prevent the rod from slipping out of the brackets when putting up the ladders. Before placing the rod E through the brackets a $\frac{5}{8}$-inch gas pipe (inside measure) is slipped over it, as shown at F, and forms a roller, which lightens the work of sliding the ladders in place. L, Fig. 1, indicates a stationary hook made of $\frac{3}{16}$ x $1\frac{1}{4}$ inch band iron, twisted half way around, as shown, and screwed fast to the wooden beam. M is a twisted hook fastened to the beam with one long wood screw, which acts as a pivot, and allows the hook to be swung outward when desired. To hang a long ladder, say 25 feet in length, the brackets D and D and hooks M and L would be placed about 20 feet apart. To slide the ladder between the ceiling with hardly any trouble whatever proceed as follows: Raise one end of the ladder up from the floor until it rests upon the pipe F, Fig. 1, then raise the other end of the ladder, being careful always to press toward the pipe F, as the tendency is to slide out; now, holding it up at arms' length, obtain a spruce slat $1\frac{1}{4}$ x 3 inches in thickness and long enough to reach the ceiling, have a groove cut in one end of the slat, as shown in Fig. 3, and placing the groove under one of the rungs of the ladder, raise it slowly, always pressing toward the pipe F, until it sets in the stationary hook shown at L in Fig. 1; now press the hook N forward by means of a strip of wood to the position M, which secures the ladder.

When taking down the ladder or scaffold the same operations should be

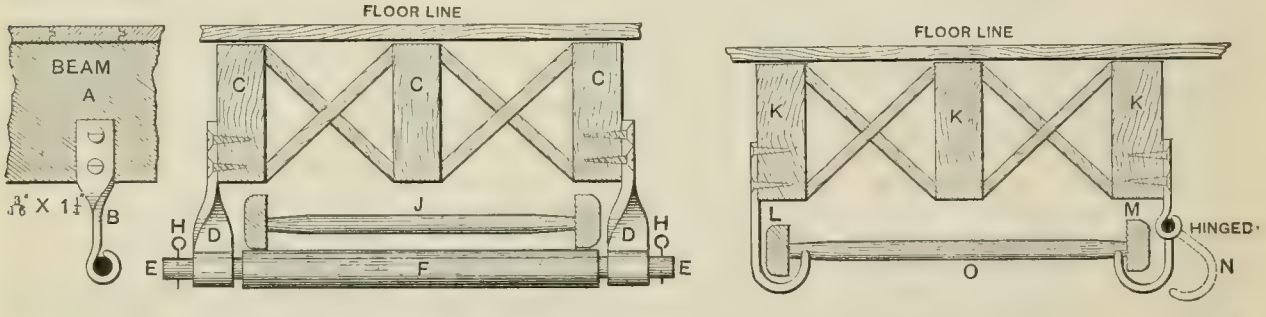


Fig. 2.—Front and Sectional Views of a Ladder Hanger, Hung Parallel to the Beams.

Fig. 3.—Spruce Lifter.

D and D show the front elevation of the brackets, screwed to the beam C. The width of the ladder J being known. the brackets D and D are spaced accordingly, so as to allow the ladder or scaffold play room to slide in or out, as shown. E represents a $\frac{1}{2}$-inch iron rod placed through the brackets D and D as shown.

performed reversed. Fig. 2 shows the front and sectional views of a ladder hanger, the ladder being hung parallel with the beams; whereas in Fig. 1 the ladder is hung at right angles with the beams. The only change required in this case is that the brackets shown at D and D in Fig. 2 require twisting, as shown, and the hook shown at M in Fig. 2 must be hinged so as to allow it to work back and forth.

A Fallen Ceiling.

Below we give a letter from a correspondent which contains some useful information:

The following experience in replacing a fallen ceiling may be of interest to some of your readers: The hallway in an ordinary city dwelling one morning was found to be littered with a lot of plaster that had fallen from the ceiling above. Appreciating the wealth of dirt that would accumulate in putting up a new plaster ceiling, a search was made for some more suitable material. In visiting the houses who make a specialty of interior wood decoration it was found that an ordinary strip ceiling with a hardwood finish, put up complete, would cost from 50 cents to 60 cents a square foot, and if something more ornamental and elaborate was desired, of a panel character, the cost would approach $1.75 per square foot. The next search was for something of the Lincrusta Walton or *papier maché* order, and here it was learned that it would be necessary to replaster the ceiling previous to the use of any such material, and after the ceiling was plastered, the cost of material, the labor of putting up and the cost of decorating would make such a ceiling cost from 35 cents to 50 cents a square foot.

The search was continued for something in sheet metal, which was found to be adaptable without any labor being spent on the old ceiling. What were called furring strips would be required to be nailed to the joists and wood work, and the sheet metal panels would be fastened to these furring strips, saving all the labor and dirt in tearing down the old ceiling, and the claim was made that after it was in place all joints would be covered, so that the ceiling would be of the same finish as if it had been of molded plaster and frescoed. The designs seemed to be almost unlimited in variety; borders and friezes with coves and cornices provided everything that could be desired for such a purpose. With all this variety to select from it was found that a ceiling put up, decorated and finished complete, would cost from 15 cents to 25 cents per square foot, according to the character of the design and distance of the building from the dealer's shop. An argument in favor of the metal ceiling was that the Lincrusta Walton would be permanently destroyed if a fire occurred in the room above and the water soaked through, and the same was true of wood. It was also stated that cracks and warping from the ordinary heat of the house were sure to follow the use of a wood ceiling. A fire in the room above with a metal ceiling might destroy its finish from water, but repainting would leave it in as good condition as in the first place, while a considerable fire might occur on the floor below without passing beyond the metal ceiling.

The Niagara Stamping & Tool Company, Buffalo, N. Y., have received an award of excellence from the World's Fair for their tinners' machines and tools, squaring shears, presses, &c.

FLASHINGS.

Cooney, Seiner & Co. have succeeded Myer & Cooney, 19-20 East South street, Indianapolis, Ind., manufacturers of the Centennial water cut off for cisterns.

Among those who received blue ribbons at the Columbian Exposition were the Sykes Steel Roofing Company of Chicago, Ill., and Niles, Ohio. A duplication of the official ribbon which we have received announces that it is a premium awarded on Sykes patent cap steel roofing.

Building operations are reported by the Canadian *Journal of Commerce* to be quite brisk in the city of Montreal. The Montreal Roofing Company have a large number of men at work, of whom 90 per cent. are engaged in the roofing of new buildings.

Columbia Roofing Company, Canton, Ohio, are distributing an illustrated circular giving directions for applying the Columbia standing seam roofing, corrugated and V-crimped roofing and siding, beaded siding and ceiling. Practical information of this sort is always appreciated by the trade.

N. A. Haldeman & Co. of 59 North Second street, Philadelphia, manufacturers of steel and iron roofing, corrugated iron sheets, roofing paints and cements, have opened a branch office in New York. This was rendered necessary by the growth of their business. With their office in Baltimore and main office in Philadelphia they now hope to be able to look after all branches of their trade to the increased satisfaction of their patrons. Their business includes a large and growing export trade. During the early part of the present month they shipped a large quantity of painted corrugated sheets to Gutierrez, Mexico, and a number of galvanized sheets to Santa Clara, Cienfuegos, Cuba. Among the home orders recently executed was one for curved sheets for the ceilings of the new court house at Mauch Chunk, Pa., which order covered over 1700 sheets, the whole weighing upward of 22,000 pounds. One of their specialties is the N. A. Haldeman patent steel roofing, which is self capping and is quickly and easily laid by an ordinary mechanic. The method employed in laying this roofing, it is claimed, insures an absolutely wind and storm proof roof. Another specialty is their roofing paint, which was introduced by the firm about 17 years ago and has met with large demand. The corrugating of iron and steel is a leading feature of their business, and taxes the resources of their plant for this work. For the accommodation of the trade Messrs. Haldeman undertake the work of corrugating for those wishing to furnish their own material.

In a few weeks the Cambridge Corrugating Company, Cambridge, Ohio, will place on the market Stanley's patent felt lined iron and steel roofing. Sheets treated in this manner are said to be impervious to the action of moisture arising from the insides of buildings, and this company claim to be able to manufacture the material at a slight increase over the cost of plain roofing.

The Canton Steel Roofing Co., Canton, Ohio, have reproduced their factory, which was destroyed by fire, and have added many new facilities. The building is lined inside and outside with sheet iron, following the surface, care being taken not to leave any places which would act as fire flues or air conductors. It is said to be the first building of its kind ever constructed. Every part of the wood work is covered completely. The plant will be equipped with new and improved machinery, calculated to produce maximum quality at minimum cost.

HEATING NOTES.

The Watson & McDaniel Company have filed articles of incorporation in Hudson County. With a capital of $100,000 the company propose manufacturing steam and hot water appliances of brass and iron. The corporators are: Thomas H. Williams, George W. Conklin, Charles F. Imrie and Samuel R. Harlow of New York.

The Herendeen Mfg. Company, Geneva, N. Y., have opened an office in New York at 206 Centre street under the charge of James G. Dudley. Among the sales already made through their New York office may be mentioned two No. 9 steam Furman boilers to the New York Steam Fitting Company for the building 126, 128 and 130 White street, New York. This is a nine-story structure, and the specifications called for 4500 square feet of heating surface.

The Robinson Heating & Ventilating Company of Altoona, Pa., report a satisfactory trade in steam and hot water heating the past fall. They use principally the boilers made by the American Boiler Company, and the radiators of the American Radiator Company.

The Improved Palace King hot water heater is brought to the notice of the trade in the catalogue just issued by Russell Wheeler & Son, Utica, N.Y. The circular contains but a moderate number of pages, and has a certain elegance of appearance due to the small amount of letterpress, excellence of typography, colored ink, and finally the printing, which is on but one side of the pages. The particular feature to which the attention of the trade is called is the method of joining the boiler sections by nipple connections, which are pocketed in the water posts. General and sectional views and separate illustrations of the sections are presented, together with sufficient description to make clear the chief features of the heater.

The Y. M. C. A. of Cleveland, Ohio, recently gave a reception to the Stationary Engineers and Metal Workers of that city with the idea of acquainting them with the privileges of the association. Several hundred attended and were entertained by short talks, music and an exhibition in the gynasium.

Oldham, England, is said to have a furnace for destroying the town refuse, which burns at such a high rate of temperature that its heat, applied to raising steam, furnishes sufficient power to more than cover the cost of collecting and burning the garbage.

A good paint for iron work exposed to the weather can, it is said, be made by mixing ½ gallon of linseed oil to an equal quantity of good outside varnish, and adding sufficient red lead to make it of the consistency of paint.

THE TIN SHOP.

Pattern for Elliptical Cover.

From G. W., *Coal Creek, Col.*—Will *The Metal Worker* publish a method for describing the pattern of a pitched cover for an oval dinner pail ?

Answer.—In Fig. 1 is presented the end and side elevations, also plan, of a pitched cover. The shape in plan is indicated by B*a* D*a* C*a* E*a*, in side elevation by B*b* Y*b* C*b*, and in end elevation by E*c* Y*c* D*c*. The shape shown in plan is struck from two sets of centers, which is a convenient method to use when an approximate ellipse is required.

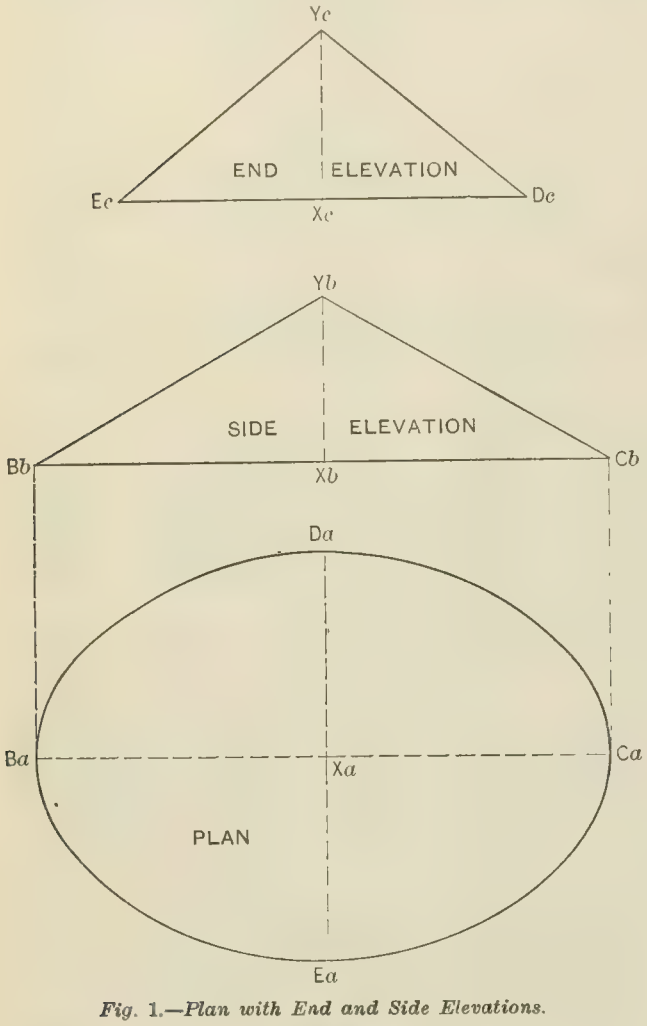


Fig. 1.—Plan with End and Side Elevations.

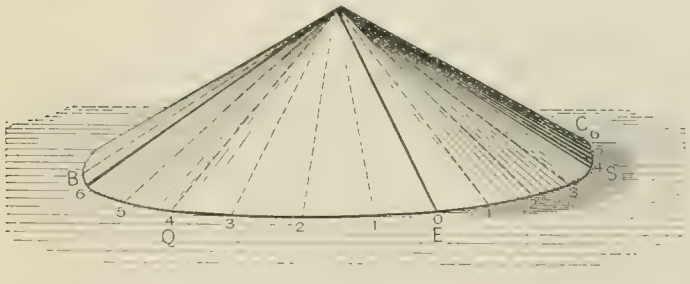


Fig. 4.—The Finished Article.

The ellipse shown in Fig. 2 is a duplicate of the one in Fig. 1, and is described as follows:

Let B C represent the length of the required figure and D E its width. B C and D E are drawn at right angles to each other, intersecting at their middle points at X. The next step in describing the figure is to obtain the difference in length between the axes X D and X B (conjugate and transverse axes), which can be done as indicated by the arc D G. This difference, G B, is to be set off from the center X on X B and X D, as shown by X H, X J; then draw H J and set off half of H J to L, as indicated by the arc K L. The object of the operation so far has been to secure the point L, which is to be set off from X on X D, X C and X E, as shown by the points L, M, N, O, which give the centers from which the ellipse is be struck.

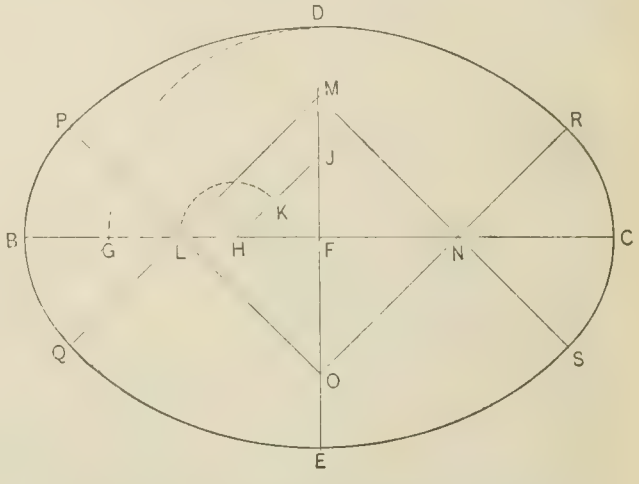


Fig. 2.—Method of Describing the Figure from Centers.

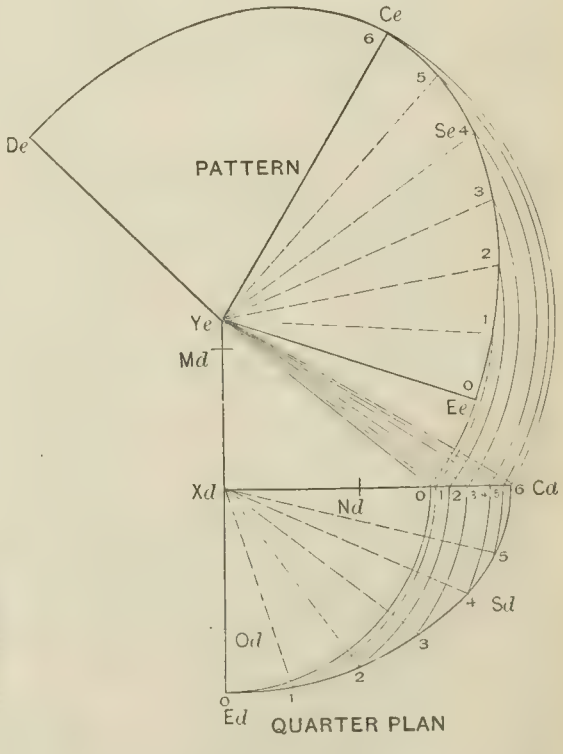


Fig. 3.—Method of Obtaining the Pattern from the Quarter Plan.

PATTERN FOR ELLIPTICAL COVER.

For convenience in describing the figure, from M draw M L Q and M N S indefinitely, and in a similar manner O L P and O N R. With O as center and O D as radius strike the arc P D R, cut-

ting O P and O R as shown. In a similar manner and with the same radius, or, which is the same, with M E as radius and M as center, describe the arc Q E S. With L and N as center and with L B or N C as radius strike the arcs Q B P and R C S, thus completing the figure. If the lines are not drawn from O and M the point of contact between the arcs is difficult to determine.

Having thus obtained the shape of article in plan, any desired hight can be given to it, as indicated by X*b* Y*b*, X*c* Y*c* of the elevations in Fig. 1. An examination of the plan will show that it is composed of four similar parts, as X*a* E*a* B*a*, X*a* B*a* D*a*, X*a* D*a* C*a* and X*a* C*a* E*a*. It must be evident that a pattern for one of these parts, as X*a* C*a* E*a*, can be used for marking off the others. As the article is for a pail cover it might be convenient to have the pattern in two pieces, the seam being as represented by E*a* D*a*, the apex of the elliptical cone being at X*a*.

For the purpose of illustration it is convenient to show the two elevations and the plan, as has been done in Fig. 1, but for obtaining the pattern of one of the four parts, the hight of the article being known, it is only necessary to draw the quarter plan, as has been done in Fig. 3. For the purpose of avoiding a confusion of lines, in this figure the method of describing it has not been shown. The method is the same as previously explained. The arc E*d* S*d* was struck from M*d* as center, and the arc S*d* C*d* from N*d* as center.

Then to describe the pattern shown in Fig. 3 proceed as follows: On E*d* X*d* extended lay off the hight of the article, as indicated by X*d* Y*e*. Divide E*d* S*d* C*d* into any convenient number of equal parts, as indicated by the small figures. As E*d* S*d* was struck from M*d* as center, and S*d* C*d* was struck from N*d* as center, it may be well to divide these parts into equal parts, as has been done. Lines can be drawn from the points in E*d* C*d* to X*d*, if desired. These lines, if drawn, give the base lines of triangles, the altitudes of which are to be equal to the hight of the article. A convenient method for drawing these triangles is as follows: With X*d* as center strike arcs from the points in E*d* C*d*, cutting X*d* C*d*, as shown. Lines drawn from the points thus obtained to Y*e* will give the hypotenuses of the triangles, which, if set with their bases on the proper lines in plan, would give the distance from points in E*d* C*d* to the apex of cone as if measured on the finished article. These triangles are shown in X*d* Y*e* C*d*.

With Y*e* as center and the points in X*d* C*d* as radii strike arcs indefinitely. Draw any line, as Y*e* E*e*, which will form the edge of pattern corresponding to X*d* E*d* of plan. With the dividers set to the distances used in stepping off E*d* C*d* of plan, and starting from E*e*, pace off the stretchout of E*d* C*d*, stepping from arc to arc, as shown. From the point 6, or C*e*, draw a line to Y*e*. Through the points thus obtained trace a line freehand, or by bending a strip of metal the desired shape and drawing the desired line, as shown. Then Y*e* C*e* E*e* is the pattern for part of article shown on plan, Fig. 1, by E*a* X*a* C*a*, or in Fig. 3 by E*d* X*d* C*d*. The other part of pattern, as Y*e* D*e* C*e*, can be obtained in a similar manner or by duplication. As the net pattern only is shown, suitable edges are to be allowed for joining. The finished article is shown in Fig. 4.

HEATING AND PLUMBING.

NEW WORK AND CONTRACTS.

The Pawtucket Steam & Gas Pipe Company of Pawtucket, R. I., report that they have used the Exeter radiator made by the Exeter Machine Works of Boston, Mass., in a number of heating contracts this year. Some of the residences and buildings in which they are used are those of George H. Dean, Robert Wood, David Salisbury, Terrence O'Reilley of Providence; Mrs. Olive M. Ashton, James Linton, T. T. Berry, George R. Newman, John F. Jodat, John F. Street of Pawtucket; Lonsdale Company, Lonsdale, R. I.; Circle Jacques Cartier Club, De Never Building, and John McGrath, Central Falls, R. I.; Richard W. Whittle, Saylesville, R. I.; Frank C. Viall, Auburn, R. I., and J. A. Snell, Barrington, R. I. The company mention that these radiators have given perfect satisfaction with regard to workmanship and appearance, their customers having nothing but words of praise for the same.

Maurer Brothers of Reading, Pa., have been awarded a contract for steam heating plant in the office of J. Howard Jacobs.

D. S. Ingersoll, Beverly, Mass., is installing a steam heating plant in the Universalist Church.

B. F. Shaw of Wilmington, Del., has been awarded the contract for the steam piping and plumbing in the new power house of the Atlantic Improvement Company of Long Island City, N. Y.

Bids for heating and ventilating the new morgue at Philadelphia are all in, but as yet Director Beitler has not awarded the contract.

The Swamscot Machine Company of South Newmarket, N. H., will instal the steam heating plant in the new court house at Exeter, N. H.

Getchell & Taylor of Exeter, N. H., have been awarded the contract for the plumbing work in the court house of that city.

Apgar Brothers, steam and hot water fitters, at Seventh avenue and 125th street, are using a Novelty Circulator to heat a hotel and *café* at 126th street and Third avenue.

Wm Comly, King of Prussia, recently conferred a favor on J. F. Boyer, Norristown, Pa., by awarding him the contract for a steam heating plant for his Montgomery County residence. Mr. Boyer does not, however, enjoy the distinguished honor of being court steam fitter, as the King of Prussia in this case is a Pennsylvania village of 150 inhabitants.

The Illinois Heating Company, 88 Lake street, Chicago, are to furnish the steam heating plant for the residence of C. J. Owen, Sheridan drive.

The Kewanee Boiler Company, 96 Lake street, Chicago, are to supply one Haxtun boiler for the Library Building at Elgin, Ill., and two for the Blackburn University, Carlinville, Ill.

The Blackmore Heating Company, 88 John street, New York, recently closed a contract for heating ten apartment houses at 133d street with Sunray hot water heaters, and will use the Bundy Columbian radiators.

R & J. Robertson of Beverly, Mass., has had 12 plumbers and hot water men busy attending to jobs which they are installing.

James B. Alger has the contract for installing a steam heating plant in the Parker Block, at Great Barrington, Mass. The boiler will be from the McCormick manufactory, at Wallingford, Conn.

The Gainey Mfg. Company of Hamilton are to install a new steam heating system in All Saints' Church, at Detroit, Mich.

E. Baggot, 169 and 171 Adams street, Chicago, has taken contracts for plumbing, sewerage and gas fitting in the residences of J. Monahan, Buena Park, Ill., and Theodore Kochs, Lake Geneva, Wis.

The first specimen of tin plate ever made in the Shenango or Mahoning Valley was turned out at the New Castle Steel & Tin Plate Company's works, New Castle, Pa., on November 7. The company have been making black sheets of a high quality for some time at their new rolling mills, but the tinning department was not completed until last week. The samples of tin plates turned out are reported to have been very good, and the management are highly pleased with the results. The work will now go on without intermission and a large output of tin plates is looked for.

"I have 70,000 cubic feet of air an hour in this small office," said a professor of chemistry, at the Massachusetts Institute of Technology, to a recent visitor. "I might be called one of the best ventilated men in the country. We all fare well in this respect throughout the building. The ventilation and heating are simultaneous. The cold air outside is forced by revolving fans over hot steam coils in the cellar, and rises in our walls, which are hollow, entering each room through registers near the ceiling, and escaping through openings on the opposite side near the floor. This means that fresh hot air is constantly invigorating and warming us. Believe me, good ventilation makes a ready worker."

The value of the evening educational facilities offered by the various branches of the Young Men's Christian Association throughout the country is evidently appreciated by the class for whose benefit the evening classes—such as those conducted at the Young Men's Institute in the Bowery, New York—have been instituted. G. B. Hodge, educational secretary of the International Committee of the Y. M. C. A., said recently: "There are 20,500 young men in 316 places receiving evening instruction from 700 teachers in these 'gas light colleges' of the association."

Sheet Mill Progress.—II.

BY A. BEARD, CAMBRIDGE, OHIO.

Modern Housings.

Parallel with the increase in weight of sheet mill machinery designs have been improved. The strength has been distributed to parts where it is required, and an effort more pleasing to the eye obtained. Illustrations are given in this article of various makes of housings. These will serve to show the ideas of different makers.

The high shoulders have disappeared and there is more symmetry about the modern housings. Wrought iron screws, which were continually being "jammed" and a source of great trouble and annoyance, have given place to steel screws, and the diameter has been increased from 6 to 8 inches. Dovetailed bed plates, in which housings were fastened by means of wooden blocks and iron wedges, have disappeared and V-shaped bed plates have taken their place. Upon this bed plate housings can be easily moved and made secure in a few minutes; previously it took hours to do this work. Every improvement that can be suggested has been made to prevent breakage and keep things moving.

Herein lies profit for progressive mill owners. Keeping in continuous operation reduces standing charges, such as salaries, taxes, &c., to a small cost per ton of finished product, and success follows.

It is an unexplained truth that while all these changes have been going on in design and construction of machinery, sheet mill men have made but little progress in improving methods of working. Outside influences have done more in this direction than has been done in sheet mills. Steel bars rolled on universal and other specially constructed mills, cleaned from scale in rolling, have to a large extent taken the place of bars made from muck bar piles. Quality has been improved without additional cost, and so many steel sheets of superior finish have found their way into market at the same price as iron sheets that consumers have grown critical, and it is a difficult matter to dispose of large quantities of iron sheets unless corrugators and roofing men are ready to buy.

Reworking Scrap.

Following cheap steel sheet bars several mills have been built without bar mills attached to them, no provision being made for reworking the scrap or trimmings from sides and ends of sheet packs. This has been found to be a source of trouble, as sheet scrap cannot be sold at a figure that will pay for the trouble and expense of handling and transporting it to other mills to be reworked. It is too light and bulky. Sheet mill managers have always found it necessary to devise means of using their scrap in an economical manner. A common method is to bushel the scrap in an ordinary puddling furnace, pass through the squeezer and roll into a bar, which is cut to length and made into a pile, reheated and rolled into sheet bars. To save the expense of one heat, it is now a custom in many mills to fagot scrap.

The method employed is as follows: A bench is constructed upon which a wrought iron box is placed, the ends being open and a door on the front side In the bottom of this box a muck

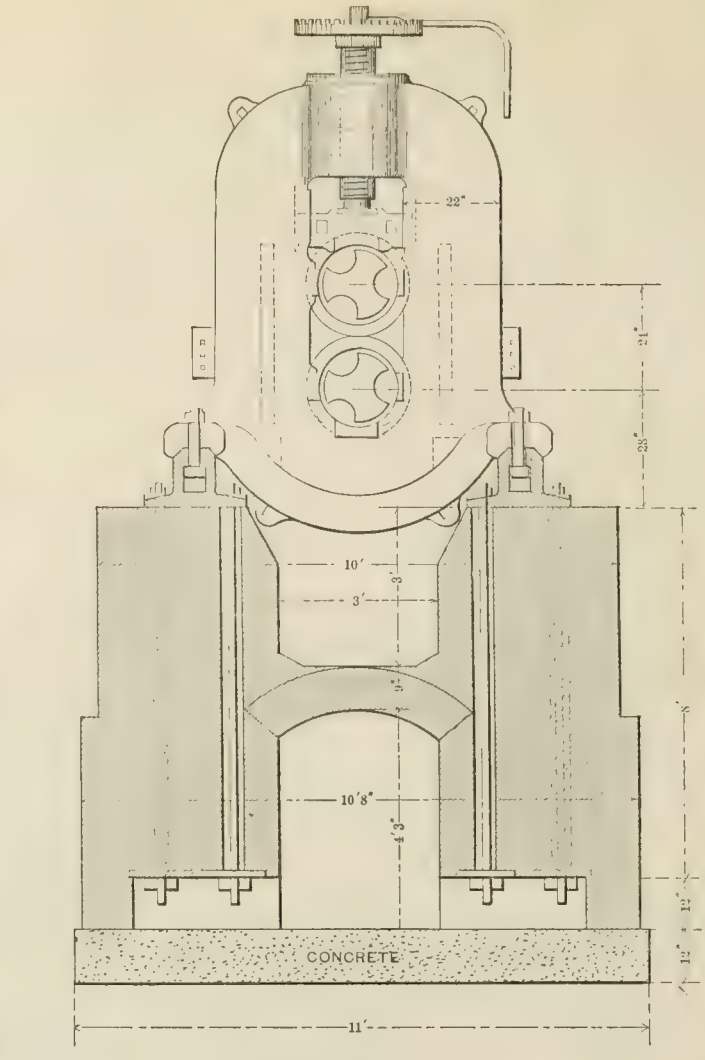


Fig. 6.—Sheet Mill Housing, Booth Design, 1893.—24-Inch Rolls.—Weight, 23,000 Pounds.

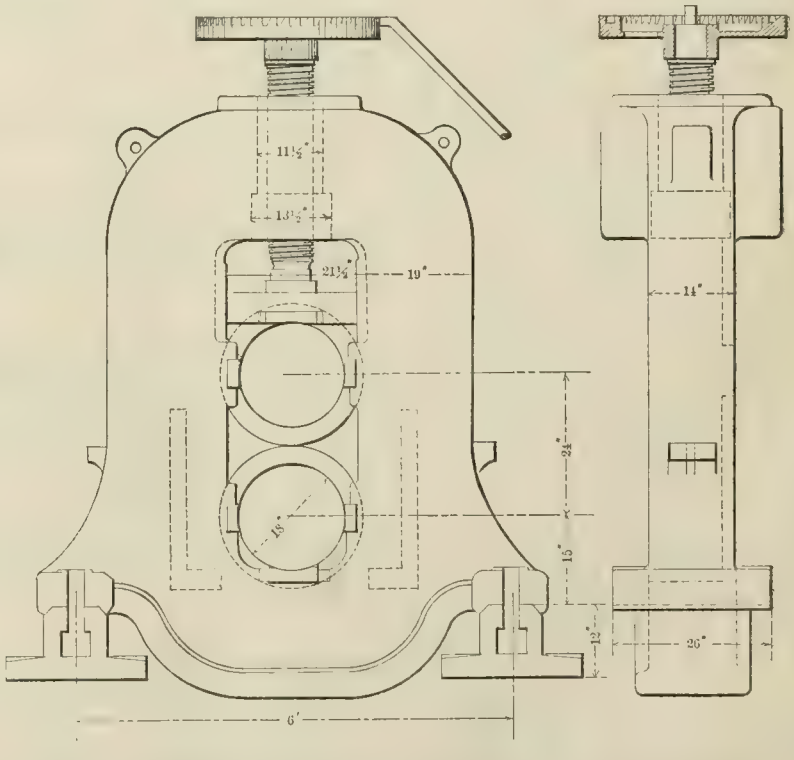


Fig. 7.—Sheet Mill Housing, Lewis Design, 1893.—24-Inch Rolls.—Weight, 19,500 Pounds.

SHEET MILL PROGRESS.

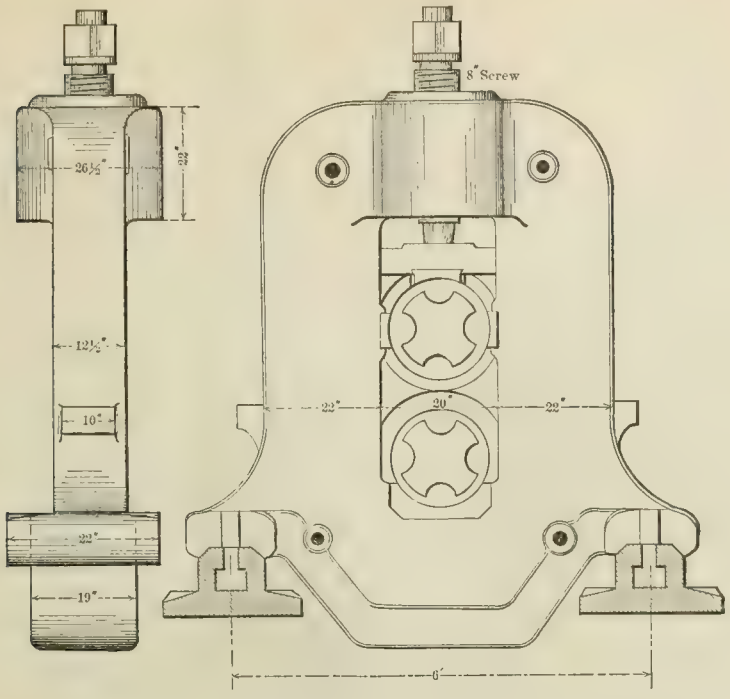


Fig. 8.—Sheet Mill Housing, Leechburg Design.—24-Inch Rolls.—Weight, 21,000 Pounds.

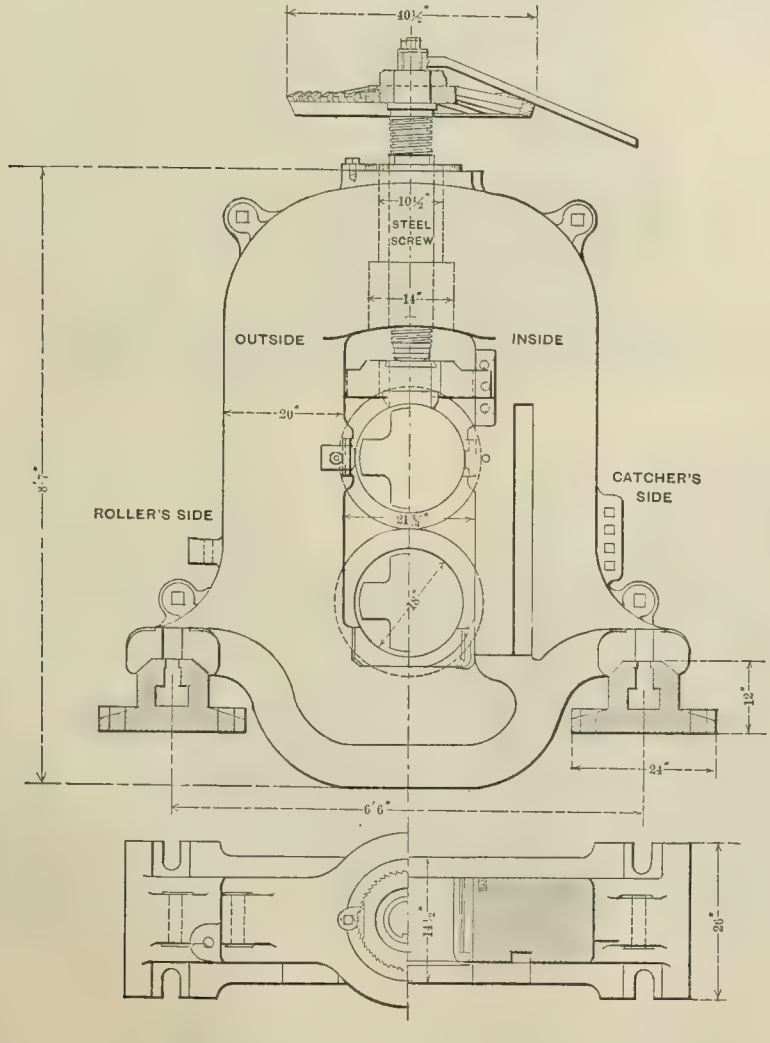


Fig. 9.—Sheet Mill Housing, Garrison Design.—Weight, 21,000 Pounds.

SHEET MILL PROGRESS.

bar is placed, and upon this sheet scrap bent to the length of the bar is piled, another muck bar is placed on top of the scrap, then more scrap and a third muck bar on top of the fagot. The whole pile or fagot is then about 12 inches high, it is reduced by means of a screw to a hight of 7 or 8 inches and bound together with round iron ¼ inch diameter. It is necessary that iron be used for binding, if steel is used it will not unite with the muck bar and a seam is left in the bar. In this manner nearly all the scrap can be worked up into such shape that only one heat is required to roll into sheet bars ready for use. Attempts have often been made to work scrap fagots in this manner without using muck bars but without success. The scrap works dry and muck bar is necessary as a flux. The proportion of scrap to muck bar in a well made fagot is about two-thirds. This plan of using scrap is second only in cheapness to the practice of rolling sheets from ends of boiler and ship plate. In Scotland large quantities of sheets are made in this manner, but American shipyards are not so numerous, and only a limited quantity of the material can be obtained.

Having described the general methods of rolling sheets of iron or steel and noted the changes made in machinery during the past 20 years this article would not be complete without reference to the attempts recently made to revolutionize the method of rolling sheets.

Continuous Mills.

Last year a patent was granted to William Garrett, Joliet, Ill., for a progressive process of rolling iron and steel sheets. If the process was ever given a trial the fact has not been made public, but experiments were made in an Indiana mill last year which embodied some important points of Mr. Garrett's plan. In sheet mill practice it has always been a custom to use only one pair of chilled rolls, upon which the work of molding out, running over and finishing is done. The reason given for this being that if sheets molded out through one pair of rolls are taken to another pair of rolls to complete the process of elongation, the fit or concave shape of the two pairs of rolls would not be the same unless they were turned exactly alike and were subjected to precisely the same amount of work and degree of heat. To preserve a uniform shape the rolls must each have the same treatment. If this shape is not equal buckling or dishing will result when a pack of sheets is taken from one stand of rolls to the other. If the finishing rolls are more concave in shape than the other pair the edges of the pack will elongate faster than the sides, and buckling will result, but if the conditions are contrary the middle of the pack will elongate faster than the sides, and the pack will be dished. This is the established theory of sheet iron rollers for years past, and the experiments made in Indiana seem to have proved that it is correct. A plan of the mill in which experiments were made is presented herewith, Fig. 10. The roughing mill was provided with four pair furnaces which were kept full of bars. When taken from the pair furnaces bars were passed through the sand rolls and molded out to about No. 18 gauge on one of the two pairs of chilled rolls; two roughers were employed who took turn about at the sand rolls, also two pair heaters. After being molded out the sheets were matched in threes and taken to the reheating furnaces and when ready were run over through

chilled rolls A in the finishing mill. They were then doubled and again heated, after which they were finished on chilled rolls B, and thrown off to squaring shears. The method was tried many times, and sometimes a good heat would be rolled, but the general result was "stickers, "pinched packs," "buckles" and other imperfections, and it was generally conceded that the old established theory regarding the fit of rolls was correct. It was expected that the output of the mills would be more than doubled as compared with old methods, but in this also disappoin'ment was met and the plan was finally abandoned. The mills have since been changed to old style, and old methods continue to hold full sway.

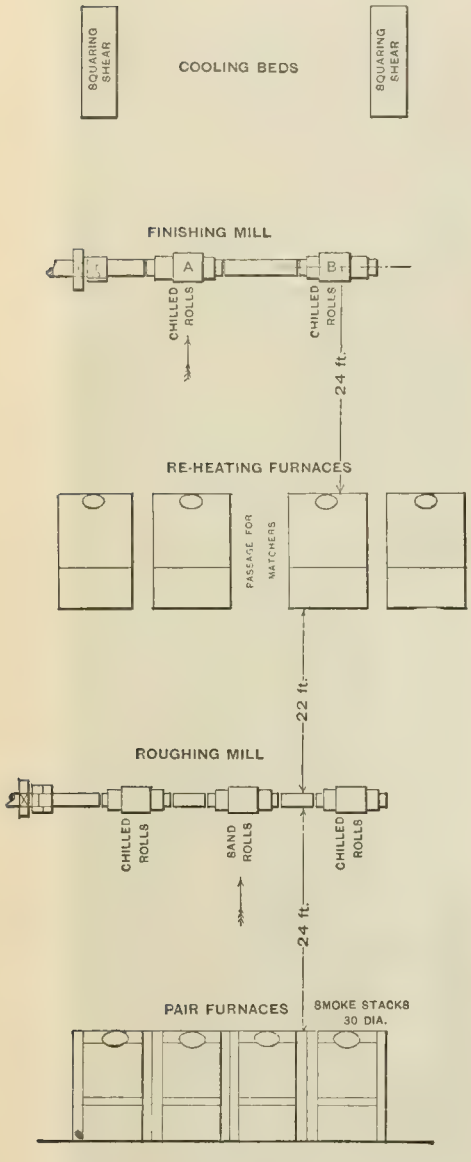


Fig. 10.—Plan of Experimental Continuous Sheet Mill.

If all other conditions and mechanical possibilities had been favorable the test of this plan would have resulted in failure, for the reason that there was a lack of concerted action on the part of the workmen and an evident opposition to the innovation. This indifference on the part of the men was apparent even to an outsider, and was in general line with their attitude toward all improvement that is liable to increase tonnage and reduce the number of men required to do a given quantity of work.

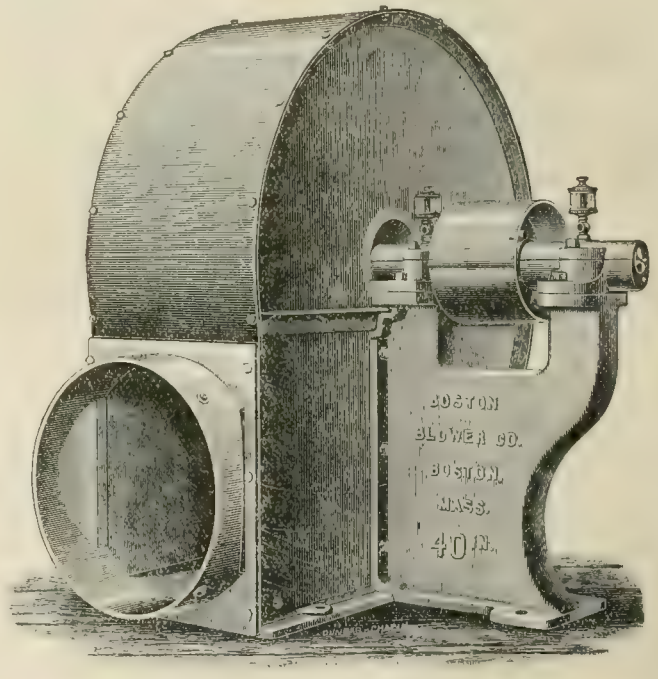
Since this article was written news comes from Bohemia that a method has been introduced by Carl Wittgenstein of Rudolfshutte, near Teplitz, by which means sheets about 150 feet long and No. 20 gauge are produced directly from the ingot with only one intermediate reheating, but so far the output has only reached 30 tons per day. Five stands of rolls are used and they are placed in continuous order. Nearly all the labor is performed automatically and only a few men are employed. Considering the enormous expense of the plant the output ought to be considerably over 30 tons per day to prove a paying investment. It will be noticed that sheets are only reduced to No. 20 gauge by this method. If Americans ever adopt this process they will have to use their wits and devise means for reducing sheets to much lighter gauge, as more sheets are sold lighter than No. 20 than are sold of heavier gauges.

A dozen or more different methods of rolling sheets have been heard of, but the inventors have so far failed to find the man with the money and energy to test their ideas. When that man is found we may hear of important sheet mill progress.

The Boston Steel Plate Exhauster.

The exhausters made by the Boston (Mass.) Blower Company are intended for removing shavings and sawdust from wood working machinery; dust from tumbling barrels or emery wheels, and for use in connection with hot-blast apparatus for conveying and distributing heat to hot rooms or dryers. They are made either single or double, and have heavy steel plate cases and jackets secured to angle irons. The angle iron to which the jacket is fastened is on the outside of the case, making it easy to remove if necessary, and at the same time giving a smooth and unobstructed surface on the inside of the machine. The fan wheels are made on heavy T-iron arms, which are cast into a solid cast iron hub, the floats and side plates being securely riveted to the same. These wheels are carefully balanced, as are also the pulleys. The shafts are of steel and the bearings, which are long, are provided with adjustable sight feed oilers.

The hanger, which is bolted to one side of case and extending to the floor, is a heavy iron casting of the box pattern cored out inside, thus securing a very rigid bearing and true alignment.



THE BOSTON STEEL PLATE EXHAUSTER.

A cement, which is said by an exchange to possess specially valuable properties for steam pipes in filling up small leaks, such as a blow hole in a casting, without the necessity of removing the injured piece, has been compounded. The cement in question is composed of 5 pounds paris white, 5 pounds yellow ocher, 10 pounds litharge, 5 pounds red lead and 4 pounds black oxide of manganese, these various materials being mixed with great thoroughness, a small quantity of asbestos and boiled oil being afterward added. The composition as thus prepared will set hard in from two to five hours, and possesses the advantage of not being subject to expansion and contraction to such an extent as to cause leakage afterward, and its efficiency in places difficult of access is of special importance.

Arthur B. Clarke, president of the Old Dominion Iron & Nail Works Co., Richmond, Va., visited the World's Fair some weeks ago, and on his return secured a large hall and delivered to the employees of the company, their families and other invited guests, a lecture on the great fair, which was richly illustrated with large stereopticon views. The instruction and entertainment was so popular that Mr. Clarke has been induced to repeat it several times with admittance charges, the proceeds being devoted to charitable objects of that city. Wherever delivered the houses are crowded, and many who could not visit the fair have had an enjoyable and instructive substitute. The interest thus shown in the pleasure and instruction of employees is worthy of a special commendation and might with advantage be imitated by other manufacturers.

The World's Fair Diploma.

Through the courtesy of the *Inland Printer* of Chicago, we print herewith a *fac-simile* of the diploma granted by the World's Fair, the accepted design being that of Will H. Low, New York. There seems to be considerable misunderstanding concerning the awards made. Announcements that a manufacturer has received the "highest award," the "first prize," &c., are not justified except under special circumstances. Every exhibitor obtaining an award at the World's Fair will receive a medal and a diploma. There is only one medal, bronze. All receive the same. It conveys no statement as to rank or relative quality of the exhibit. The only distinction there is lies in the wording of the award which is engrossed on the diploma. This is the finding of the jury. If the claims for superiority allowed by the jury, as forming the basis upon which the diploma has been granted, are clearly greater than those of any competitor, the manufacturer may be justly entitled to the assertion that he has received the highest award. In view of the large number of awards granted, successful exhibitors will closely study the verdict of the jury in their own case and in that of rivals.

THE WORLD'S FAIR DIPLOMA.

A Liverpool, England, hotel has put in some penny in the slot gas fires. This system is applied so that a fire in the grate can be turned on when required. The experiment has been tried in one bedroom for 12 months and having proved satisfactory the machines are now to be put into every bedroom of the hotel.

THE RETAIL STORE.

Exhibit Stand.

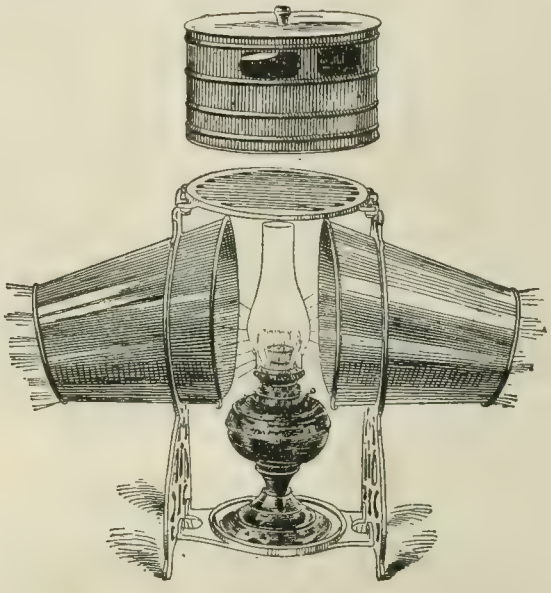
Silver & Co. of 20 Warren street, New York, are putting on the market wrought iron stands for the exhibition of whatever goods a tradesman may have for sale. The illustration presented shows one of the exhibition

Exhibit Stand.

stands displaying their Royal Roaster. The stands are made with three or four uprights and with different number of shelves. They are japanned in different colors and ornamented. The stands are adapted for the display of crockery, hardware, household goods, and, shown with a line of Britannia tea pots, present a handsome appearance. They are made in standard sizes, but special sizes can be furnished if ordered in sufficient quantity.

The Climax Lamp Stove.

Clarence M. Kemp, 101 North Frederick street, Baltimore, Md., has just placed upon the market a lamp stove of novel construction, intended for heating, lighting and cooking purposes. The illustration which we present shows so clearly the general arrangement of parts and the method of operation that extended description is unnecessary. Simply removing the top or heating drum discloses a large grate, which can be used for boiling, baking, roasting, heating flat irons, &c. The manufacturer states that the frame work is sufficiently strong to sustain a weight of over 100 pounds, and that the device can be set on the floor or on a table, as

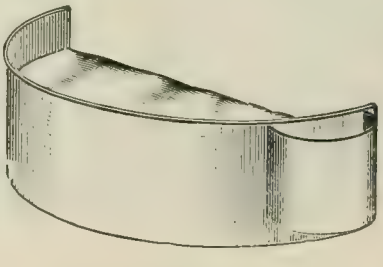


The Climax Lamp Stove.

may be most convenient. From an inspection of the cut it will be seen that the position of the lamp is such that it can be instantly removed without disturbing other portions of the stove. Mr. Kemp states that this stove does all that any other lamp or oil stove will do, and in addition warms the feet, as it throws the heat to the floor.

Patent Scrubbing Protector.

The illustration herewith shows a patent scrubbing protector invented by Mrs. Sarah Waterman, 722 Van Buren street, Milwaukee, Wis. It consists of



Patent Scrubbing Protector.

a galvanized iron tray, semicircular in shape, and a cushion. It is 2 feet long, 1 foot wide and 7 inches high. The tray is so made that no sharp edges are left to scratch even a polished floor. In use it brings the weight of the body entirely on the knees, which rest comfortably on a cushion instead of on the hard floor, and by its hight relieves the feet and toes of a disagreeable, cramped position. Probably more important is the protection from wet skirts and clothing it affords. It is provided with a cup at one side for holding soap or a scrubbing brush, and a ring for hanging it up when not in use. The right to manufacture and sell it in New York City has been sold to E. Ridley & Sons, corner Grand and Allen streets.

MEMORANDA.

THE HARDWARE FIRM of Heacock & Durfee of Gloversville, N.Y., have been dissolved. The first named will, however, continue the business.

TRACY BROTHERS, Ballston Spa, N Y., stove and hardware dealers, have completed in the rear of their mammoth store a splendid new storehouse to take the place of the one recently destroyed by fire.

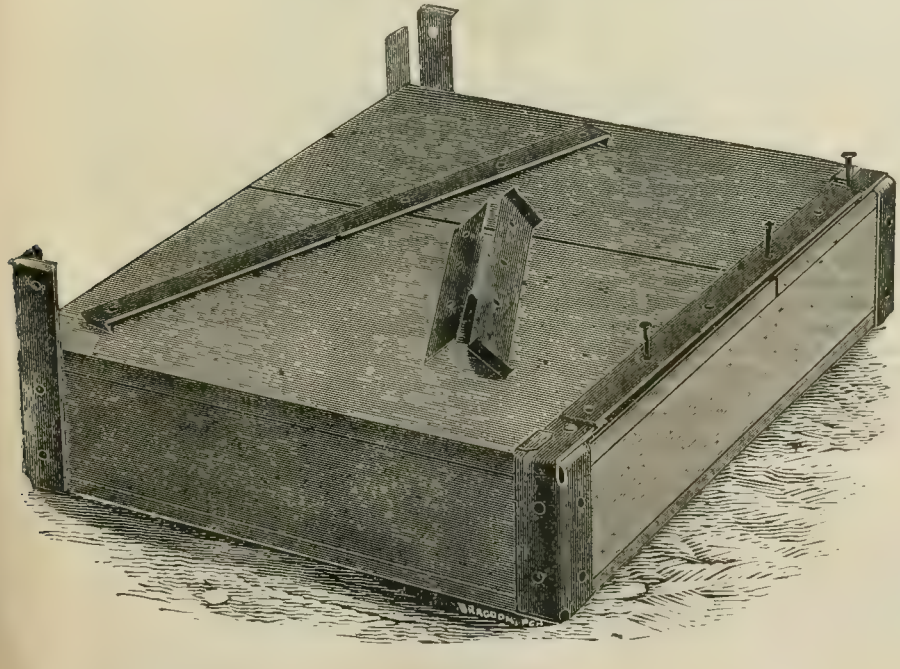
BRADLEY & HUBBARD MFG. COMPANY, 26-28 Park Place, New York, have rehabilitated their extensive display rooms, renewed their samples and otherwise completely effaced the ruin accomplished by the recent fire. On entering from the street, at the foot of the stairs leading to the main floor, they have a large show window which is kept brilliantly lighted by electricity so as to effectively display the high class goods, consisting of Lamps, Shades, Statuary and other articles contained in it. On the floor above, where their line is really seen, will be found some very recent attractions in the way of Venetian Iron Work in dead black. Many of these goods are not of the customary wrought iron, but have been successfully made of cast iron to resemble the genuine and more expensive goods. These wares are offered at approximately one half the usual cost.

Among the kinds of goods treated in this manner may be mentioned Andirons, Fenders, Fire Sets (including Shovel, Tongs and Poker). They have likewise brought out lines of goods of cast iron finished in brass plate, which for delicacy of treatment and excellence of design will readily pass for real cast brass.

Meriden Bronze Company, 30 Park place, New York, in addition to several other recent departures in the way of supplementing their already large line of fine lamps, table and art goods, have just brought out an assortment of hall lanterns for gas in Venetian wrought iron work, consisting of many attractive shapes and designs in dead black finish. There are also a number of chandeliers for gas of the same character of workmanship, together with a line of chandeliers of the same sort, finished in real gold plate, some of which also combine onyx effects. These goods were all prepared for the current season's trade and have just been placed in their showrooms.

Box Strap and Corner Iron.

The accompanying cut represents a box strap and corner iron being introduced by Dunshee & Snowden, McKeesport, Pa. One of the straps and one of the corner irons are shown across the top of the box, in the cut, while straps and corners are fastened to the box, to show the manner in which they are applied. After the corner piece has been nailed in position its wings or ends at

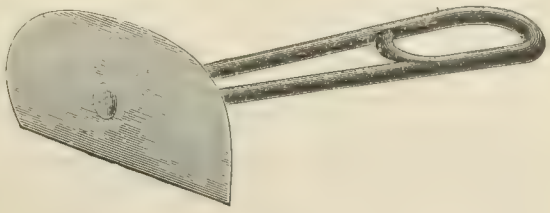


Box Strap and Corner Iron.

top and bottom are bent across one another. One of the wings at each end has hook shaped ends, which are engaged with similar hook shaped ends on the strap pieces when put in position on the box and then hammered together. The straps and corners have countersunk holes, to allow the edges of the holes to be driven into the wood, and to prevent the nails or screws projecting beyond the surface of the metal. The side edges of the straps and corner irons are beveled or curved, to prevent the otherwise sharp edges of the irons catching against persons or other boxes, and to provide runners upon which the boxes may be easily slid. The object of the device is to adapt boxes of somewhat frail construction to receive and transport materials of great weight. The manufacturers remark that the straps and corner irons are well adapted to boxes for tin plate, as shown in the cut, and that the corner irons and bottom strips are best put on during the construction of the box. Straps and corner irons suitable for boxes of any size are made to order.

Smith's Novelty Scraper.

Fernando B. Smith, Canton, Ohio, is putting on the market the scraper herewith shown. The scraper is well and strongly made, a steel blade being attached to a malleable iron japanned handle. The manufacturer remarks that with it any kitchen utensil can be cleaned, whatever its shape—corners, angles, flat and round surfaces, any kind of kettles, sinks, chopping bowls, tables, cupboards, molding boards, rolling pins, bread and pudding pans, &c. It is further remarked that fish are easily cleaned with the scraper, and that it will be found useful for scraping walls preparatory to papering. The point is made that in its use the hands are not soiled, as it is not necessary to put them into hot or greasy water, and that all danger of cutting or burning the hands or tearing the finger nails is avoided.



Smith's Novelty Scraper.

According to the calculation of Shelford Bidwell there are no fewer than 200 tons of sulphuric acid in the air of London on a cold day.

Linenoid Goods.

Crane Brothers, Westfield, Mass., manufacture a line of goods made of linenoid, including seamless pleasure boats, canoes, warehouse and mill baskets; butchers', grocers', bakers' and laundry baskets; desk, office and school baskets; bathtubs, washtubs, umbrella holders, &c. The manufacturers state that in making linenoid nothing is used but the strongest new linen stock, such as linen threads, canvas cuttings, &c., which, after being reduced to pulp in a beating engine, and chemically treated to render it impervious to water, is run on a cylinder machine into endless sheets of any size and thickness. It is then molded on wooden or iron forms, subjected to great heat and pressure, which, it is stated, results in a material that cannot be broken; that is light, tough, water proof, durable, taking a high polish, and similar in appearance to rawhide. It is remarked by the manufacturers that owing to their method of molding boats on forms, and thus making them seamless, they have what makers of wooden boats have been aiming to produce for years—absolute freedom from leakage. Another advantage mentioned is that, as there are no seams to open, the boats are not affected by heat or cold, will not warp, crack or split, and gain no weight by use.

Improved Lamp.

Clark Bros. Lamp, Brass & Copper Company, 43–45 College Place, New York, and Trenton, N. J., whose plant is operated by the American Lamp & Brass Company, are introducing an improved center draft lamp, the main features of which are alluded to by them as follows: The fount has sufficient oil capacity to burn eight hours. There is a patented feeder cup, with double seating, making it oil tight, also a lift guide of extra length. A patented concave chimney gallery contains 1080 extra large perforated air conductors, making, it is remarked, by improved combustion a reduction in heat equivalent to 40° F. by actual test. There is likewise a new chimney lift and beaded top center tube to keep the flame spreader from direct contact with the wick, thereby preventing the weeping of oil down the center tube. It is also provided with an improved wicking device. This lamp carries an 8-inch wick.

Immigration returns for October show the number of aliens entered during that month to have been less than half the average for the season. Last year 36,798 were landed in October, but this year the number sunk to 15,466. The authorities attribute the falling off to the business depression in this country having prevented people from sending prepaid passage tickets to their friends in Europe.

STOVE TRADE NOTES.

Future of the Hot Air Furnace.

By A. W. Glessner,

President of the Excelsior Steel Furnace Company.

CASINGS.

In any discussion of the furnace question the casing should receive consideration, not that it is such an extremely important part of the equipment of the hot air furnace, but rather because it is one factor of the whole and contributes its quota to the success or failure of the completed apparatus. The casing, like all other parts of the modern hot air furnace, has had its evolutions and traditions, but it may be said to have at last settled down to its original form —the single casing—with some modifications, which will be referred to further on. Russia or smooth refined iron, I am told, was used for the first casing, but galvanized iron soon replaced that metal, probably owing to its cheapness as compared with the first and its superior appearance as compared with the second metal, and galvanized iron has continued in use, except for room heaters, for which Russia or American planished iron is still used.

The single galvanized iron casing is open to the objection of radiating into the basement too large a proportion of the heat generated by the furnace, and to avoid this loss by radiation the double casing was devised, consisting of an inner casing of black or galvanized iron about 2 inches smaller in diameter than the outer one and held in position by the same rings. This is a great improvement over the single casing. One disadvantage urged against the adoption of the double casing was the taking of valuable space by the inner casing.

In many constructions of furnaces too little space is provided between the fire pot and radiator and the casing, with the result that it is often impossible to admit a sufficiently large volume of air to pass up through the furnace, and this leads to the heating of the air supply to a degree of temperature entirely too high to be consistent with first class heating, and the double casing was found to aggravate this frequent trouble. Complaints of this nature probably led to the substitution of corrugated tin lining, which has found a place in a very large proportion of the casings now made in cities where there is a call for a casing better than the ordinary common single one. This lining takes up little room, is effective, and above all, inexpensive.

One manufacturer of furnaces, I have been informed, has made thousands of yards of this corrugated tin lining and supplied the same to his customers at a nominal figure, owing to the fact that the use of the lining would make the work of his furnace more satisfactory and he could in consequence afford to forego all profit on the lining if he could get his customers to use the same on the casings which they made.

Another form of modern casing, and one which is growing in popularity very rapidly, is the single casing lined on the inside with two or more thicknesses of asbestos paper. This form of casing has been brought to the attention of the trade within the last 12 months and presents advantages over any of the casings heretofore described, for the reason that the paper occupies less space than the corrugated tin lining and at the same time is more effective, as paper is recognized as one of the best insulating materials that can be employed in connection with heating, whether by hot air or steam.

The discovery of asbestos has led to the production of many materials now used by heating engineers, and the placing on the market of a paste for attaching asbestos paper to furnace pipe and casings has made possible the construction of the improved furnace casing referred to. In point of cost the single casing lined with asbestos paper has the advantage over either of the casings referred to.

One peculiarity of the furnace trade that has been often remarked is that the best country trade as a rule uses a higher grade of material for the equipment of the modern furnace than the ordinary city trade, which is due in part to the fact that in large cities the house builder puts up buildings in long blocks and has brought the construction of such buildings to a science, and while putting them up so as to present a good appearance and equipping the same with appliances that will undoubtedly do their work, everything has been whittled down to the lowest possible cost and the slight extra cost of the improved casings and bonnets has been such as to prevent their use in a very large portion of the houses erected in the large cities. This is to be regretted, but nothing can be done to avoid the movement now in progress in the cities to take the building of homes largely out of the hands of the individual house owner and we must probably look to the country for the adoption of furnaces and fittings of the highest class.

(THE END.)

Jubilee of the Brand Stove Company.

The Brand Stove Company of Milwaukee, Wis., celebrated the twenty-fifth anniversary of the establishment of the enterprise on Saturday last, the 11th inst. We acknowledge the receipt of an invitation to be present, and regret that owing to the pressure of other business *The Metal Worker* was unrepresented. The invitations were souvenirs of the event, being handsomely gotten up. Cards were inclosed with them giving views of the stove plant in 1868 and in 1893. The contrast thus made is marked. The works in 1868 were very modest, consisting of two one-story buildings forming an L. Now the plant, which stands practically on the same site, covers a whole block, most of the buildings being from three to five stories in hight. The following account of the celebration on Saturday is taken from a Milwaukee paper:

The Brand Stove Company celebrated their twenty-fifth anniversary yesterday afternoon and evening with a banquet to their employees and to their friends and patrons. A space had been cleared in the north end of their large new storeroom at Sixth and Prairie streets and fitted up with tables in the shape of a right angle. The tables contained a delicious spread. Potted plants, flowers and ferns were arranged along the center of the tables and on the window sills. At a short distance from the festive board was seated Professor De Bona's band, which discoursed pleasant music.

A prominent feature of the celebration was the presentation of a gold watch and chain to the head of the firm, Sebastian Brand, by his employees. Vice-President Julius Goldschmidt, late United States Consul-General at Vienna, Austria, presented Mr. Brand with the gift and delivered a happy speech in which he congratulated Mr. Brand upon his success and the harmonious relations which had always existed between him and his workingmen, who to-day, tendered him a slight token of their esteem. Mr. Goldschmidt regretted that Frederick G. Brand, the secretary of the firm, was prevented by sickness from attending the silver jubilee of the concern. President Brand responded by saying that he felt proud of the friendly relations existing between the firm and its men and among its officers, and he felt deeply moved by the manifestation of esteem shown by his men.

The Brand Stove Company were incorporated in 1883. Previous to that time they existed as Brand & Co., who began operations on November 11, 1868, with 20 men, and whose total output for the first year did not exceed $5000. The firm now employ between 250 and 300 men, and the value of their annual output exceeds $250,000.

Among the invited guests present were Mayor John C. Koch, Ferdinand Kieckhefer, Charles S. Schmidt, Henry Bielefeld, W. H. Simpson, John Pritzlaff, Lorenz Maschauer, William Jahns, J. B. Kalveiage, August U. Krueger, Christ. Koerner, Herman Jacobi, Gustav Kayser, Henry Uecke, John Hern, Charles Hilgendorf, John F. Sivyer, Emil Weisskirch, John Graf, Philip Gross, Charles Foster, Charles Schloessing, F. Harnischfager, Henry Froedert, Jacob Knoernschild and John F. Helm.

Edward D. Ransom.

Edward Delavan Ransom, one of the most enterprising and popular citizens and business men of Albany, N. Y., died on Sunday, November 12, at his residence, 202 Lark street. He was apparently in his usual health upon retiring Saturday evening, but at 11 o'clock he was taken sick, and at 4 o'clock death ensued, the trouble being hemorrhage of the brain. Mr. Ransom was born in Ballston in the year 1851, removing early in life to Albany, where he resided until the time of his death. His connection with the stove trade was principally through his business in foundry facings and founders' supplies, although he was with the Ransom Stove Company and later with the Ransom Stove Works for a number of years in the capacity of general superintendent. In 1882 he formed a partnership with Samuel Charles under the name of Charles & Co., but on the death of Mr. Charles in 1883 the firm of E. D. Ransom & Co. was organized, with James D. Wasson as partner. In the year following J. S. Ransom was admitted, Mr. Wasson retiring in 1885. The two brothers conducted the business of foundry facings and founders' supplies until May, 1890, when E. D. Ransom became sole proprietor.

Mr. Ransom was a man of sterling

qualities, honorable and upright in his business relations and genial and popular in his social life. He was a member and trustee of the Second Presbyterian Church, a member of the Fort Orange Club and of Company A Old Guard. He leaves a widow and a son. The funeral services were held on Tuesday, November 14, from his late residence.

William V. Channon.

The stove trade of the West will learn with regret of the death of William V. Channon, president of the Channon-Emery Stove Company of Quincy, Ill. Mr. Channon, whose portrait we present herewith, was ill but little more than a week, and his condition was not considered serious until a day or two before his death, which occurred at 4 o'clock on the morning of Thursday, November 9.

WILLIAM V. CHANNON.

He was born in the town of Honiton, Devonshire, England, on November 26, 1812, and was therefore 81 years old at the time of his death. He was educated in the schools of his native country and later learned the trade of paper making in Devonshire. In the year 1841 he came to America and went to Philadelphia to seek employment at his trade. As nearly everything was imported he found it difficult to secure work, but after a faithful search he finally secured a situation in a wholesale dry goods house, where he remained several years, serving in various capacities. His ambition, however, was to locate in the West, and in August, 1848, he went to Quincy, Ill., where he found trade dull and the outlook rather discouraging. Being possessed with a determination to succeed, he served in various capacities until 1852, when he obtained steady employment in what was known as the Comstock Foundry. He remained with Comstock & Co. until 1865, when he entered the new foundry of Bonnett & Duffy, where he was engaged for four years. He then returned to the Comstock Foundry, which had been reorganized, remaining there until he and Joseph W. Emery constructed their foundry at the corner of Fifth and Ohio streets. When the stock company was formed Mr. Channon was elected president, which position he occupied at the time of his death. Despite his advanced years he was active in his business, and under his management the company rapidly increased their trade, which extended to all parts of the country.

The funeral services were held at 3 o'clock on the afternoon of Saturday, November 11, at his late residence, 217 South Eighteenth street.

That Curious Old Stove.

We have a letter from Leicester Allen, Brooklyn, N. Y., in which he says:

The old stove noticed and illustrated in the issue of *The Metal Worker* for November 11, is not the only one of its kind that could be unearthed in the United States. I recognized the design at once as an old acquaintance of my boyhood's school days. As late as 1838, in a country schoolhouse in the town of Smithfield, Madison County, N. Y., the head of the continental soldier (who had suffered decapitation by a crack in the back plate extending entirely across) was a favorite mark for the mischievous schoolboys—of whom I was one—seated on the back seat of that time honored institution of learning. As the inhabitants of that locality were never noted for liberality in the matter of furnishing schoolhouses, this old stove may be there yet. The plates were enormously thick—I should think at least 1¼ inches. Whence it came or who manufactured it I am unable to say. It was undoubtedly one of the earliest specimens of iron founding in this country, provided it was made here at all, which I do not regard as improbable, as the design strongly indicates an American origin.

The Portsmouth Stove and Range Company

of Portsmouth, Ohio, have issued a very neat catalogue illustrating and describing their leading specialties. The place of honor is given to the Northern Queen, a four-hole range embodying the modern features and ornamented in an attractive manner. It is made in several sizes and various styles, some of which are illustrated. The Southern Queen is a companion to the stove just described and is made in the usual varieties. Among the cook stoves we find the Northern Queen, a substantial four-hole construction offered in several sizes; the Southern Queen, intended for burning coal or wood; the Exposition, the Welcome, Domestic, Derby and Queen. A four-hole construction intended for burning wood only is known as My Queen, and has the same sheet flue construction employed in connection with the Northern Queen coal range. The decorative features are also the same as that of the stove mentioned. Some of the other goods include the Victoria, Arcade, Indianola, Excel and Relief cook stoves; the Guarantee, a neat square cottage parlor heater; the Franklin, an attractive open stove; the Pansy, a sheet iron cylinder heater; the Climax box, the Mogal, Erie, Burnside, Star and Spray globe and cannon stoves. Some designs of square and oval grates, sugar kettles and price-lists of hollow ware, &c., complete the catalogue, which is printed on good paper and bound in colored paper covers.

ODD PLATES.

Buck's Stove & Range Company, St. Louis, Mo., favor us with a copy of the Kansas City *Star*, printed at Kansas City, Mo. The entire back page of the paper is occupied by an advertisement of Buck's stoves and ranges by the J. H. North Furniture & Carpet Company, who are agents for these stoves in Kansas City, Mo. The advertisement referred to is one of the most striking we have seen for some time, there being 18 trade-mark cuts and 21 stove cuts, making a page that is at once unique and effective.

Special dispathces to the Indianapolis papers state that on November 9 a suit was instituted for the appointment of a receiver for the Wells Mfg. Company, proprietors of the Greenfield Stove Works, at Greenfield, Ill.

The Norcross Regulator Company, 6 Friend street, Boston, Mass., have bought out the furnace business formerly carried on by Moses Pond & Co. at 79 Blackstone street, and will continue the manufacture of Pond's furnaces and ranges, with foundries at South Newmarket, N. H., and East Bridgewater, Mass.

During the recent fair held at Dallas, Texas, Sam Shannon, Texas representative of the Excelsior Mfg. Company, St. Louis, had his hands full with a party of Shriners from Galveston. Mr. Shannon showed the Shriners all the sights of Dallas, and all those acquainted with the genial Sam know that those under his care had a good time.

W. M. Barber, representing the Smith & Anthony Company of Boston, Mass., was in Waterbury, Vt., recently looking after the installation of the heating apparatus in the asylum buildings, for which the company named have the contract.

The Peninsular Stove Company send us from their Chicago office a four-page folder illustrating and describing their new Radiant Peninsular furnace, which is claimed to be a quick and powerful heater, adapted for burning hard or soft coal, coke or natural gas. One of the special features to which attention is invited is the return flue radiator, the arrangement of parts being such that the heat makes a complete circle before reaching the smoke pipe. Another feature is the company's patent duplex grate and annular shaking ring, so constructed as to prevent the accumulation of clinkers and cleansing thoroughly the fire pot of all dead matter. The device is self mounting, requiring therefore but a few seconds to remove the entire grate through the ash pit door. The makers state that it can be replaced with equal facility.

The Chicago & Erie Stove Company of Erie, Pa., have issued a neat circular calling attention to their line of gas ranges with steel oven improvements, for which they make many claims. The circular states that by the company's plan retail dealers can show cast ranges in the same style, shape and finish as steel ranges, with quick oven, without extra cost to them. The goods are made in many styles and sizes, with four and six holes. Dealers who have handled these ranges refer to their operation in very flattering terms, and the company expect a large business.

The Excelsior Steel Furnace Company, 110 to 114 South Jefferson street, Chicago, have just started a new machine of their own design and construction which double seams five joints of furnace pipe at one operation. It not only does its work beautifully but rapidly, turning out about 15,000 feet of pipe per day.

Mrs. Sarah Waterman of 722 Van Buren street, Milwaukee, Wis., the well-known inventor of the Waterman adjustable interlocking stove cover and several other useful household articles, has recently been granted patents for a patent ash receiver for stoves. It is calculated to decrease the space required for setting a stove by doing away with the end hearth and deep hearth of cooking stoves and ranges, which are easily broken in shipment and are difficult to replace. It is also adapted for use with heating stoves and is intended to relieve the task of removing ashes from stoves of much that is disagreeable and to entirely avoid the dust that makes so much work for the housewife. It consists of three parts and requires the stove to be made with a hole in the bottom under the grate and three ledges or grooves and low, wide slots at the front. The first part is a thin grating that slides in and out under the hole in the bottom through one of the slots at the front and is used as a sifter. The second part is a thin plate that entirely closes the hole in the bottom or when pulled out through one of the slots at the front lets everthing fall into the ash receiver beneath. The ash receiver is a drawer more or less deep that slides on grooves and can be removed without raising any dust.

Luther & Lederhos, 30 Cliff street, New York, manufacturers of gas and oil stoves, have placed on the market the Brilliant Star gas heating stove, which possesses many new features. It has a door for lighting, which the makers state is a great improvement, as it not only answers the purpose of lighting, but at the same time one can readily see that all the jets are burning, which in the old style is claimed to be impossible without getting down on the knees. A polished nickel rim on the top gives a fine effect. In the door is a star, and with the body of flame back of it one may see that it is what the name implies, a "Brilliant Star." It is made in five sizes.

One of the departments of Rathbone, Sard & Co.'s stove manufacturing plant, at Albany, N. Y., has closed down until spring, causing the laying off of about 200 employees.

The foundry of the Bussey & McLeod Stove Company, Troy, N. Y., was damaged by fire on the evening of November 9. The fire originated on the fourth floor, in the mounting department, and is supposed to have been caused by sparks from the cupola falling among a lot of patterns. The watchman discovered the blaze and was nearly overcome by the smoke. The fire was conquered after an hour of hard fighting. The damage to the foundry will probably reach $1000, as many valuable castings were damaged. The works had only resumed operations the day previous.

Some time since an article appeared in one of the Cincinnati papers intimating an attempted reduction of wages on the part of the Favorite Stove & Range Company of Piqua, Ohio, and the employment of convict labor, which has brought out from the concern named an emphatic denial that any such step was contemplated, and that no one connected in any manner with the company "ever thought of employing convict labor." The company say that there was a slight difference in the price of molding hollow ware between this foundry and others making the same class of fine ware, but that this difference was adjusted in a pleasant and entirely satisfactory manner without the least disturbance. The company also state that they operated their works the entire year of 1893, in addition to increasing their capacity largely, and worked full time with a complete force of hands, consisting of about 350 employees. The statement is also made that convict labor could not make Favorite stoves and ranges, as it requires the most skillful workmen which the company can employ to produce them. In the letter which the company issued in regard to this matter they conclude as follows: "There is not the least indication of any disturbance in our labor circles, hence the article referred to is false in every particular."

J. Allison Orr of the Mount Penn Stove Works, Reading, Pa., has been in town during the past week calling on his friends in the trade. During his stay in the Metropolis he was the guest of Sam S. Utter.

The business of the Kearns Wrought Steel Range Company, manufacturers of steel ranges and hot water stoves, with office and store at 1020 Arch street, Philadelphia, and factory at Burlington, N. J., has been sold out to John J. Kearns and Charles Rudolph, who will in future carry on business under the name or style of the Kearns & Rudolph Range Company. The members composing the new concern are men of practical experience, and the business under their management will doubtless continue its rapid growth. It is the intention of the partners, in addition to the already large stock of goods carried, to carry a complete line of culinary utensils, in order to enable them to fully equip hotel and family kitchens with all the appliances known to culinary science.

W. H. Whitehead of the Chicago & Erie Stove Company spent a portion of the past week in Chicago. Mr. Whitehead takes a philosophical view of the situation in the stove trade, and discourses cheerfully regarding circumstances commonly considered discouraging.

The Michigan Stove Company are distributing book marks to their customers to be used as advertising devices. They are furnished in sets of four. They are made of fine paper, lithographed in imitation of silk ribbon, each bearing a pleasing picture of a child on the obverse side. The reverse is devoted to some remarks concerning Garland stoves and ranges.

We are indebted to McKenney & Waterbury of 181 Franklin and 164 Congress streets, Boston, Mass., for a copy of the fall and winter catalogue which they have just issued relating to gas stoves. The lines shown cover heaters of various description, together with gas radiators, gas burners, tubing, &c. The Brilliant Star gas heater is first considered, following which we find the Home Comfort, the Enterprise reflecting gas heater, the Pilot, a sheet iron cylinder stove, the Enterprise gas log, the Eclipse and the Charm. In connection with the illustrations is presented brief descriptive particulars, together with prices of the various sizes in which the goods are made.

A recent issue of the Portsmouth *Blade*, published at Portsmouth, Ohio, contains a somewhat lengthy reference to the Portsmouth Stove & Range Company, who are referred to as "one of the two establishments in the State that never banked their fires on account of the scarcity of money, want, general distress and bankruptcy that have strewn the channels of commerce with wreckage the past four months the country over." The article states that the goods of the company are in demand in many sections of the country, and that the makers have at times been embarrassed in their efforts to promptly fill orders. The statement is made that something over six weeks ago they were compelled to call in their traveling men on this account, and that the company are now working more men than ever before. Their shipments for the month of October are said to have exceeded the sales for the same period in any year since they commenced business.

Mrs. Granville G. Hallett, the widow of Mr. Hallett, whose death was noticed in *The Metal Worker* of November 4, will, for the present, continue the business of her late husband at 92 Beekman street, New York City. Mr. Hallett's name is well known in connection with the Hallett ranges and the Hallett caboose stoves. He was also agent for other goods, and Mrs. Hallett will carry on the business, as it was her husband's wish that she should do so.

In the infringement case of the estate of P. D. Beckwith *vs.* the Detroit Stove Works, the United States Supreme Court handed down a decision on Monday, the 13th inst., in favor of the defendants.

Around the World in a Day.

BY JEEMS.

Eighty days is considered pretty good time to get around the world and you have to be humping yourself to do it, without leaving much time to look at anything. You can take a peep at things as you pass by, but not much more. A good many people only had a day at the gigantic Chicago fair, but if they even took a squint or half a squint at things, it was equivalent to a trip around the world. In fact, outside of land and water views, you could see more in one day in Chicago than you could on an 80-day trip around the world. The fact is, every one who saw Chicago's stupendous exhibition has seen all the world and more, too, while those who did not see it have missed the trip, and a trip that they may never have an opportunity to take again.

To Chicago belongs the credit of giving to the world at large the greatest object lesson ever projected, and let us all honor her for it. It is very easy for critics to say how it ought to have been, and no doubt many improvements could be made now, but to do what has been done Chicago deserves the admiration and respect of the people of the United States, which is but a small recompense for this gigantic work. As so much has been written about the fair by experienced people and so many have seen it, any description of it by me would be superfluous, but I would like to add an humble testimonial to its great worth, as I had an opportunity to accompany the boss over to the last two Paris exhibitions and to the New Orleans show, and last, but not least, to the great World's Fair, at Jamaica, W. I., where a good many of the natives felt that they had a show "of course not so great as Paris, but we think it is very fine," as one of the natives told me, but really it was not much more than one of our populous county fairs in point of attractions; and while nothing could be said or written by me of Chicago's pride that would add one iota to its fame, still I find it a great pleasure to testify to its grandeur and superiority to anything that has ever yet been attempted of this kind by any nation. Of course, there is a hypercritical, captious set of people, who, had they been consulted, could have put the thing in a real proper shape; but as they were not asked for suggestions they think the thing is tolerable, but—. The world is full of them; if they could get hold of the Lord they think they could just put Him on the right road to run the universe. No doubt they are very good men, but they "can't keep a hotel," as Jerry Bryant used to say.

LEARNING TO SPEND MONEY.

Some of the stove men in Chicago say stove trade is poor because the people "spent their money in going to the fair and can't buy stoves, &c.," and other traders say the same thing. I don't believe any such theory. It seems to me when the cold day comes that stoves will be bought if they mortgage the farm. Why, the people are just seeing how to spend their money. A new era of wants will arise; more than that, they will be supplied. The visitors had their eyes opened and saw the wonders of the world, useful as well as ornamental. While the inventors and schemers were busy studying out points for the future, others were making up their mind what they would have and what they would like to have if they had the money, and when they get it they will buy, and those that have got it will begin to get their wants, and spending money will be more in order than hoarding it. We are a nation of wanters and spenders; trot out your goods, &c., and they will go into circulation.

This is what is going to give an immense impetus to the growth of the United States. Agriculture, mining and manufactures will be stimulated beyond anything we have yet experienced. Millions of people have seen the products of the world in every department that they never dreamed or thought of; and further, many people who have hoarded money will begin to spend it, as stated before, because they have found an entirely new set of wants. New homes, new furniture, new clothes, new everything will be demanded, &c., and a mighty ball will be set in motion that will send the country along at a tremendous rate. How it is possible for any one to have seen this huge show and not feel this way I cannot conceive. If you find croakers predicting ruin and desolation set it down as a rule they did not see the fair.

All this will be done, not by the great political parties and politicians who are continually reminding us of their great value and how they make the thing go. It will be carried on by the people who can and are running their own affairs, and have done it in spite of these great claimants. So, I say, heap the honors on the people of Chicago; you can't say too much. The fact is, the Government of the United States should pay the whole bill, for the country at large is the gainer by the vast exposition.

AVE CHICAGO.

There is one thing the Chicago people appear to derive intense satisfaction from—that is, that the great exhibition has demonstrated their superior ability to the effete East, and, while they are booming ahead, the East is sinking out of sight. But west of Chicago the same feeling exists; they are the coming man and Chicago is in the rear. This intense love and confidence and continuous lauding of the West is good solid business drumming; it catches on and sinks deep in the hearts of the wild and woolly Westeners. The finest exemplification of this talent was given by the old gentleman who lectured on the car which contained the products of the country traversed by the Northern Pacific road. There was a continuous crowd passing through the car, and the solid facts and figures which he slung at them were overwhelming, advancing the claims of his great territory, the "land of four seasons," as he termed it, and the way he socked it to the East was a caution. I sat in a chair and enjoyed the lecture hugely. In fact, it made me feel bad because my native land was the Bowery, and I felt myself wanting to fly to the "four season country," but—upon reflection—he never mentioned that they had a Bowery, and I thought after all that a Bowery of one season would be better suited to one of my youth than the quadruple arrangement so eloquently sat forth. While ruminating on the matter I was much startled to hear the vehement and stentorian lecturer—for he put as much energy in his speech as if he was addressing a political meeting—say, "Why, we have kept the Chicago people from being paupers; yes, kept you out of the poorhouse!" and he poured forth the reasons for it.

This surprised me, and instead of Chicago supporting the East she herself was being supported by her more vigorous Western brothers. About the size of it was that Chicago was East, and had become addicted to Eastern indolence and sloth. I am sorry he made this statement, because it will breed unhappiness. I saw several of the "four season" constituents, at least I supposed they were, looked very miserable when they found they had been working so hard just to keep the Chicagoans from being paupers. This will be a blight on their lives, and perhaps they will go home and never work any more and let 'em go to the poorhouse. Why should we trouble ourselves about keeping Chicago out of the poorhouse. It is this intense feeling and rivalry in the West that makes it grow and will continue to do it, but the East is all right, she will get her share. If we were to change the name of the United States to Chicago and number all the States as wards she would work just as hard to add Canada and South America as new wards run her famous streets from Baffins Bay to Cape Horn, and from the Golden Gate to Maine, and after she had finished would clap her eyes on Europe and divide it up in wards. The truth is Chicago wants to be the universe, and she may, but the East will get along somehow, and if she has got to be a ward of Chicago so be it. But it will be Chicago's boast at that time to say "At last we own the Bowery." Just fancy if it should take place, what a shout would go up when they reached the famous chorus of that grand old song.

IN THE MATTER OF STOVES.

Like the great exposition, there is no end to this subject, yet it had to stop and so must I. It was rather unfortunate that the stove industry in all its branches, oil and gas, cooking included, could not have been grouped under one roof. It would have made an interesting exhibit, and perhaps might have benefited export trade. The Michigan Stove Works' big stove is to be utilized as a summer residence by Fred Gardner. Fred has bought a shore front on the lake and will get the affair ready by next season. He will have it got up in real esthetic and high art style. The *salle de coal* will be fitted up in Louis Quinze fashion; the ash pan will be a picture gallery, with illustrations from the Midway—"Bedouins at Prayer," "Javanese Darning Socks," &c. The culinary department will be in the flues, and an elevator will run up the flue de smoke pipe. The poker hole is to be well supplied with chips, &c. In short, everything will be done to make it novel and interesting. On fine days the oven door side of the house will be swung wide open and the public will have the opportunity of seeing how a real first-class house should be run. As the big elephant on Coney Island is the first great wonder that all see who come over the ocean blue to the home of Chicago, as they approach the canal that goes past the village that is stretched on the Hudson opposite Jersey City, so when they reach the great Lake City they will observe this great stove as they enter it, looming up in all its majesty and grandeur, No doubt the effect will be overpowering, especially to Paddy when he first sees it. A special reporter ought to come on with the first Pats.

TRADE REPORT.

The Iron Market.

Attempts are being made to persuade people that things in the Iron market are improving, but evidences thereof are not very satisfactory. It would not require very much of a demand to start such a movement, however, and the chances in that direction are not unfavorable, but that the turn has actually been made is "not proven." Prices are in no case better than they were a week ago; there has been no general increase in the volume of business, and no tangible evidences that either of these desirable features are on the point of being immediately realized.

A more cheerful feeling has been manifested since the elections, however, and there is more inquiry for quotations, indicating that the trade are disposed to anticipate requirements, providing that developments are favorable, but confidence has not been strong enough to induce heavy purchases. It may also be noted that there is less pressure to sell, so that, taking everything into account, even if there has been no other gain, the disposition is to look for better times, rather than the reverse.

In Pig Iron there has been a somewhat livelier buying movement, notably in Cincinnati, where Pipe founders have covered the material for sales made. In Philadelphia contracts for about 24,000 tons of Cast Iron Pipe have been taken, a part being captured by a Southern foundry. Another Southern works has secured the contract at Waterbury for about 6700 tons. The Chicago market has been upset by a cut in freight rates on Southern Iron to $3.65 from Birmingham.

Pig Iron.—A very encouraging feature in the New York market, so far as the consumption of Pig Iron is concerned, is the appearance of a number of large orders for Cast Iron Pipe. Through Warren, Wood & Co. of this city, the Chattanooga Pipe & Foundry Company secured the order for 6700 tons of Pipe for Waterbury, Conn., at $23.52, delivered, per gross ton. The Howard Harrison Company of Bessemer, Ala., captured about 8000 tons of the 48-inch Pipe for Philadelphia at $24.12 per gross ton, delivered on the streets, the balance of the order, about 16,000 tons, going to Eastern shops. About 1300 tons has been closed for Burlington, Vt., and a good lot is coming up in Northern New York. We quote: Northern brands, $14 @ $15 for No. 1; $13 @ $14.25 for No. 2, at tidewater. Southern Iron, same delivery, $13 @ $14 for No. 1; $12 @ $13 for No. 2; $11.50 @ $12.25 for No. 3; $11.75 @ $12.25 for No. 2 Soft, and $12.25 @ $12.50 for No. 1 Soft.

In the Philadelphia market improvement is thought to be due, but it has not responded as promptly as could be desired. In most cases orders can be placed at the same prices as last week, and, so far, no one has had the courage to ask an advance. At the same time there is less pressure to sell, and buyers may not be entirely safe in postponing their orders much longer. The market is a waiting one, sales in the meanwhile being within the following range for Philadelphia deliveries:

No. 1 Foundry	$13 75 @ $14.25
No. 2 Foundry	13.00 @ 13.25

The most important event of the past week in Chicago was the decline in Southern freight rates of 20¢ ℔ ton to Chicago. It is expected that this reduction will only be temporary, but it has had the effect of reducing prices all along the line. It has not yet had the result of increasing sales, but it would be natural that buyers should take advantage of it as soon as the fact becomes generally known. The demand for Southern Iron for the past week has only been for small lots, although there are some inquiries for round lots which it is hoped may result in transactions at an early day. Business on local Coke Iron has been fair, but no heavy sales have taken place. The quotations made on this class of Iron are for small lots only. Concessions are given on sales of any size and in direct competition with Southern Iron prices are made to take the business. Quotations are now as follows for cash:

Lake Superior Charcoal	$16.00 @ $16.50
Local Coke Foundry, No. 1	13.50 @ 14.00
Local Coke Foundry, No. 2	12.75 @ 13.00
Local Coke Foundry, No. 3	12.25 @ 12.75
Local Scotch	14.00 @ 14.50
Ohio Strong Softeners No. 1	15.50 @ 16.00
Southern Silvery, No. 1	@ 14.25
Southern Silvery, No. 2	@ 13.75
Southern Coke, No. 2	11.85 @ 12.10
Southern Coke, No. 3	11.10 @ 11.35
Southern, No. 1, Soft	11.85 @ 12.10
Southern, No. 2, Soft	11.10 @ 11.35
Tennessee Charcoal, No. 1	16.00 @ 16.50
Alabama Car Wheel	18.25 @ 18.50
Jackson County Silvery	16.50 @ 17.00
Other Ohio Silvery	15.00 @ 15.50

Pittsburgh advices state that while stocks of Pig Iron at furnaces are large, the increased demand for Steel and the prospect of some business in Rails is expected to lead to a material lessening of stocks before this year is out. The uncertainty existing as to what price will have to be paid for Coke after December 31 next, on which date a good many contracts expire, is having the effect of making furnace operators unwilling to accept contracts for Iron for delivery very far into next year at present prices. Quotations are as follows:

No. 1 Foundry	$12.50 @ $13.00 Cash.
No. 2 Foundry	11.50 @ 12.00 "

A considerable increase in the volume of business in Pig Iron is indicated by Southern market reports. Yet there has not been the improvement in prices that was confidently expected. The sales aggregate upward of 50,000 tons, and were largely of No. 2 Soft, No. 3 Foundry and Gray Forge, on the basis of $8 ℔ ton, f.o.b. Birmingham, for No. 2 Foundry; $7.50, and in some instances $7.40, for No. 3 Foundry, and $7 ℔ ton for Gray Forge. The purchases were made by Iron Pipe works in the East, in the West and in the South, and are for deliveries running to next May. Other than these orders there has not been much business, but there is about the usual run of orders from the jobbing foundries, but Charcoal Iron is exceptionally dull, and there are free offerings of No. 2 Foundry. There continue to be fair deliveries on old contracts. Collections are reported as all that could be desired. Quotations are as follows:

Southern Coke, No. 1	$12.75 @ $13.00
Southern Coke, No. 2	10.75 @ 11.00
Southern Coke, No. 3	10.25 @ 10.50
Ohio Soft Stone Coal, No. 1	15.50 @ 16.00
Ohio Soft Stone Coal, No. 2	14.50 @ 14.75
Lake Superior Coke, No. 1	15.00 @ 15.25
Lake Superior Coke, No. 2	14.00 @ 14.25
Hanging Rock Charcoal, No. 1	18.50 @ 19.00
Hanging Rock Charcoal, No. 2	17.50 @ 18.00
Tennessee Charcoal, No. 1	14.00 @ 14.25
Tennessee Charcoal, No. 2	13.00 @ 13.25
Standard Southern Car Wheel	17.75 @ 18.00
Lake Superior Car Wheel and Malleable	17.00 @ 17.25

Metal Market.

Pig Tin.—The market has been characterized by depression during the greater portion of the week. Although no great amount of Tin came out, there proved to have been enough early in the week to force prices down to 20.30¢ @ 20.35¢ for prompt and immediate future delivery. Toward the close of the week, however, bids were raised to 20.50¢ for spot and November deliveries, and 20.60¢ for December. Speculative manipulation, it is alleged, played some part in the turn, as well as other transient factors. In any event the movement of prices is very perplexing to the general buyer, as also the fact that the range is lower at the present time than it was a year ago. The distribution by jobbers is reputed to have been on a very moderate scale, consumers adhering to a strictly conservative policy in their orders. Prices for small lots are rather weaker, and are quoted at 21½¢ @ 22¢ for Straits Pig, with ½¢

advance for Bars. Straits shipments during first half of November, as per Metal Exchange advices, were 1175 tons, including 700 tons to Great Britain and the United States and 475 tons to the Continent. Total shipments during the corresponding period last year were 1475 tons.

Copper.—Current report has it that the Calumet & Hecla Company have effected a large sale. No particulars were divulged as to the quantity of metal involved, as to the price paid or whether home consumers or exporters, or both, were the buyers. That there has been a deal is the fact, however, since the company referred to have refused subsequent orders for deliveries this year, while other producers have marked their price up to 10¢. Other descriptions are also held higher, or say 9¾¢ for Electrolytic and 9½¢ for ordinary casting stock, but the intimation was given in some quarters that desirable orders for the cheaper varieties would have been taken at some concession from those figures. The tone of the market is, however, firm. No startling improvement is noted in the jobbing movement of Copper, orders and inquiries continuing on a somewhat limited scale. Prices for small quantities remain unchanged at recent quotations.

Pig Lead.—The market is decidedly firmer, but at the higher range of prices there is hardly any buying on the part of home consumers. In other words, it looks very much like a speculative movement with the more aggressive operators well fortified. One strong point is that late low prices have checked production and prevented any serious accumulation of the metal at first hands, while operating to increase the consumption. Prompt and current month deliveries have been sold at 3.37½¢ @ 3.40¢. Speculative bids were made of as high as 3.42½¢ for December, 3.45¢ for January and 3.47½¢ for February delivery. The general consumptive demand continues to be of the slightest character, with no visible indication of any expansion in the near future. Prices for American Pig in small lots are quoted at 4¢ @ 4⅛¢.

Lead Pipe and Sheets.—Only a perfunctory movement is noted in the market for Manufactured Lead, and there is no reason to anticipate any material revival in the near future, the season being too far advanced for any general resumption of activity in the building trades. Much has been made by the daily press of a meeting of a committee from the Western Lead Pipe Association at New Haven, Conn., to confer with the local jobbers in respect to the maintenance of prices in Lead Pipe. It was alleged that a New Haven firm had obtained the whole output of a Western factory, and was flooding the market with it at a very large cut in the prices quoted by the association. The affair appears to have been grossly exaggerated and to have had little beyond a local and limited bearing. The Eastern prices for Lead Pipe and Sheets remain unchanged as per list.

Spelter.—None but ordinary sales on home account have been made in this quarter the past week, and the demand has continued slow. Such as they were, however, the orders were difficult to execute, since most replies from smelters virtually amounted to a refusal to sell for delivery during the next six weeks. The presumption is that the bulk of stock is in second hands. There were intimations of a "short" interest in the market. The nominal quotation at the close was 3.70¢ @ 3.75¢ for ordinary brands. Small lots of Western Spelter are usually offered at 4⅛¢ @ 4¼¢.

Tin Plate.—Orders for futures have dropped off to very moderate proportions, and buyers' views seem to have been moderated also. Spot business has not exceeded ordinary proportions, nor have ordinary out of town inquiries been up to the average. The market has, in fact, relapsed into a condition of dullness, relieved only by the usual hand to mouth business previously referred to. This kind of business is, however, likely to keep the market from stagnation while stocks in consumers' hands remain, as they are, practically nothing. Importations continue on a moderate scale. Prices are somewhat irregular, yet show no radical change. The undertone is, however, weaker, and concessions on quoted rates for desirable orders would not be as hard to obtain as was the case a week or two ago.

A special cable dispatch from London to *The Iron Age*, dated November 15, reports on the British market as follows: There has been no improvement in the Tin Plate market. From the Continent there is a little more inquiry, but as the expected demand from the United States was not realized buyers became reserved and purchased only as immediate orders required. Black Plate is scarce and £8. 5/ is now quoted at Swansea. Stocks at Swansea are now about 265,000 boxes. Liverpool quotations were as follows:

IC Charcoal, Alloway grade	12/6 @ 13/
IC Bessemer Steel, Coke finish	11/6 @ 11/9
IC Siemens " " "	11/9 @ 12/
IC Coke, B V. grade, 14 x 20	11/6 @ 11/9
Charcoal Terne, Dean grade	11/3 @ 11/6

CORDLEY & HAYES, 172 Duane street, New York, issue a circular under date of November 10, in which they state that their factory at Lockport, N. Y., which was destroyed by fire some time since, will be running again within two weeks, and with this increase of capacity they will be able in future to be more prompt in the filling of orders. It is intimated by the agents that they now have on their books orders for a large quantity of goods, which will be filled as nearly as possible in the order in which they were received.

Chicago Report.

Scrap.—A fair demand is experienced for all kinds of Old Material, except Steel, which is still neglected. Dealers furnish the following list of buying prices, Chicago delivery:

	Per net ton.	Per lb.
No. 1 Wrought Scrap	$7.00	....
Machinery Cast	7.00	....
Malleable Cast	6.00	....
Stove Plate (free of burnt)	5.00	....
Burnt Iron and Grate Bars	3.50	....
Sheet Iron and Hoops	2.00	....
Plow Steel and Breaking Stock	5.50	....
No. 2, such as Shovels, Hoes, &c	4.00	....
Old Boilers—whole (Iron)	4.00	....
" (Iron)—cut in single Sheets and Rings	6.00	....
Old Gas-Pipe and Boiler Tubes	5.00	....
Cast Borings	3.25	....
Turnings	4.00	....
Horseshoes	8.00	....
Copper Bottoms	....	5 ¢
Copper Clips and Heavy	....	7 ¢
Heavy Brass	....	5½¢
Light Brass	....	3½¢
Pipe Lead	....	2½¢
Tea Lead	....	2 ¢
Zinc	....	2 ¢
Rubber	....	4 ¢

Anthracite.—Trade has been light for the past week, but with the advent of colder weather is expected to improve speedily. Carload lots of 12 net tons or over are quoted as follows:

	Grate.	Egg, Sto. and Ch.
Chicago, Ill	$5.85	$6.10
Milwaukee, Wis	5.85	6.10
Kansas City, Mo	9.05	9.30
Council Bluffs, Iowa	9.05	9.30
Lincoln, Neb	9.20	9.45
Sioux City, Iowa	9.05	9.30
Aberdeen, S. Dak	9.10	9.35
Dubuque, Iowa	7.15	7.40
Madison, Wis	7.35	7.60
St. Paul, Minn	8.35	8.60
Burlington, Iowa	7.35	7.60
Des Moines, Iowa	8.80	9.05
Davenport, Iowa	7.15	7.40
St. Joseph, Mo	9.05	9.30
Leavenworth, Kan	9.05	9.30
Omaha, Neb	9.05	9.30

Colorado Anthracite.

COLORADO FUEL & IRON COMPANY.

Denver	$8.00
Pueblo	8.00
Colorado Springs	8.00
Leadville	8.00
Cheyenne, Wyo	10.00
All points between Denver and Missouri River	8.85

ON THE NIGHT of October 31 the plant of the Irondale Steel & Iron Company, at Anderson, Ind., was entirely destroyed by fire, which is supposed to have originated in the oil house. The works, consisting of two sheet mills and a puddle mill, with the necessary bar rolling capacity, were in full operation at the time, but as the buildings were almost entirely constructed of wood, which was very old and dry, the fire was of brief duration. With the exception of some new parts added last spring, the plant consisted of buildings and machinery which had passed through the hands of various owners, having been moved from Aurora, Ind., several years ago. The loss was about $40,000, partly covered by insurance. It is probable that the company will rebuild at a nearby point and take advantage of an abundant supply of natural gas in the territory under consideration. This unfortunate circumstance takes 20 tons of sheets per day out of the market at a time when orders are becoming more plentiful, and throws about 150 men out of employment.

CONDITION OF THE

Hardware Trade.

THE TENOR of recent reports from the trade shows something of an improvement in feeling, indicating that a more confident tone is prevailing, with, perhaps, an increase in the volume of business. Orders are referred to as more frequent, but for small quantities, indicating that stocks throughout the country are exceptionally limited and that purchasers are adhering to the conservative policy which has governed them for some time. Collections also are better, and little complaint is now made on this score. Another favorable indication is in the fact that the large trade are placing orders for next season, the size of which suggests the expectation of at least an average trade. Prices are without special change, most lines being held pretty firmly, but with the low prices ruling for the raw material and the low quotations current for some staple goods, the tone of the market is not strong, and it is not unlikely that prices in the future on some lines will be lower. The result is probable if, as seems not unlikely, a reduction in wages is made. Manufacturers are certainly scrutinizing their costs very closely, effecting economies wherever possible, and the question as to wages is receiving consideration. Both manufacturers and merchants are thus pursuing a conservative course, but it is pleasant to note the better feeling in mercantile and manufacturing circles and the continuance of a steady if not a large business.

Advices from Chicago.—A better demand has been experienced within the past two or three days for seasonable goods, caused, of course, by the change to colder weather throughout the Northwest. In other respects the trade in Shelf Hardware is about as previously reported, but there is some encouragement in the fact that the trade seems to be going along steadily, and not decreasing in volume. There may be a slight shading on prices here and there by jobbers with large stocks, but the movement is not by any means general, and prices may be said to be well maintained considering the circumstances. Heavy Hardware is doing considerably better this month. Sales so far are about double what they were during the corresponding period of last month. The movement is principally in Iron and Steel, but the demand for season goods is improving, and cold weather will probably make it much more active. Competition on staple goods in Heavy Hardware is getting a little keener and some shading is being done, in which, however, all the jobbing houses are not participating.

Notes on Prices.

Wire Nails.—The past week has brought but little change in the market for Wire Nails. Prices remain on about the same level as for the past few weeks and are apparently not any firmer, quotations being on a basis of $1.20 to $1.25 for carload lots at mill, and it is intimated that the former figure is given a little more freely than it has been, so that on good orders it about represents the market. While thus in the matter of price there is no improvement, the volume of business has somewhat increased, and a good many houses have been taking advantage of the low prices ruling and have been purchasing more freely than for some time past. As a result the mills are quite well supplied with orders. The desire to have goods shipped before the close of navigation has something to do with purchases, and the improved financial condition is also having a perceptible influence on trade in this line. Small lots from store are quoted in the New York market at $1.60 to $1.65.

Advices from Chicago.—A remarkable change is perceptible in the tone of the Wire Nail trade. Manufacturers' agents report their books well filled with orders and specifications coming in freely. Orders for 1000 keg lots have been decidedly more numerous of late. The condition of this trade is much better now, so far as the volume of business is concerned, than at any time for the past month. Quotations are maintained at $1.30 to $1.32½, Chicago, for factory lots. Jobbers quote $1.45 to $1.55 for small lots from stock.

Cut Nails.—A moderate volume of business is reported by the manufacturers. The trade are not purchashing with much freedom and the market on the whole is sluggish. Prices are represented by the quotation of 95 cents for carload lots at mill. Five cents more is sometimes asked, but, on the other hand, attractive orders can be placed at 90 cents. The New York price for small lots from store is about $1.20.

Advices from Chicago.—Business in Cut Steel Nails keeps up very well also. The trade with Southwestern points continues to be a good feature of current business. Prices are fairly steady at $1.20, Chicago, for factory lots, the only variation from the base price being made in case of particularly good specifications. Small lots are selling from stock at $1.30.

Barb Wire.—Barb Wire continues to move in moderate quantities and at the somewhat irregular prices which have been ruling for the past few weeks. Manufacturers are evidently desirous to secure such orders as are going and the market is decidedly in the buyers' favor. We continue to quote $2.15 for carload lots of Four-Point Galvanized at mill as fairly representing the market, but concessions are made with more or less freedom.

Advices from Chicago.—Trade has improved considerably in Barb Wire. Jobbers in the Northwest are beginning to inquire as to prices and terms on spring shipments, and those who have bought for delivery after January 1 are in some cases ordering shipments to begin now, as they are out of Wire. Prices are not so low here as reported in other sections of the country, carload lots being quoted $2.40 for Galvanized Barb Wire, and small lots from stock at $2.55.

Standard Watering Pot.—The Standard Watering Pot, manufactured by Engelhart & Co., Glenville, Ohio, which was described in a recent issue, is sold from the following list, which is subject to a discount of 33⅓ per cent.:

Quarts	8	10	12	14	16
Each	$1.25	1.35	1.50	1.75	2.00

Bread, Cake and Paring Knives.—The Clauss Shear Company, Fremont, Ohio, and 100 Chambers street, New York, issue a revised net price-list of the Clauss Bread, Cake and Paring Knives and Perfect Carver, as follows:

	Per dozen.
Set A, consisting of Bread, Cake and Paring Knives	$6.00
Set B, consisting of Bread and Paring Knives and Perfect Carver	6.00
Bread Knife	3.00
Cake Knife	2.00
Paring Knife	.00
Perfect Carver	3.00

Glass.—Window Glass houses continue to go into operation, one by one, and probably a large proportion of the entire number will be making Glass by the end of this month. It is not anticipated that the amount of Glass manufactured will be allowed to be much in excess of the demand. The Glass business may be said to compare favorably with other lines, although prices are unsettled. There is no basis for official quotations, as each maker or jobber is getting what he can. A Cleveland jobbing house quotes Single and Double Glass, by the box, at 80 and 20 per cent. discount, f.o.b. Cleveland, or in 25-box lots, 80 and 20 per cent. discount, freight allowed. Some of the Plate Glass works are starting up, the open weather having been favorable for building, and the demand, though not large, shows no signs of falling off, nor have prices advanced.

Old Metals.—The market for Old Metals, other than Iron, shows no sign of improvement. The demand is light and supplies abundant. Scrap Iron is in rather better demand in some quarters, but prices are not yet on the up grade. They are so low that in many cases small producers state that it does not pay them to gather it up and ship it to market. The following quotations show the prices now ruling in New York:

Heavy Copper	₩ lb 6¾¢
Light and Tinned Copper	₩ lb 6¼¢
Heavy Brass	₩ lb 5¼¢
Light Brass	₩ lb 4⅛¢
Lead	₩ lb 3¢
Tea Lead	₩ lb 2½¢
Zinc	₩ lb 2½¢
No. 1 Pewter	₩ lb 14¢
No. 2 Pewter	₩ lb 6¢
Wrought Scrap Iron ₩ gross ton	$9.00 @ $10.00
Heavy Cast Scrap ₩ gross ton	9.00 @ 10.00
Stove Plate Scrap ₩ gross ton	.... @ 5.60
Burnt Iron (delivered at mill) ₩ gross ton	.... @ 5.00

Old Rags, Paper, &c.—But little improvement is noted in the market for these materials. Paper mills are still purchasing in a conservative manner, but a turn for the better is hoped for within the next few weeks. Meanwhile New York prices rule about as follows:

No. 1 White Rags	℔	3¼ @	3½
No. 2 White Rags	℔	2¼ @	2⅜¢
Mixed Rags	℔		2¼¢
Blues and 3ds	℔	1 @	1¼¢
Hard Sized White Shavings	℔	2¼ @	2⅜¢
No. 1 White Book Shavings	℔	2 @	2⅛¢
No. 2 White Book Shavings	℔	1 @	1⅛¢
Light Book Shavings	℔		¾¢
No. 1 Mixed Shavings	℔	¾ @	1 ¢
No. 2 Mixed Shavings	℔	½ @	¾¢
No. 1 Printed Books	℔	1 @	1¼¢
Ordinary Mixed Books	℔	⅛ @	¾¢
Newspapers	℔		3-5¢
No. 1 Manila Paper	℔	⅞ @	1 ¢
No. 2 Manila Paper	℔	⅝ @	¾¢
Bogus Paper	℔		⅛¢
Common Paper	℔	¾ @	⅛¢
Straw Chips	℔	⅛ @	3/16¢
Binders' Clippings	℔	½ @	⅝¢
Jute Butts	℔	1½ @	1¾¢
No. 1 Jute Bagging	℔	1 @	1¼¢
Mixed Bagging	℔	¾ @	1 ¢
No. 2 Bagging	℔	½ @	¾¢
Hemp Twine	℔		2¼¢
Manila Rope	℔		2½¢
Jute Rope	℔	1½ @	1¾¢
Mixed Rope	℔	¾ @	⅞¢

Old Rubber.—Nothing worthy of note is being done in this material. Prices continue low, being about as follows for New York delivery:

Car Springs, ton lots, ℔	@	$0.03¼
Rubber Shoes, carloads, delivered at factory, ℔	@	.03
Rubber shoes, less than carloads, ℔	@	.03⅛
Large Hose, ℔ ton	@	9.00
White Wringer Rolls, ℔	@	.04¼
White Syringes, ℔	@	.05

Trade Notes.

I. P. FRINK, 551 Pearl street, New York City, is in receipt of a very flattering testimonial from Rev. Richard Hartley of the Hope Baptist Church, New York, in which he refers to the very satisfactory results obtained from the use of two Frink Reflectors, and is of the opinion that the lighting of a building from a central Reflector is superior to any other method.

THE GRISWOLD MFG. COMPANY of Erie, Pa., received from the World's Fair five awards on their complete line of Hollow Ware, American Waffle Irons, American Dampers, &c.

THE FACTORY of the Grand Rapids Refrigerator Company, Grand Rapids, Mich., manufacturers of the Leonard Cleanable Refrigerators, is running full time and force. The company advise us that they have been awarded three medals and a diploma at the World's Fair on the excellence of their goods. Their new catalogue is now in preparation and will soon be distributed to the trade. It is stated that many new designs and improvements have been added for the coming season.

THE TIN AND STAMPING WORKS of the Thos. McDonald Mfg. Company, at Montreal, P. Q., have been burned. The loss is $50,000, covered by an insurance of $27,000.

ATTENTION IS CALLED to the full page advertisement of the Ringen Stove Company, St. Louis, Mo., which appears in another part of the paper. A review of the sales of this concern will prove interesting. In 1882 they sold 876 stoves, in 1884 they disposed of 8997, being over ten times as many as in 1882 In 1887 their sales amounted to 20,317, which were more than twice as many as in 1884 Again in 1891 we find them selling 36,242 stoves, which is almost twice as many as sold in 1887, and in the present year their sales foot up 71,316. With their increased facilities they will be in position to sell 100,000 stoves during 1894.

THE MICA MFG. COMPANY, 89 Fulton street, New York are placing on the market a variety of new and useful articles, such as Canopies for gas globes, made with an adjustable holder and which can be readily applied to any style of globe. They also are making Mica for magic lanterns, and Mica Protectors and Screens. Also a very useful article, a Mica Protector for silk shades. This corporation was established in 1884 Since that time their trade has steadily increased. They also make goods for electric purposes, as well as assorted Mica in pound packages for the stove trade.

THE AMERICAN WIRE GLASS COMPANY'S works, at Tacony, near Philadelphia, started into full operation on Monday, after some weeks of stoppage. Over 100 men, mostly skilled workmen, are employed.

SHEPARD HARDWARE COMPANY Buffalo, N. Y., issue three circulars, which they are sending out, offering for sale metal patterns of any goods formerly made by them, second hand machinery, also a considerable number of Floor Flasks for foundry use. Included in second hand machinery, fixtures, &c., are Boilers, Steam Pump, Blowers, Riveting Machine, Fire Extinguishers, Ladle Shanks, Japan Ovens, Office Furniture, Fixtures, &c. Metal Patterns include those of Blind and Shutter Hinges, Gate Hinges and Latches, Dampers, Presses, Toy Banks, Stove Lid Lifters, Sausage Stuffer, Coffee Pot Stands, Boiler Handles, Iron Toys, &c. Any inquiries regarding these articles will be cheerfully answered by the company.

The 9585 men who enlisted in the United States army last year represented some 200 different trades or occupations, including lawyers, doctors, chemists, school teachers, civil engineers and others from the educated professions. The large majority, however, were drawn from the laboring and mechanical occupations.

The Toledo, Ohio, Manual Training School has opened for the season with an enrollment of 300 pupils. George S. Waite, a former pupil and instructor at the school, has taken charge as superintendent, in succession to Superintendent Mills, resigned. Mr. Waite is said to be an enthusiastic advocate of manual training, to which he has devoted close study.

A general depression exists in insurance circles in this country, and many very unsatisfactory statements are looked for in January. Experts assert that the fire underwriting outlook is far from cheerful.

The death is announced at Union City, Mich., of John Palmer, the man who invented the baggage checking system, from which, however, he received not a cent of profit.

The dry goods trade has figured prominently in recent notices of failures and embarrassments.

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CHICAGO, NOVEMBER 16, 1893.

Tin—

Straits pigs.....23¢

Imported Tin Plates—

Charcoal Plates.—Bright.

Guaranteed Plates command special prices, according to quality.

		Per box.
Celland and Melyn Grade	IC, 10 x 14	@ $6.75
	IC, 12 x 12	@ 6.75
	IC, 14 x 20	@ 6.75
	IC, 20 x 28	@ 13.50
	IX, 10 x 14	@ 8.75
	IX, 12 x 12	@ 8.75
	IX, 14 x 20	@ 8.75
	IX, 20 x 28	@ 17.50
	DC, 12½ x 17	@ 6.50
	DX, 12½ x 17	@ 8.50
Allaway Grade	IC, 10 x 14	@ 6.50
"	IC, 12 x 12	@ 6.50
"	IC, 14 x 20	@ 6.50
"	IC, 20 x 28	@ 13.00
"	IX, 14 x 20	@ 8.00
"	IX, 20 x 28	@ 16.00

Coke Plates—Bright.

	Per box.
Steel Coke—IC, 10x14.14x20.	$5.75 @ $5.85
IC, 14x20.90 ℔	5.50 @ 5.60
IC, 14x20, 100 ℔	@ 5.85
10 x 20	8.75 @ 9.00
20 x 28	11.50 @ 12.70
X, 10x14, 14 x 20	@ 7.35
B.V. Grade. IC, 10x14, 14x20.	5.85 @ 6.00

Charcoal Plates.—Terne.

Guaranteed Plates command special prices, according to quality.

Mansel and Dean Grades.—	
IC. 14 x 20	@ $5.62½
20 x 28	@ 11.25
IX. 20 x 28	@ 14.25
Worcester Brand and equal.—	
IC, 14 x 20	6.12½@ .....
IC, 20 x 28	12.25 @ .....
IX, 14 x 20	7.62½@ .....
20 x 28	15.25 @ .....

American Tin Plates.

Charcoal Plates.—Bright.

Irondale, A, A.—IC, 14 x 20	$7.00
" " IX, 14 x 20	9.00
" " IXX, 14 x 20	11.00
" " IC, 20 x 28	14.00
" " IX, 20 x 28	18.00
" " IXX, 20 x 28	22 00
Florence.—	
IC, 10 x 14, 12 x 12, 14 x 20	6.75
IX, 10 x 14, 12 x 12, 14 x 20	8.50
Palma.—	
IC, 10 x 14, 12 x 12, 14 x 20	7.25
IX, 10 x 14, 12 x 12, 14 x 20	9.25

Each extra cross $2.00 and 20 x 28 double these prices.

Brilliant, Tissue Packed, IC, 14 x 20.	$9.25
Royal ,extra, IC, 14 x 20	7.25
Merion, IC, 14 x 20	7.00
Almond, IC, 14 x 20	6.50
Mint, IC, 14 x 20	6.25

Coke Plates.—Bright.

Elwood.—IC, 14 x 20	$6.00
" IC, 20 x 28	12.50

Roofing Plates.

Arch, IC, 20 x 28	@ $11.75
Crescent, IC, 20 x 28	@ 12.25
Crescent, IX, 20 x 28	@ 15.25
Empire, IC, 20 x 28	@ 12.50
Empire, IX, 20 x 28	@ 15.50
Hickory, IC, 20 x 28	@ 12.75
" IX, 20 x 28	@ 15.75
Alaska (heavily coated), IC, 20x28	@ $14.50
Alaska IX, 20 x 28	@ 17.75
Special, IC, 20 x 28	@ 15.50
" IX, 20 x 28	@ 18.50
Merchant's Roofing (extra coated), IC, 20 x 28	@ $17.75
Merchant's Roofing (extra coated), IX, 20 x 28	@ $21.50
Merchant's Old Method, (extra heavily coated), IC, 20 x 28	@ $19.75
Merchant's Old Method (extra heavily coated), IX, 20 x 28	$23.60
Irondale A:	
IC, 14 x 20	$6.25
IX, 14 x 20	7.75
IC, 20 x 28	12.50
IX, 20 x 28	15.50
Westmoreland:	
IC, 14 x 20	$6.25
IC, 20 x 28	12.50
Elwood:	
IC, 20 x 28	$12.00
Juno:	
IC, 14 x 20	$5.75
IC, 20 x 28	11.50
Illinois, Old Method:	
IC, 20 x 28	$17.00
E. L.:	
IC, 20 x 28	$12.50
Jessie:	
IC, 20 x 28	$12.00
Scott's Extra Coated, Stamped and Resquared, IC, 14 x 20	$9.50
Scott's Extra Coated, Stamped and Resquared, IX, 14 x 20	11.00
Scott's Extra Coated, Stamped and Resquared, IC, 20 x 28	19.00
Scott's Extra Coated, Stamped and Resquared, IX, 20 x 28	22.00
Neville, Stamped, IC, 14 x 20	6.25
" " IX, 14 x 20	7.50
" " IC, 20 x 28	12.50
" " IX, 20 x 28	15.00
Taylor's Old Style, IC, 14 x 20 (Stamped and Resquared)	$9.50
Taylor's Old Style, IC, 20 x 28 (Stamped and Resquared)	19.00
Taylor's Roofing, IC, 14 x 20 (Stamped and Resquared)	8.25
Taylor's Roofing, IC, 20 x 28 (Stamped and Resquared)	16.50
Columbia, IC, 14 x 20 (Stamped)	7.25
" IC, 20 x 28 (Stamped)	14.50
Maple, IC, 14 x 20 (Stamped)	6.75
" IC, 20 x 28 (Stamped)	13.50
Willow, IC, 14 x 20	6.50
" IC, 20 x 28	13.00
Knoxall, IC, 14 x 20	6.25
" IC, 20 x 28	12.50
Globe, IC, 14 x 20	6.00
" IC, 20 x 28	12.00
Miami, IC, 14 x 20	6.00
" IC, 20 x 28	12.00
" IX, 20 x 28	15.00
" (Redipped), IC, 20 x 28	17.00

Tin Boiler Plates.

	Per box of 100 sheets.	Per box of 112 sheets.
X, 14 x 28	$13.00	$13.00
XX, 14 x 28	14.50	14.50
X, 14 x 31	14.50	15.80
XX, 14 x 31	16.50	17.50

	Per box of 56 sheets.	
X, 14 x 56	29.50	16.50
XX, 14 x 56	32.50	18.20
X, 14 x 60	31.50	17.65
XX, 14 x 60	35.50	20.90

Sheet Iron—

Black.

	Common American	Refined.
Nos. 10 to 16	℔ 2 6-10¢	3 2-10¢
17 to 20	℔ 2 7-10¢	3 3-10¢
21 to 24	℔ 2 8-10¢	3 4-10¢
25 and 26	℔ 2 9-10¢	3 5-10¢
27	℔ 3¢	3 6-10¢

Russia, Planished, &c.

Genuine Russia, all numbers....13¢ net.
Patent Planished....℔ ℔ A, 10½¢; B, 9½¢ dis. 5%
Craig's Polished Sheet Steel.....8½¢

Galvanized.

Juniata or first quality.....dis. 70&5%

Copper—

Ingot.

Lake.....11¾¢ @ 12¼¢
Casting Brands.....11¢ @ 11½¢

Sheet and Bolt.

Discount, 25%.

Copper Bottoms.

Discount, 25%.

Seamless Brass and Copper Tubes.

Base price, 17½¢, Chicago, with extras according to size.

Copper, Bronze and Gilding Tube, 3¢ ℔ additional.

Brazed Brass Tubing.
(To No. 20 inclusive.)

Add freight from New York to Chicago to these prices, or 50¢ ℔ 100 ℔.

Above 5-16 inch to 3 inch inclu...	35¢
Plain, above 3 inch	45¢
Plain, 5-16 inch	45¢
Plain, ¼ inch	60¢
Plain, 3-16 inch	$1.00
Plain, ⅛ inch	$1.50
Fancy Tubing, Brass, to No. 20 incl	43¢ ℔
Bronze Tubing, 3¢ ℔ more than Brass	

40 @ 45 %

Roll and Sheet Brass.

Discount, 35 @ 40%.

Slab Spelter—

Western Spelter.....5

Sheet Zinc—

600 ℔ casks.....5 ¢
300 ℔ casks.....5¼¢
Loose sheets.....5½¢

Lead—

Soft Pig Lead.....4¢
Bar.....4½¢
Pipe.....5½¢, dis. 10¢
Block Tin Pipe.....35¢
Sheet.....6¢, dis. 10%

Solder—

½&½.....12¾¢@13¼¢
Extra Wiping.....11½¢

The prices of the many other qualities of Solder in the market indicated by private brands vary according to composition.

Antimony—

Cookson.....12¢@12½¢
Hallett's.....11¼¢@11¾¢

Wrought-Iron Pipe—

List on following page.

1¼ and under, Plain	57½&10%
1¼ and under, Galv	50½&10%
1½ and over, Plain	67½&10%
1½ and over, Galv	57½&10%
Boiler Tubes, list Oct. 24, 1892	65@67½%
Casing, list Nov. 16, 1892	52½%
Inserted Joints Casing, list Nov. 16, 1892	47½%
Steel Boiler Tubes	27½%
Cold Drawn Seamless Steel Tubing	50%

Cast-Iron Soil Pipe—

Cast-Iron Soil-Pipe, Tarred; sizes 2 to 6 inches, inclusive	dis 70&2½%
Other sizes	dis 60%

Leader Pipes—

Abendroth's Galv. Spiral Riveted	60%
Austin's Corrugated	60%
Gordon & Gilbert's Corrugated	60%
Ritchie's (Galv. Iron only) Cor'd	60%
Ritchie's Spiral Lock Seam, Galv'd	55%
Austin's Spiral Ribbed Pipe	60%
Plain Adjustable Elbows	60%
James A. Miller Bros. (Galv'd Iron only) Corrugated	60%

Furnace Fittings—

Discount from Excelsior Steel Furnace Co.'s list.....50%

Steel Roofing—

Perfection	$3.75 square
Climax	$3.50 square
The Lloyd Spanish Tiling	$4.50 square

Metallic Shingles—

Cushman's	$1.25 square
Merchant & Co.'s Spanish Tiles:	
Copper, 14 oz	$36.00 square
Tin	$9.75@$14.25 square
Steel, painted	$9.00 square

Drain Pipe—*Tile.*

Discount from list.....70%

Paints, Oils, &c.—

Deodorized Benzine	7½@8 ¢
Iron Paint, Bright Red	℔ D, 2 ¢
" " Brown	℔ D, 1¾¢
" " Purple	℔ D, 2½¢
" Ground in oil, B. Red	℔ D, 6¼¢
" Ground in oil, Red	℔ D, 6¼¢
" Ground in oil, Brown	℔ D, 5½¢
" Ground in oil, Purple	℔ D, 6 ¢
Linseed Oil, Boiled, in bbls	40¢
Linseed Oil, Raw, in bbls	37¢
Mineral Paints	2@4¢
Orange Mineral	10¾¢
Pure White Lead in Oil	6¾@7¼¢
Dry White Lead in bbls	6¼@6¾¢
Red Lead, American	7@7½¢
Red Venetian, English, dry	$1.65@$1.70
Red Venetian in oil; asst'd cans, 8¼¢; kegs	7½¢
Sipe's Japan Oil, in bbls, ℔ gal	34¢
Spirits Turpentine, in bbls., ℔ gal	35¼¢
Asphaltum, Trinidad Refined, ℔ ton	$45
Tarred Felt, 1 Ply, ℔ 100 ℔	$1.60
Tarred Felt, 2 Ply, ℔ roll 108 sq. feet	$1.25
Tarred Felt, 3 Ply, ℔ roll of 108 sq. feet	$1.70
Roofing Pitch, ℔ bbl. of 300 ℔	$3.00

NEW YORK, NOVEMBER 17, 1893.

The following quotations are for small lots.

Aluminum—

No. 2 Grade Metal, in ton lots..℔ D, $0.75
No. 1 (guaranteed to be 98 % pure and over), in ton lots .....℔ D .90
Lots less than 1 ton, 10¢ ℔ ℔ additional.

Antimony—

Cookson.....℔ D, 11¢
Hallett's.....℔ D, 10¼¢@10½¢

Brass—

Planished.....net
Roll and Sheet.....35@40%

Brass and Copper Tubes
Brazed Brass Tubing—

List May 20, 1889.

	Per D.	
Plain, to No. 20 inclusive, above 5-16 inch to 3 inch inclusive	$0.35	35@40%
Plain, to No. 20, above 3 inch	45	
Plain, 5-16 inch to No. 20	45	
Plain, ¼ inch	60	
Plain, 3-16 inch	1.00	
Plain, ⅛ inch	1.50	
Fancy Tubing to No. 20, inclu	43	

Copper and Bronze Tubing—

3¢ ℔ ℔ more than brass.

Bronze, Tobin—

Drawn Rods for Bolts, Forgings, &c

Over ¼ to 3½ inches inclusive....17¢ ℔ D
Over 3½ to 5 inches inclusive....18¢ ℔ D

Piston Rods, Finished True, Smooth and Straight.

Over ¼ to 3½ inches inclusive....18¢ ℔ D
Over 3½ to 5 inches inclusive....19¢ ℔ D

Clips—

Buffalo Damper: Nos. 1, $1.25; 2, 2.50 per doz.....40&10%

Conductors—

Corrugated. *Round or Square—*

Galvanized.....60%
Galvanized, Locked Joints.....60%
Tin.....60%

Spiral Riveted—

Galvanized.....50%

See also *Elbows and Shoes; Eave-Trough Miters; Strainers, Conductor.*

Conductor Strainers—See *Strainers, Conductor.*

Copper—

Bottoms, Pits and Flats....25@25&5%

Ingot.

Lake.....11¢
Ansonia Grade Arizona.....10½¢
Ansonia Grade Casting.....10¢

Planished......net

Sheet and Bolt.....25&25&5%

Tubes—See *Seamless Brass Tubes.*

Coppers, Soldering—

See *Irons, Soldering,* in Current Hardware Prices.

Damper Clips Buffalo—

See Clips, Buffalo Damper.

Eave Troughs—

Lap or Slip Joint, Galvanized.....60&10%
Lap or Slip Joint Terne.....60%

Eave-Trough Mitres—

Lap or Slip Joint.....list, net

Elbows—

Plain Adjustable—

Tin.....70%
Galvanized.....70%

Crimped Tubing—

Re-Tinned or Galvanized.....35%

Stove-Pipe—

Buffalo Four-Piece.

4½	5	5½	6	7 inch,
$0.78	.87	.90	.99	1.20 per doz.

..20 %

Elbows and Shoes—

Flat Crimp.

Tin.....35%
Galvanized.....55%

Corrugated.
Flat Crimp.

Galvanized.....60%

Round or Square.

Tin.....60%
Galvanized.....60%

Iron, Sheet—

Black.

	Common American.	R. G. Cleaned American.
Nos. 10 to 16	℔ D, 2¾	3.10¢
Nos. 17 to 20	℔ D, 2.85	3.10¢
Nos. 21 to 24	℔ D, 2.90	3.20¢
Nos. 25 and 26	℔ D, 3.05	3.30¢
No. 27	℔ D, 3.15	3.40¢
No. 28	℔ D, 3¼	3½¢
American B. B.	℔ D, 4¢@4½¢	

Russia, Planished, &c.

Genuine Russia, according to assortment.....℔ D, 11¾@12½¢
Patent Planished....℔ D, A, 10¢; B, 9¢, 5%
Craig Polished Sheet Steel.....℔ D, 8½¢

Galvanized.

	B. B.	
Nos. 10 to 16		70&2½&10%
Nos. 17 to 22		
Nos. 23 to 24		
Nos. 25 to 26		
No. 27		
No. 28		
Nos. 29 and 30		

Filter Joints—

Lee's.....33⅓

Lead—

American Pig	4¢@4½¢
Bar	4½¢
Pipe	6½¢, 20%
Tin Lined Pipe	16¢, 20%
Block Tin Pipe	37½¢, 20%
Sheet	7¢, 20%

Old Lead in exchange, 3½¢ ℔ D.

Metal Expanded—

Manufacturers' list No. 5.

Lathing	10%
Fencing, Painted Sheets	20%
Netting, Painted Sheets	20%
Door Mats, Galvanized	25%
Window Guards, Paneled	15%
Tree Guards, Paneled	15%

Mitres Eave-Trough—See *Eave-Trough Mitres.*

Paints Oils &c.—

Lead, Amn. White, in oil	6¾ @ 7¼
Lead, Red, bbls. and ½ bbls	6½ @ 7
Lead, Red, kegs	6½ @ 7
Ocher, American	1 @ 1½
Red, Venetian, American	1½ @ 2½

Linseed Oil:
Raw, ₩ gal..... @ .40
Boiled..... @ .43
Spirits Turpentine:
In bbls..... @ .32
Putty:
In barrels and ½ bbls..... .01⅜ @ .01¾
In tubs..... .01⅝ @ .01¾
In tin cans..... .01½ @ .02⅛
In bladders..... .01⅜ @ .02¼
Roofing Material, &c.:
Asphaltum, Trinidad Refined, ₩ ton..... $30.00@$35.00
Asphaltum, Rock, ₩ ton..... $14.00
Coal Tar Felt, 1 Ply, ₩ ℔..... 2¢
Coal Tar Felt, 2 Ply, ₩ roll 108 sq. ft. $1.42½
Coal Tar Felt, 3 Ply, ₩ roll 108 sq. ft. $1.85
Roofing Pitch, ₩ bbl..... $2.25

Pipe, Drain 50%

Pipe and Fittings, Cast Iron Soil—

Cast-Iron Soil Pipe, Tarred, sizes 2 to 6 Inches, inclusive..... 60@60&10%
Other sizes..... 55@55&10%
Cast-Iron Fittings, Tarred, sizes 2 to 6 inches..... 60@60&10%
Other sizes..... 55@55&10%

Pipe, Spiral—

Galvanized..... 60%
Tin..... 60%

Rock and Slag Wool—

	₩ ℔	₩ cub. foot
Slag Wool, ordinary	1¼	15¢
Slag Wool, extra	4¼	38½¢
Rock Wool, ordinary	2¼	27¢
Rock Wool, extra	7¼	43½¢

Rosin—

Common and Good—Strained,
Rosin, C. & D..... ₩ bbl. $1.20@$1.30
Rosin, E. & F..... ₩ bbl. $1.50@$1.55
Rosin, G. & H..... ₩ bbl. $1.60@$1.85
Rosin, I. & K..... ₩ bbl. $2.15@$2.60
Rosin, M. & N..... ₩ bbl $3.05@$3.85

Seamless Brass Tubes..net

Shoes and Elbows—See *Elbows and Shoes.*

Slate Roofing—

According to size, f.o.b. cars, Quarry Station.

Pennsylvania:
Best Bangor, ₩ sqr..... $3.25@$4.50
Pen Argyle, ₩ sqr..... 3.50@ 4.25
Peach Bottom, ₩ sqr..... 5.00@ 6.25
No. 1 Chapman, ₩ sqr..... 4.00@ 4.65
Lehigh Slates, ₩ sqr..... 3.00@ 4.50
Vermont:
Sea Green, ₩ sqr..... 2.70@ 3.20
Purple, ₩ sqr..... 3.50@ 4.50
Unfading Green, ₩ sqr..... 3.50@ 4.00
Red, ₩ sqr..... 9.75@12.00

Solder and Soldering Fluids—

Solder—

½ & ½..... 13½@14½¢
No. 1..... 11¾@12 ¢
Prices of Solder indicated by private brands vary according to composition.

Soldering Fluids—

Concentrated Soldering Flux.
f.o.b. New York.
In barrels, ₩ ℔..... 4¢
Smaller quantities, ₩ ℔..... 5¢

Gedney's Soldering Fluid.
In carboys or barrels, ₩ ℔..... 2¢
$1.50 for carboy or barrel; money refunded when returned.

Perfection Soldering Flux.
No charge for package.
Bbls., about 500 ℔, ₩ ℔..... 3½¢
½ bbls., about 300 ℔, ₩ ℔..... 4¢
Kegs, about 110 ℔, ₩ ℔..... 4¢
75¢ extra for keg. } 5% dis.
Kegs, about 55 ℔, ₩ ℔..... 4¢

Yager's Soldering Salts.
¼ ℔ bottles, each..... 30¢
Large quantities, per ℔..... 40¢

Spelter—

Western Spelter..... 4½¢@4¾¢
Bertha..... 8¼¢@9¢

Spiral Pipe—See *Pipe, Spiral.*

Stove-Pipe Elbows—*See Elbows, Stove Pipe.*

Stove Polish—See *Polish, Stove.*

Stove Trucks—See *Trucks, Stove.*

Strainers Conductor—

Galvanized..... 60%

Tin, Pigs and Bars—

Banca, pigs, ₩ ℔..... 22½¢
Straits, pigs, ₩ ℔..... 21½¢@22¢
Straits in bars, ₩ ℔..... 22½¢@23¢

Tin Plates—

American Terne Plates—

Alaska (re-squared) IC, 14 x 20.... $7.00
Alderly, extra quality, IC, 14 x 20..6.37½
Allegheny, IC, 14 x 20..... 6.12
" " IX, 14 x 20..... 6.38
Apollo Roofing, IC, 14 x 20..... 6.25
" " " IX, 14 x 20..... 7.25
Bonus, Extra Coated, IC, 14 x 20.... 6.75
" " " IX, 14 x 20.... 8.25
Buckeye, IC, 14 x 20..... 7.00
" " IX, 14 x 20..... 8.25
Chicago, IC, 20 x 28..... 11.50
Central, IC, 14 x 20..... 5.37½
Climax, IC, 14 x 20..... 5.70
Columbia, IC, 14 x 20..... 7.00
Crescent, IC, 14 x 20..... 6.00
DeMilt's First New York, IC, 14 x 20. 5.75
" First New Jersey, IC, 14 x 20 5.50
" Mohawk, IC, 14 x 20..... 5.50
Dunlap's Double Dipped, IC, 14 x 20 8.25
" " IX, 14 x 20 9.50
" Domestic, IC, 20 x 28.....12.00
" " IX, 20 x 28..... 15.00
Empire, IC, 14 x 20..... 6.12½
Extra Central, IC, 14 x 20..... 5.62½
Flag, IC, 14 x 20..... 5.50
Fort Pitt, IC, 20 x 28..... 11.00
Globe, IC, 14 x 20..... 5.75
Hamilton's Best Redipped, IC, 14x20 9.25
" " " IX, 14x20 10.75
Hickory (Resquared), IC, 14 x 20..6.37½
Juno, IC, 14 x 20..... 5.75
Kensington, IC, 14 x 20..... 6.75
" IX, 14 x 20..... 8.00
Knoxall, IC, 14 x 20..... 6.00
Laufman's Apollo (Resquared), IC, 14 x 20..... 8.12
Laufman's Apollo (Resquared), IX, 14 x 20..... 9.37
Leominster, Extra Coated, IC, 14x20 7.75
Lion (Stamped), IC, 14 x 20..... 6.25
Lula, Best Charcoal, IC, 20 x 28 ...12.50
" " " IX, 20 x 28....16.00
Manhattan, IC, 14 x 20..... 7.00
Maple, IC, 14 x 20..... 6.50
Merchant's Old Method (Resquared), IC, 14 x 20..... 9.50
Merchant's Roofing (Resquared), IC, 14 x 20..... 8.50
McKinley, IC, 20 x 28..... 12.00
" IX, 20 x 28..... 15.00
Neville, IC, 14 x 20..... 6.00
" IX, 14 x 20..... 7.25
N. F. Old Style, IC, 14 x 20..... 7.50
" " " IX, 14 x 20..... 9.00
Old Colony, IC, 14 x 20..... 8.00
Optimus, Best Redipped, IC, 14 x 20 8.25
" " " IX, 14 x 20 9.50
Osceola, Hand Coated, IC, 14 x 20.. 8.25
" " " IX, 14 x 20.. 9.75
Palacio, IC, 14 x 20..... 5.55
Pennsylvania Old Method (Treble Coated), IC, 14 x 20..... 8.50
Phœnix, IC, 14 x 20..... 5.80
Scott's Extra Coated (Resquared), IC, 14 x 20..... 9.25
Taylor Old Style (Resquared), IC, 14 x 20..... 10.75
Taylor Old Style (Resquared), IC, 14 x 20..... 9.25
Taylor Roofing, IC, 14 x 20..... 8.00
Thomson's Puritan, IC, 14 x 20..... 5.75
Tip Top, IC (Resquared), 14 x 20..... 6.62
" " IX " 14 x 20..... 7.88
U. S. Monongahela, IC, 14 x 20..... 6.50
U. S. Redipped, IC, 14 x 20..... 9.25
Venux, IC, 14 x 20..... 5.60
Waldo Redipped, IC, 14 x 20..... 7.25
Westmoreland, IC, 14 x 20..... 6.25
Wilkinsburg Redipped, IC, 20 x 28.16.00
" " IX, 20 x 28.19.00
Willow, IC, 14 x 20..... 6.25

American Bright Plates—

Almond, IC, 14 x 20..... $6.25
Brilliant (Tissue Packed), IC, 14x20. 9.00
Climax, IC, 14 x 20..... 6.50
" IX, 14 x 20..... 8.00
Florence, IC, 14x20..... 6.75
Hazel, IC, 14x20..... 5.80
Linden, IC, 14x20..... 6.50
Merchant's Dipped, IC, 14x20..... 11.00
Merion, IC, 14x20..... 6.75
Mint, IC, 14x20..... 6.00
Palma Xtra, IC, 14x20..... 7.25
Phœnix, IC, 14x20..... 6.25
" IX, 14x20..... 7.75
Royal, Extra, IC, 14x20..... 7.00
U. S., IC, 14x20..... 7.25

Imported Terne Plates—

Charcoal.
Dean Grade.—IC, 14 x 20.....@$5.50
20 x 28.....@11.00
IX, 14 x 20.....@ 6.75
20 x 28.....@13.50
Abercarne Grade.—IC, 14 x 20.....@ 5.40
20 x 28.....@10.80
IX, 14 x 20...@ 6.62½
20 x 28.....@13.25

Imported Bright Plates—

Charcoal.
Duty: 2.2¢ ₩ ℔.

Melyn and Calland Grade.	IC, 10 x 14	@$6.50
" "	IC, 12 x 12	@ 6.75
" "	IC, 14 x 20	@ 6.50
" "	IC, 20 x 28	@13.00
" "	IX, 10 x 14	@ 8.50
" "	IX, 12 x 12	@ 8.75
" "	IX, 14 x 20	@ 8.50
" "	IX, 20 x 28	@17.00
" "	DC, 12½ x 17	@ 6.00
" "	DX, 12½ x 17	@ 8.00
Allaway Grade.	IC, 10 x 14	@ 6.00
" "	IC, 12 x 12	@ 6.25
" "	IC, 14 x 20	@ 6.00
" "	IC, 20 x 28	@12.00
" "	IX, 10 x 14	@ 7.50
" "	IX, 12 x 12	@ 7.75
" "	IX, 14 x 20	@ 7.50
" "	IX, 20 x 28	@15.00
" "	DC, 12½ x 17	@ 5.50
" "	DX, 12½ x 17	@ 7.00

Coke.
Steel Coke.—IC, 10x14, 14x20.....@$5.50
10x20.....@ 8.50
20x28.11.50@12.00
IX, 10x14, 14x20.....@ 6.75
B. V. Grade.—IC, 10x14, 14x20....@ 5.55

Imported Boiler Plates.—

IXX, 14x26..(112 sheets)..... @$13.35
IXX, 14x28..(112 sheets)..... @ 14.50
IXX, 14x31..(112 sheets)..... @ 16 00

Tinning—

Brass and Copper.....net

Tubing—

Tin..... 55%
Galvanized..... 55%

Brass and Copper.—

Standard List..... 35@40%

Troughs, Eave—See *Eave Troughs*

Trucks Stove—

Improved Lock Frame, per doz....$15.00
Steel Lock Frame, per doz..... 12.00
Daisy Improved Pattern, ₩ doz..... 18.00

Zinc—

600 ℔ casks..... ₩ ℔ 5½¢@5¾¢
Per ℔..... 6¼¢

It Is Reported—

That burglars recently entered the Hardware store of Teeple & Caldwell, Pinckney, Mich., and stole about $50 worth of Cutlery.

That William Roseberry has opened a new Hardware store at Wharton, Texas.

That the Hardware firm of Atchison & Knowlton, Newton, Kan., has been dissolved. T. B. Atchison will continue the business under his own name. The firm had been in business for 18 years.

That Alexander Warner has sold his Hardware business at Palouse, Wash., to Wheeler Bros.

That J. E. Fawcett is preparing to build a large Hardware store at Platteville, Ill.

That A. O. Wible, formerly with A. J. Turney, has entered the firm of Allshouse, Beck & Co., who have just opened a new Hardware store in Greensburg, Pa.

That C. Wirths, Hardware merchant, 844 West Indiana street, Chicago, shot and seriously wounded a burglar who on the morning of the 6th inst. tried to effect an entrance into his store.

That John P. Barnes, a Hardware dealer, who has been in business in Anderson, Ind., for more than a quarter of a century, is soon to retire. An Indianapolis firm have made a deal with Mr. Barnes and are now practically in possession of the business, as the stock has been invoiced. Mr. Barnes will be retained for the present as busines manager, but will probably retire altogether in a few weeks.

That Grossman & Geiseman's Hardware stock, at Shannon, Ill., was destroyed by fire on the 6th inst. Loss, $2000; insurance, $500.

That the Hardware store of Joseph Mohr, Danvers, Ill., was destroyed by fire on the 6th inst.

That James King's Hardware store, at Arena, Wis., was burned out on the 30th ult.

That E. W. Johnson has sold his interest in the Rockford Hardware Company, Rockford, Mich., to H. C. and W. F. Hessler and retired from the business.

That the Hardware store of M. J. Wilson, Rushville, N. Y., was broken into by burglars on the 29th ult., and robbed of 30 dozen Pocket Knives and a quantity of Table Cutlery.

That Turner & Archibald, Hardware merchants, Ridge Farm, Ill., have sold out to W. F. Jenkins & Bro.

That James A. Moren of the Hardware and Stove firm of Draper & Moren, Converse, Ind., has disposed of his interest to A. J. Webb. The business will hereafter be carried on under the style of Draper & Webb.

That the Hardware firm of Wentworth & Brown, Benton Harbor, Mich., are now Wentworth & Baker, Elwood Brown having sold his interest to J. J. Baker.

That Monroe Hoffman has opened a Stove and Tin store at Alliance, Ohio.

That the store of the Shafers Hardware Company, Butler, Ohio, was recently damaged by fire.

That H. D. Newcomb, dealer in Hardware, Stoves and Guns, Ironton, Ohio, has sold out to Goldcamp Bros. & Co.

That C. N. Hopkins is out of the Hardware business at Union City, Ind. Hatch & Hopkins will continue.

That Geo. W. Harris, Petaluma, Cal., has disposed of his Stove business to Hurd & Dies.

That E. H. Robinson has sold out his Hardware business at Santa Cruz, Cal.

That H. Edwards' Hardware store, at King City, Mo., was recently visited by fire.

That David S. Donovan has entered the Stove and Tin business at Plainfield, N. J.

Price-Lists, Circulars, &c.

WM. FRANKFURTH HARDWARE COMPANY, Milwaukee, Wis.: Price current of fall and winter goods. Illustrations and list prices are given of the Winslow and Czar Skates, Table Cutlery, flat Silver Ware, Butcher Knives, Carvers, Scissors, Pocket Cutlery, Razors, &c.

JOSEPH F. MCCOY COMPANY, 26 Warren street, New York: Illustrated circular and price-list of Coates' and French Horse and Hair Clippers, for which they are headquarters. Numbers are given of the most desirable patterns of Clippers for use on horses, especially patterns with anti-friction rollers, and for trimming horses' legs. An assortment to order is suggested as desirable for those who have never handled these Clippers.

THE CLAUSS SHEAR COMPANY, Freemont, Ohio.: Shears, Scissors, Knives, &c. A pamphlet sent out by the company illustrates the Clauss Carver, Bread, Cake and Paring Knives, also Shears, Scissors, Knife Sharpener, Flexible Pot and Kettle Cleaner. The company were awarded three medals and three diplomas at the World's Fair for Shears, Scissors and Knives.

LABOR EXCHANGE.

Notices under this heading of reasonable length are inserted free of charge. Only those relating to employment are admitted. Write distinctly on one side of paper only, and do not use postal cards.

HELP WANTED.

SALESMAN visiting hardware trade to carry patented article in constant use as a side line; liberal commission; big seller. "Galit," 85 Franklin street, New York. Nov. 18

A first-class all round PLATER for job shop. Address, with references and salary expected, Leonard C. Crouch, 13 West Bridge street, Oswego, N. Y. Nov. 18

A first-class TINSMITH; must understand all kinds of roofing and guttering, also bench and furnace work; competent to do all kinds of repairs; steady work and good wages to right man. T. W. Dorsett, 1113 Clinton street, Hoboken, N. J. Nov. 11

By a wholesale manufacturing house in Boston, a thoroughly competent and first-class HOT AIR and HOT WATER FURNACE SALESMAN to travel among the trade in New England; high grade men only need apply; a man thoroughly acquainted with the stove and range business also would have the preference; state salary desired, and give references and experience. "A. B. C.," office of *The Metal Worker*, 146 Franklin street, Boston, Mass. Nov. 11

Immediately, a good PATTERN MAKER who understands making patterns for core casting for steam and water heaters, and who can also make wood and iron patterns and do molding. H. Munson, 200 Northampton street, Easton, Pa. Nov. 11

SALESMAN, for States of Kansas and Nebraska, for a strictly first-class line of stoves; one acquainted with the trade and on a commission basis preferred; address, with all particulars, "Eclipse," office of *The Metal Worker*, 96-102 Reade street, New York City. Nov. 11

SITUATIONS WANTED.

A FOREMAN and SUPERINTENDENT of cornice shop working 50 men desires a change. "Reliable," Box 1118, office of *The Metal Worker*, 96-102 Reade street, New York City. Nov. 18

An ADVERTISING SIGN PAINTER with ten years' experience in retail trade is open for an engagement; would like to hear from parties wishing to work the California trade. H. M. Merrill, Marshall, Mich. Nov. 18

As SUPERINTENDENT or FOREMAN of stove works, by a thoroughly competent man, capable of handling a large number of men; 15 years' experience; position just vacated on account of closing of shop. P. O. Box O, Greenfield, Ind. Nov. 18

A thoroughly experienced tinware and housefurnishing goods salesman would like position as OFFICE MANAGER or BOOKKEEPER and CORRESPONDENT with large jobbing house or manufacturing concern; can furnish good references; no objection to locality. "J. S.," office of *The Metal Worker*, 96-102 Reade street, New York City. Nov. 18

SUPERINTENDENT of stove, range and furnace foundry desires position for January 1, 1894; has had 13 years' experience, and can furnish first-class references from present and other employers. "Superintendent," office of *The Metal Worker*, 96-102 Reade street, New York City. Nov. 18

With a good, reliable house as TRAVELING SALESMAN for tinners' and plumbers' supplies, hot air furnaces and steam heaters; can furnish the very best references regarding character, ability, &c. "J.," Box 1118, office of *The Metal Worker*, 96-102 Reade street, New York. Nov. 18

As FOREMAN of stove foundry; thoroughly experienced; can furnish references regarding character and ability. "W. M.," Box 38, East Woodstock, Conn. Nov. 18

As FOREMAN of brass foundry, by a good brass molder, 40 years of age, with many years' experience; steady and reliable; well up in mixtures of metal, core making and all the details of foundry work, steam and water work, machinery and general jobbing; reference furnished. Chas. McKenna, 68 Beech street, Paterson, N. J. Nov. 18

By a practical TIN and SHEET IRON WORKER, PLUMBER, and GAS and STEAM FITTER; strictly sober; single. W. G. Sofleiss, Woodbury, N. J. Nov. 18

As STOVE MOUNTER, a young man with 12 years' experience. J. P. Rothfuss, 821 Lome street, Philadelphia. Nov. 18

By a young Philadelphia PLUMBER, who has had eight years' experience; can furnish best of references; country town preferred. "J. M.," Box 1118, office of *The Metal Worker*, 96-102 Reade street, New York City. Nov. 18

A young man with two years' experience at plumbing desires a chance to finish trade and also to get a good idea of steam fitting. Thomas F. Dacey, 56 Hildreth street, Marlboro, Mass. Nov. 18

A thorough PLUMBER and GAS FITTER wants steady employment; correspond for particulars. Box 93, Naples, Ontario County, N. Y. Nov. 28

STOVE SALESMAN for Southern or Western territory or Canada, or in any position with a good concern, by experienced, reliable man; competent in costs, estimating, catalogue work and advertising, and willing to start at a reasonable salary. T. A. Hindmarsh, 308 Third street, Detroit, Mich. Nov. 18

By a young man, 23 years of age, as POLISHER on brass or iron; four years' experience; situation preferred in New York, Brooklyn or New Jersey. William Zylinski, 57 Grand street, Brooklyn, E. D., N. Y. Nov. 18

ELECTRO PLATER and POLISHER; thoroughly competent and practical electro plater desires situation; experienced polisher, grinder and buffer; strictly temperate; first-class references. "J. H. R.," 77 Cornelia street, Brooklyn, N. Y. Nov. 18

A steady job by a TIN and SHEET IRON WORKER; accustomed to in and outside work; also range and furnace work; reference if required. "W. S. N.," 144 East Front street, Trenton, N. J. Nov. 18

By a young man, 21 years of age, as BOOKKEEPER in some good reliable wholesale house; good penman and accurate at figures; references furnished as to character and ability. Isaac Smith, 113 Baker avenue, Syracuse, N. Y. Nov. 18

A young mechanic, sober and industrious, with six years' experience at all branches of tinners' trade, plumbing and heating, desires a situation in a large shop where he can get a complete knowledge of plumbing, heating and ventilation; salary not so much of an object as a good position. "Young Mechanic," office of *The Metal Worker*, 96-102 Reade street, New York City. Nov. 18

To represent a factory or first-class jobbing house on the road in the West, by a thoroughly experienced nail, steel, iron, carriage and heavy hardware SALESMAN with over ten years' experience; wide acquaintance with factories and dealers from Mississippi River to Pacific Coast; unexceptionable references; age 34. "W. S. B.," 76 Archer street, Denver, Col. Nov. 18

As TRAVELING SALESMAN, by a young man, for a hot water or hot air heating firm; seven years' experience in both lines; can speak English and German. "C. A. M.," office of *The Metal Worker*, 96-102 Reade street, New York City. Nov. 18

Steady job desired by a good PLUMBER in a shop where good work is done; New York City preferred. F. Higgins, 148 North Tioga street, Ithaca, N. Y. Nov. 18

An honest country boy, age 18, desires a position in a shop where he can learn the tin and sheet iron trade in all of ts branches; is a smart, stirring fellow, handy around horses; habits good; Any firm in want of a live, active boy will do well to give him a chance. I. Addison Brown, foreman Lee & Bunce, Box 366, Riverhead, Long Island, N. Y. Nov. 18

By a young man, where he can learn high grade steam fitting; has had five years' experience at plumbing, and 1½ years at steam and hot water fitting; thoroughly honest and strictly temperate; can furnish references. H. A. Delius, Jr., 320 Patchen avenue, Brooklyn, N. Y. Nov. 11

By a first-class TIN and SHEET IRON WORKER, in New York or in the country, within 10 or 15 miles of Newark, N. J.; 15 years' experience; can also do cornice and skylight work and draw designs and cut patterns. Henry Edlstein, 59 Lewis street, New York. Nov. 11

With some good reliable stove foundry, carriage factory or jobbing house, who are desirous of being represented in Ohio, Indiana, Illinois, or further West, on salary or commission and expenses; would make immediate engagement, or for next year; A1 reference from former employer. S. I. Hoff, York, Pa. Nov. 11

By a practical mechanic, as CORNICE CUTTER, or would work at the bench; 20 years' experience; state wages. L. W. Cutter, 488 Winchester avenue, Chicago, Ill. Nov. 11

STOVE PATTERN MAKER (wood) of considerable experience desires steady work. "J. J.," 1157 Carroll street, Baltimore, Md. Nov. 11

Experienced young HARDWARE SALESMAN of ability and extensive acquaintance wishes to represent manufacturer of hardware specialties on commission in New York, Boston and Philadelphia. "Solid," office of *The Metal Worker*, 96-102 Reade street, New York City. Nov. 11

Young man wants a situation as TRAVELING SALESMAN or SHIPPING CLERK with stove house; have had five years' experience; good habits; come well recommended. "W. H. G.," 142 West Third street, Williamsport, Pa. Nov. 11

By a young man 27 years of age, with 12 years' experience in tin and sheet iron work, roofing and general jobbing; can speak English and German; position desired in New York. John Fink, 640 East Ninth street, New York City. Nov. 11

By a BRASS MOLDER on plumbers' supplies of all kinds; ten years' experience; capable of taking charge; city or country. "D. N.," 214 South street, Boston, Mass. Nov. 11

A TIN and SHEET IRON WORKER, first-class in every branch, wants a steady job; sober, reliable and a hustler; will consider a good offer from anywhere; have had long and varied experience. "Tinsmith," 60 High street, Taunton, Mass. Nov. 11

By a special JOBBING WORKER at inside and outside work; heaters, furnaces, &c. Jos. Frank, 102 Delancey street, New York City. Nov. 11

In stove works, as WOOD PATTERN MAKER; have had 20 years' experience in that capacity; can make own drawings; understand making composition for ornaments; also can do turning. J. T. Tryon, 10 Broadway, Troy, N. Y. Nov. 11

By a TIN and SHEET IRON WORKER and GENERAL JOBBER; 38 years of age; position desired in the South. Forest Holb, Box 51, Maynard, Mass. Nov. 11

AGENCY wanted on commission for Milwaukee, a good selling line of hardware or specialties, advertiser having a good trade with retail hardware and department stores. 548 Fifteenth street, Milwaukee, Wis. Nov. 11

By an experienced traveling man, traveling in Pennsylvania, Ohio, Indiana, Michigan and Illinois, a good line to sell on commission to general hardware and stove dealers. "A. B. C., No. 114," office of *The Metal Worker*, 96-102 Reade street, New York City. Nov. 4

By a PLUMBER and GAS FITTER, who can also do a good job at steam and hot water fitting. "Plumber," 45 Warner street, Gloucester, Mass. Nov. 4

BOOKKEEPER, thoroughly competent young man, desires position with wholesale house. "S.," Room 9, third floor, 104 West Fourth street, Williamsport, Pa. Nov. 4

By a METAL PATTERN MAKER of 20 years' experience in locks, builders' and general hardware, iron toys and novelties; competent to take charge of pattern room. "A. H. L.," 315 State street, Bridgeport, Conn. Nov. 4

As PLUMBER and STEAM, GAS and HOT WATER FITTER; 11 years' experience; can also do good tin work; situation preferred in Southern California, Mexico or the Southern States. "M. E. M.," Box 83, Unionville, N. Y. Nov. 4

By a japanner, as FOREMAN with some first-class house in the West; understands all branches of japan business on tin, iron, wood and soft metals with one coat, also all kinds of lacquers and shades to stand the press, and all shades of colors in rubber for lithographing plates to stand the press. "Japanner," office of *The Metal Worker*, 96-102 Reade street, New York City. Nov. 4

As FOREMAN in manufactory making hardware specialties, by man with six years' experience in charge of the manufacture of freezers, toys, fruit presses, tin work, &c.; best of reference. "Edwards," Box 195, Little Valley, N. Y. Nov. 4

TINSMITH, married, wants permanent job 20 years' experience in tin, copper, brass and sheet iron; stoves, furnaces, roofing and general jobbing; country preferred. "Tinsmith," 338 Twenty-second street, Brooklyn, N. Y. Nov. 4

A steady job by a PLUMBER who can do steam and gas fitting and estimate on plans; A1 reference. P. O. Box 1195, Morristown, N. J. Nov. 4

A young TINNER of three years' experience in hardware, stove and tin store and shop wants steady job as general man; have worked on tinware, roofing and spouting; best of habits and reference. "J. H. B.," care of T. J. Reece & Co., Walkerton, Ind. Nov. 4

At once, by a strictly sober and reliable young man as an all around TIN and SHEET IRON WORKER; 11 years' experience at the business; both inside and outside work; also furnace work; a first-class slate roofer and general jobber. "L.," 27 West Holiday street, Newark, Ohio. Nov. 4

THE METAL WORKER.

NEW YORK AND CHICAGO.

Saturday, November 25, 1893.

DAVID WILLIAMS, - PUBLISHER

BUSINESS OFFICES:

NEW YORK.....96-102 Reade Street.
PHILADELPHIA.....220 South Fourth Street.
BOSTON .....146 Franklin Street.
PITTSBURGH..... Room 509 Hamilton Building.
CHICAGO..... 59 Dearborn Street, cor. Randolph.
CINCINNATI.....Rooms 22-24 Pickering Building
ST. LOUIS.....Bank of Commerce Building.
CLEVELAND.....312 The Cuyahoga.

BRITISH AGENCY: The Ironmonger, 42 Cannon street, London, England.

Domestic Electrical Work.

We begin the publication this week of a serial article that we believe will be of more than usual interest and value to the plumbers and tinners among our readers. The article relates to domestic electrical work, and the successive chapters will cover all of the ordinary work of the kind. Already many progressive plumbers and tinners have added electrical work to their regular line, and we believe that they have found it a profitable enterprise. There is not so much competition in it, there is a growing demand for the installation of simple electrical apparatus, and furthermore, we believe that the prices are much better than in the regular trades. The author of these articles is an experienced person who is familiar with the subject he writes upon and is now in the practical work of electrical fitting. It is not by any means intended to be an exhaustive treatise on electricity, neither is it addressed to electricians. Particular care has been taken to avoid the use of technical terms, and the explanations are all given in the simplest possible way, so that one who is absolutely ignorant of electricity and wiring can yet learn how to do the work by carefully reading the descriptions and following the instructions step by step. All ordinary bell work, fire alarms, burglar alarms, gas lighting, &c., will be covered in the series. If there are other simple classes of work that are overlooked in the articles, we will be glad to have attention called to them, so that we may make the account complete.

Taking Stock.

The usual time for taking stock and making up the final balance sheet for the year in many kinds of business is fast approaching. With its approach, a growing anxiety to know just what the year has brought forth of prosperity or adversity will possess the minds of men to whom the memorable commercial events of the year have already brought anxiety enough. Some of these will undoubtedly have to face a very unsatisfactory result in the aggregate of the year's trade, and very few will be able to congratulate themselves upon large profits gained in 1893. The majority will esteem themselves worthy of congratulation if they have paid all expenses and come out even. All who have been able to do this may feel sure that, with improved conditions of trade certain to come, they can compensate themselves for the trials from which the business of the country is emerging.

The Annual Inventory.

Nothing exceeds the annual inventory in importance as related to good business methods. But with oversanguine or timorous men it often is made the source of gross self deception. A man who deceives himself about anything is the most complete of dupes. The man of true courage and commercial ability, however much he may be willing that others may deceive themselves as to what he may be worth financially, is most reluctant to hide from himself the exact condition of his affairs. Therefore, in estimating the value of his assets, if any uncertainty exists as to what any particular asset may be worth he rather estimates it at its lower than its higher possible value.

Assets Often Overestimated.

In manufacturing business where iron founding is a prominent element, assets frequently much overrated are the patterns, flasks, core boxes, &c. These things often cost a great deal of money in the aggregate, and in valuing them from year to year there is a tendency to put down patterns in particular at their original cost, even after they have ceased to be of that value either on account of deterioration, or because the goods they were made for have become more or less unsalable. An element in the value of a pattern is its present utility as one of the appliances for conducting business. It may, and often does, become merely so much lumber, and, as such, of no value whatever as an asset. As to core boxes and flasks, especially if these be of wood, they deteriorate rapidly in use, and an underestimate of wear and tear may lead to erroneous conclusions in the profit and loss account. An exaggerated valuation of assets has often proved a rock upon which commercial enterprises have been wrecked.

The Mayor of Boston, Mass., writes to the trustees of the Franklin fund of that city that he has "been informed that trade schools, established elsewhere, have not proved successful." The Mayor might, with advantage, collect some opinions from neighboring cities as to the success, or otherwise, of such institutions as the New York Trade School, the Master Builders' Mechanical Trade Schools of Philadelphia, or the trade school connected with the Pratt Institute, Brooklyn.

Pipe Fitter and Penman.

BY L. M. W.

Visiting a prominent heating establishment recently, a face, that had been absent for over two months during the fall, was again seen at the desk where invoices, statements and the ledger furnished ample occupation. A few minutes leisure was used for a chat, which discovered that the bookkeeper had swapped jobs with the son of the boss, and had been out getting some practical information on pipe fitting by acting in the capacity of a workman. The son had returned from a long job and wanted a little rest, and the bookkeeper made the suggestion that he would find it a pleasant change to run the office while the bookkeeper ran some pipes. The bookkeeper said it was hard work, "but look at me now, I weigh more and feel better, besides I have learned a heap. Before I started the practical work I had the theory down pretty fine, and working with an experienced old fox I had two chances to catch on and apply it, and I believe I unloaded a lot of good information on Mr. Reynard, for every morning he had some question for me that kept me thinking, and every day he gave me some new wrinkle that kept the kinks from bothering my system. I know how to handle pipe, from ⅛ to 8 inch, and a pipe wrench is as handy as a pen, and I can fill the bill."

"How did I find the books? Oh! Well! the charges are all made, but aside from that I have plenty to do to get things in perfect order again, for the junior boss is a better pipe fitter and engineer than he is a pen artist and accountant. He has one valuable qualification, however; everything is charged, with explanation when necessary, and bills were sent promptly. He recognized that connections with bad collections were disastrous, while bad connections hindered collections. I am more than pleased with my experience, and am of the impression that if more bookkeepers forgot that they had contracted for one branch of service only, and sought to acquire wider information as salesmen and practical men, they would never regret it. I know bookkeepers who are quite expert at technical accounts but entirely ignorant of goods which are the basis of the accounts.

In opening the Bride Lane Polytechnic Institute in London, on November 20, the Prince of Wales strongly advised the managers to have practical work taught by practical workmen and not through theoretical lectures by professors. The institute, which is mainly designed to furnish manual instruction in various trades, on the lines of the successful Borough Polytechnic Institute, has been built by the Corporation of the City of London, and is planted in the heart of one of the poorer quarters of the British metropolis.

THE LETTER BOX.

Tinning Cast Iron.

From G. M., *Camden, N. J.*—Please describe in *The Metal Worker* the process of tinning iron. We have some links which we wish to make into an endless chain for a machine. One is malleable and the other is wrought iron. We cannot get the tin to take well, the coating is full of blisters and some parts are bare and very rough. We used Welsh tin for the last lot.

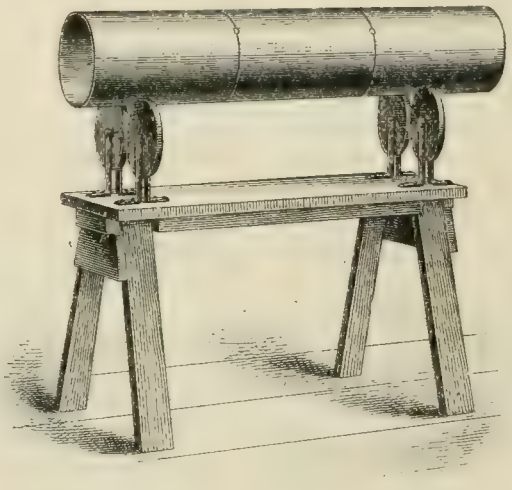
Answer.—For the benefit of our correspondent we reprint the following from *The Metal Worker* of April 4, 1891. He will find a longer article on the same subject in the issue for November 11 of the same year:

I have often seen inquiries in *The Metal Worker* for information about tinning cast iron, and while I cannot attempt to fully explain the process in a letter, some remarks on the subject may prove of interest and value. A number of difficulties are to be encountered in tinning cast iron, one of which is the difficulty of securing castings that are alike in all respects. The last iron taken from the cupola may not be like the first, as it has been subjected to the action of the heat for a longer time. Two lots of castings from the same foundry may also differ and a similar variation is found in castings from different foundries. The castings to be tinned should be first cleaned from oil or grease, which can be done by boiling in caustic soda water, after which they are to be rinsed in clear water. For the purpose of removing the scale the castings are to be placed in a pickle composed of sulphuric acid and 3 or 4 parts of water. After the castings have remained in the pickle for a few days the scale should be so loosened as to be easily removed by washing in clean water or by friction. The scale can also be removed by turning or filing. If it is not convenient to proceed with the tinning after the castings have been cleaned, they should be kept under clean water to protect them from the action of the air. For a flux, take ordinary soldering acid, to which add the one-tenth part by weight of sal ammoniac. The cleaned castings are to be dipped in this solution, quickly dried, and then dipped in the melted tin, the surface of which is to be kept from the action of the air by being covered with tallow. While the above is a theoretical method for performing the operation, it may not result successfully, as the iron may not be of such a quality as to take the tin properly. This point can only be determined by actual experiment. Care should be taken during the work to prevent the melted tin from becoming too hot, otherwise the articles will be discolored.

There is another process by which it is said that cast iron can be tinned, but it is one that should not be used for culinary articles, as mercury is used in the work. The article to be tinned is thoroughly cleaned, and must be free from oil or grease. It is then rubbed with a cloth moistened with muriatic acid, after which an amalgam of tin and mercury is rubbed over the surface. The article is then to be dipped in the melted tin. The amalgam should be of the consistency of putty. Still another method is to first coat the iron with copper, for which the following process is given: Melt in a crucible one part of dry chloride of copper and five or six parts of cryolite, combined with chloride of barium to make it more fusible. This mixture will give a permanent coating of any desired thickness to articles, according to duration of immersion, the articles having been first thoroughly cleaned by pickling in acid.

Soldering Furnace Pipes.

From J. J. F., *New York.*—In soldering furnace pipes I have found the subject of this illustration and description of great convenience, as well as a time and labor saver. An ordinary tressel made of a piece of 4 x 6 timber with four legs serves as a base, and as the upper part need not be fastened to it the tressel can be used for other things. To a board an inch thick, 10 inches wide and 4 feet long, nail two strips long enough to go between the legs on the side of the tressel. They should be nailed edgewise and so that the center of the board would come over the center of the tressel. They should be as wide as the tressel is thick, about 4 inches, and 1 inch thick. This will enable the board to rest firmly on the tressel, and it can be lifted off or on with ease. Now get four wooden wheels 6 inches in diameter and 1 inch thick and bore a hole in the center for a ¼-inch stove bolt. If you prefer you can make these wheels of tin. Bend eight pieces of the band iron that comes around bundles of sheet iron at a right angle. Make one end long enough to take two ¾ No. 9 wood screws to hold it to the board. The other end should have a hole in it for a ¼-inch stove bolt, which serves as an axle for the wooden wheels. This end should be long enough to bring the tops of the wheels about 3 feet from the ground. These uprights should be screwed fast to the board 6 inches from the end and 3½ inches from the center and 1½ inches apart, to give the wheels room to turn. Then put the wheels in place and fasten them with the ¼-inch stove bolts through the holes in the upright. Now tack three sections of 14 inch pipe on the bench and then lay them on the wheels and with some rosin run around the seam. Then with a hot copper and a bar of solder a seam can be soldered without any stops and starts, evenly all around, almost as quick as the rosin was put on. It beats a trough for quick, easy work, and saves some solder.



Soldering Furnace Pipe.

Cleaning Sewer Pipe.

From E. D. S., *Neuman, Cal.*—Is there any liquid that will cut slime loose from the inside of a sewer pipe? There is a hotel in this city which has a sink in the kitchen supplied with what seems to be a very good grease trap, but the drain pipe that leads from it to the main sewer is almost filled up, so that it takes some time to drain the sink. A force pump has no effect nor has hot water. As a considerable amount of brick work has to be removed to take it out, I thought there might be some better or easier way. I should be glad to hear from you or the readers of *The Metal Worker* on this subject.

Answer.—It is a common opinion that the only proper way to clean such a pipe is to open it, so that a brush or swab can be used to clear it. Some-

times a strong solution of lye is used. This will get the accumulation loose at the upper end of the pipe, but is likely to stop it up below. If the pipe then has to be opened up for clearing the workman who does it must be careful or the strong lye is likely to burn his hands when the opening is made. The use of the lye might be tried, and if it failed would not increase the labor of clearing the pipe with a swab later.

Capacity of Pipes.

From C. W. H., *Altoona, Pa.*—Please inform me, through *The Metal Worker*, which pipe or pipes would furnish the most water under the same pressure. one 12-inch pipe or four 6-inch pipes?

Answer.—The combined area of the four 6 inch pipes is exactly the same as that of the 12-inch pipe, so, practically, the answer to our correspondent's inquiry is that the larger pipe is of the same capacity as the four smaller ones. Of course, if he is going into very fine points, the item of friction would be greater in the four 6-inch pipes than in the larger one; but this, we assume, is not to be taken into account. The area of a 12-inch pipe is 113 inches, and the area of the 6-inch pipes is 28¼ inches each.

Partition Flues.

From CÆSAR, *Louisville, Ky* —"P. F.," in your issue of November 11, strikes the right note on the right string in discussing faulty wall piping. It is a custom among the architects in this section of the country in letting contracts on new buildings to include the wall pipes for furnace in contract for the roofing, guttering, &c. The consequence is that when the furnaceman examines the building he finds a botch from A to Z and if he has any pride for his work he will refuse to attach a furnace to such work. Right here the furnaceman is placed in a serious position. If he refuses to place the furnace the architect downs him on all future contracts. If he places the furnace it will not work satisfactorily, and again he is in a hole of such magnitude that he will never get out. On the other hand, if the furnaceman offers any suggestions to Mr. Architect he is sat down on as being very impertinent, and is informed that when he needs any information he will write him a letter. In regard to proper shape of wall piping it is to be conceded that the round pipe is the best, but where are you going to put such a pipe when there is no space for it? The usual width of stud here is 4 inches. I never use less than 4 x 12 and up to 4 x 16, and by following this rule have had unqualified success. Another point: The cause of poorly working wall pipes is often in the adjustment of sizes of round pipes from furnace to the foot of the wall pipe and in bad connections, improper protection, the use of IC tin, &c. In the use of IC tin a heavy per cent. of the heat is lost in radiation and often causes trouble with certain pipes. The architect is to blame in a majority of cases for defective furnace work from the fact that he does not make a special study of heating, and, of course, is not competent to criticise work when it is left to his judgment. The consequence is he is imposed upon by ignorant furnacemen and tinners. There is a great stress laid upon some particular make of furnace. This is all bosh. A furnaceman who understands his business can use the commonest furnace made and put upon the market if he gets his adjustment right, with a proper amount of cold air and a sufficient square area for escape of hot air into building.

Note.—Our correspondent says that there is a great amount of heat lost by using IC tin for furnace pipes. This is a common opinion in the trade, but if it were accurately determined just what the difference is in radiation between IC and IX tin we think it would surprise furnacemen to find that the variation was so little.

Making Solder.

From S. M. H., *Union City, Pa.*—Having had some experience in making solder, I would say to any one wishing to make their own solder: If your metals are pure, melt your lead and add as much tin as will make a strictly half and half solder. If the lead is not pure, put in the melted lead a small lump of brimstone and skim off the dross. Stir constantly and do not allow the metal to get too hot. In the olden time we often bought old pewter, which we used in the making of solder. Then we had certain tests to determine the quality. After getting ready to pour, we would run out a small bar, letting it cool, and by bending the bar, holding it close to the ear, if we could hear just a faint creak, we called it O. K. I once worked with a German who said they determined the quality of solder by the flower or blister which would appear upon cooling, and which is never seen in bought solder. Inclosed is a sample of the solder I make.

Note.—With this letter came a sample of solder 2 inches long, ⅛ inch thick and ⅜ inch wide, in which the creak mentioned is plainly discernible when held close to the ear and the solder bent. The general appearance of the solder would lead one to suppose that it is fully up to the quality claimed for it. This creak is due to the tin in the solder, and if there is only a small percentage of tin in the mixture the creak is not perceptible.

Pipe Fitting and Plumbing Queries.

From E. V. S., *Neuman, Cal.*—Please tell me in *The Metal Worker* if there is any preparation other than white or red lead for fitting iron water pipe together — something that will dry quickly and make a tight joint? Sometimes a joint is made as tight as tongs can make it, but it will still drip a little, and it often happens in such a place that it requires to be tight at once. I would be pleased to hear if there is anything of the kind.

Note.—If any of our readers have suggestions to make to this correspondent it will no doubt be interesting to many others. It is the opinion of a number of good fitters that whenever a leak occurs in an iron pipe water job, the only thing to do is to take out the fitting or piece of pipe and put in new, and that no other kind of a job is creditable to a first-class workman. A mixture of red and white lead is generally used and considered equal to all ordinary requirements. A cement for a quick setting rust joint is given as 1 part sal ammoniac in powder, by weight, 2 parts flour of sulphur and 80 parts iron borings, made to a paste in water. A cement was described on page 45 of *The Metal Worker* of August 28, which may be useful in this case.

Flush Tanks and Syphon Closets.

From J. K., *Norwich, N. Y.*—I have a question I would like to have explained in *The Metal Worker*. Does a syphon jet closet require a special tank? If so, what kind and in what way does it differ from an ordinary closet tank?

Note.—Some of our readers may have practical experience on this subject that will be of interest to this correspondent. As a rule, the flush tank is made to discharge a given quantity of water in a given time to suit the construction of the particular closet with which it is sold, and the experience of the trade has been that more satisfactory results are secured from the use of the closets when such tanks are used in connection with them. The difference from an ordinary closet tank is purely in the quantity and time of the discharge, which depends, as a rule, upon the construction of the valve.

Hot Air out of Cold Air Opening.

From H. N. R., *Hawkeye, Iowa.*—A small furnace that I have put in is causing some trouble, for which a remedy is desired. The furnace is set in brick, has two heating pipes, one 8½ inches, that is taken out of the top, and one 9½ inches, that comes out of the side. The latter is 5 feet long, and has a rise of 9 inches. The cold air pipe is round, 12 inches in diameter, and is taken from a window in the cellar. The opening for same is on the east side of the house, and is provided with a slide for regulating the supply of air. When the wind is from the south, warm air comes out of the cold air opening.

Answer.—As the south wind causes the warm air to come out of the cold air opening, it might be well to place a shield at the south side of opening so as to break the force of the wind. If this course was not expedient, the experiment might be tried of running a cold air pipe from the hall to the furnace. This pipe could be provided with a damper or register. When there is a wind from the south the outer opening can be closed and air taken from hall, thus preventing the wind from interfering with the action of the furnace. Conflicting currents of air so often interfere with the satisfactory operation of a furnace when wholly supplied with air from the outside of a house that it is eminently desirable to also provide facilities for taking the air supply from the inside. The occupant is then enabled to control the action of the furnace according to circumstances, and always secure good results from the fuel he burns.

Progress in Foundry Practice.

Thomas D. West of Sharpsville, Pa, in the paper read before the Western Foundrymen's Association, discusses as follows some of the phases of progress in foundry practice:

With our present methods, one field now presenting itself for the acquisition of knowledge in matters of melting and cast iron is in the chemical action taking place in the remelting of iron. I have been greatly interested in the papers and discussions emanating from this organization upon the questions of chemistry, and think the subject of the utmost importance to many foundries. There are those that can get along without having chemical service, but they are very few who could not obtain practical benefit from a use of the knowledge now obtainable upon the question. I know that in the ingot department of our foundry we could not afford to abandon chemistry. Not only do we know the chemical qualities of every charge of iron that goes into our cupola, but also that of the coke. When running full our heats range from 50 to 70 tons per day, and the product is analyzed and a record kept, so that we are enabled to ascertain if anything is going wrong and chemically compute what goes in and what comes out of the cupola.

The adoption of chemistry in our foundry was not a question of choice. We were compelled from self defense to know what our product contained, as we found our customers often attributing short service in particular molds to excessive silicon or sulphur when it was plainly not due to these causes. To protect ourselves against claims of this nature, as well as to insure uniform analyses, we found it necessary to know not only the analysis of our pig iron, but also of our product. Comparison of analysis with service naturally followed, which in time resulted in a somewhat elaborate system of records. It might be advisable to state here that in our practice we use all pig iron, and that such practice gives an advantage for obtaining reliable data that foundries purchasing scrap to mix with pig metal could not secure as readily. Generally speaking, purchased scrap iron is a miscellaneous collection of everything, and to attempt to know its chemical composition would generally involve so much labor and expense as to make it impracticable. With some scrap piles, by taking several samples and mixing their drillings, so as to obtain an average, an analysis might often work very fairly, but such a case would be the exception to the rule. It would be best in such cases, when special results are desired, to abandon the use of scrap and use all pig iron.

The president of our company, Geo. H. Boyd, has formulated quite an elaborate system for recording the chemical and physical qualities of our iron and product coming from it. The way the subject is classified enables us to obtain some very valuable data. As an illustration we will take up the question of silicon and sulphur. Here we find, by remelting or by the action of the fuel and blast in the cupola, that we reduce the silicon from one tenth of 1 per cent. to four-tenths of 1 per cent., but this reduction is generally uniform. We think it is only through some radical change in manipulating the blast to the cupola it is caused to be reduced below two-tenths of 1 per cent. On the other hand, we increase the sulphur one time two-tenths of 1 per cent., and perhaps the next five-tenths of 1 per cent., when using coke of same analysis and in uniform ratio to iron charged. The manipulation of the cupola alone seems to affect the sulphur to a greater degree than the silicon, for the silicon is generally reduced uniformly, while the sulphur seems to have no regularity about its increase; and I am inclined to think the varying temperature existing at time of meeting is the main cause of the irregularity found in the sulphur when same coke is being used. The Connellsville coke we use will average 0 80 in sulphur; the iron 1.50 silicon, 0.040 sulphur, manganese 0.34, phosphorus 0.093. The analyses of the above materials are given so as to enable any one that might be inclined to do so to take the matter up and compare notes with us.

There is a large field for investigation in chemical matters for the founder to explore, and the information to be obtained will enlighten us upon many mysteries we now find ourselves at a loss to fathom. I do not wish it understood that we are wholly relying upon the chemical analysis of iron, for there is too much to be discovered in that line ere we can ignore the physical qualities of iron in judging of and attaining results. While cupola work is progressing in respect to chemistry, I think from my late efforts and results there will be further achievements in melting barring what might come from the little explored region of electricity.

An investigation of the experiments made in cupolas with a view to economy in fuel shows that there have been many failures and we find almost all plans imaginable have been tried. Europe far surpasses this country in originality and novelty of designs, but I question if America has not excelled in the points of good general utility. The first radical benefical step we find to have been taken is in the adoption of the "drop bottom," an American invention. Ere this came in use bottoms were composed of solid masonry or fire proof material from the ground up to the spout and in order to get the "dump" or refuse out of the cupola after a heat was finished the "front breast," being made large, would be knocked out and by means of pokers the refuse and cleanings would be raked out. I am led to believe that this plan is still being used in some parts of Europe. From the adoption of the "drop bottom," improvements have been mainly in the line of securing greater economy in the use of fuel. The most radical divergence from the common cupola has been caused by experiments in designs arranged as in the Woodward cupola, which sought to create a blast economically by means of a steam jet blowing up the stack; also as in the Krigar cupola, which instead of forcing the blast upward reversed the order; then, again, as in cupolas arranged to utilize gas for a fuel. In examining some of the cupolas that have been tried one would surely think that if crooks and oddity had any virtue, perfect combustion would have been accomplished long ago. This may be secured, but we find more founders have faith in the common cupola. My definition of common cupola is one of plain cylindrical form having one or more rows of tuyeres. The question of inside formation and illogical shapes given to cupolas have about ran their course of absurdity and this has been helped by late literature upon melting. We are rapidly advancing in understanding the principles and sciences involved in the proper construction of cupolas and melting, and to-day we find the only element of any value that has been grasped from out the chaos of ruined expectations in the construction of cupolas is that of economical combustion being attained by two or more rows of tuyeres. In order that all may be able to follow this paper intelligently and understand the philosophy and advantages to be gained by "upper tuyeres" we will first note the action of fuels in order to obtain perfect combustion. "According to Dulong 1 pound of carbon combining with the necessary quantity of oxygen to form carbonic acid develops 12,906 units of heat. The specific heat of cast being about 13, the melting point 2190°, and the coke containing 82 per cent. of carbon, then to heat a ton of cast of a temperature of, say, 40° to a temperature of 2190° would require $\frac{2150 \times 2240 \times 0.13}{12906 \times 0.82} = 59.1$ pounds coke. This is supposing that the whole of the carbon is converted into carbonic acid, but if by any means carbonic oxide is formed a very different result is obtained; then 1 pound of carbon to carbon oxide only evolves 4453 units of heat. If, however, by admitting air above the zone where the oxide is formed we recover 4478 units, this plus 4453 gives 8931, which is a little over two-thirds of the available heat to be gotten out of 1 pound of carbon. Allowing 10 per cent. for moisture in the coke, 10 per cent. for radiation and 20 per cent. for loss of heat passing off at the top of the cupola, or 40 per cent. in all, the amount of coke per ton of metal should not exceed 112 pounds, although the actual consumption is, as we have shown, usually much higher."

The combination of carbon with oxygen or air blown through the "lower tuyeres" produces carbonic acid gas in the bottom bed of fuel and this in passing up through fuel heated to incandescence takes up more carbon and is converted into carbonic oxide gas. Now, if the carbonic oxide can again have sufficient oxygen or air admitted to it we will again have carbonic acid, or more nearly complete combustion, and by such alternate zones, which at every repetition become less volient, we could, if it were only practical to hit the right spot of the descending stock with the proper amount of air, almost achieve the theoretical figure of melting 1 ton of iron with 59 pounds of fuel, as given in above table; but instead of that we consider if we can accomplish such with 200 pounds of fuel we are doing exceptionally good work.

We have cupolas figured to achieve the above results by combination in tuyeres and in reality cupolas having two or more rows of tuyeres can be the only ones properly entitled to the claim of being scientifically constructed as far as the admission of blast is concerned. Were it only possible for the blast passing through their tuyeres to penetrate to the center of the cupola and have an immovable zone of fuel to play into, they might successfully accomplish the end intended, but as it is the results are but partial. It is a question if the extra burning out of the lining which two or more rows of tuyeres cause by having more melting zones does not often more than compensate for what saving in fuel may be acquired.

In the opinion of Nikola Tesla, the distinguished electrician, the people of the city of New York will eventually use electrical power from Niagara Falls to heat their houses and cook their meals.

PLUMBING and GAS FITTING.

Domestic Electrical Work.—I.*

By W. A. W.

SIMPLE BELL CIRCUIT.

In writing on electrical work for the benefit of plumbers and tinners there will no doubt be those who, without giving the matter a second thought, will say, "What do we care about electrical work? That is entirely out of our line of business; we don't get paid for doing such work as that." But suppose we look at the matter in another light. Suppose we strive to gain all the knowledge we can, and apply it to our business, don't you believe we would stand a much better show of getting paid for something we are actually doing than something we have never attempted?

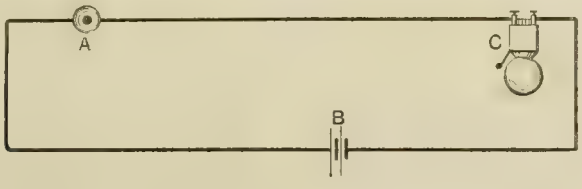
The writer has more than once heard the remark, "I am only getting $2 a day, and I am going to work accordingly." How much of a show does an individual like this stand of getting to the top of the ladder? He belongs to that class who are constantly bemoaning their fate and waiting for something to turn up. Certainly no one who aspires to a higher position or better wages can entertain such an idea. Every successful business man or employer makes it a rule to gauge wages by what an employee can earn for him, and if the $2 a day man makes no effort to earn more than he is getting, his wages surely will never be raised, neither will he be advanced to a higher position.

> Not the man who moans and cries,
> But the man who acts and tries,
> Finds the blessing 'neath the woe.

Roll up your sleeves, "act and try;" see how much money you can make for your employer. Make yourself a source of profit to him, and you will soon find that in this, as in any other respect, your employer will be loath to part with that which is a profit to him, and you will find in the majority of cases your employer will, after deducting a fair profit for himself from your labor, be willing to give you the balance of what you are earning.

But to return to my subject. There are a great many towns and cities where there are no regular electricians who do this kind of work, and consequently no one could complain that you were encroaching on their calling, and even if you did, "self preservation is the first law of nature," and we might just as well look the matter square in the face. Has not the tinware factory encroached upon our calling and deprived us of the pleasantest part of our labor?—that of all working together in the shop almost like a family during the long winter months, making up the next season's tinware. The writer well remembers the "fish" stories that were told, and the songs that were sung by the jolly crew of tinkers as they worked away at their benches those gloomy winter days. But now all this is changed, and the tinker must be able to earn enough during the spring, summer and fall to support himself in idleness a great part of the winter. Is not the carpenter encroaching upon our calling when he puts on iron roofing? Numerous instances could be mentioned where other trades are encroaching on us. Then why are not we justified in doing likewise?

The subject of domestic electrical work may appear to some as too intricate a thing for them ever to master, because electricity has for years been shrouded in a sort of mystery, but after once taking it up you will find it to be a comparatively simple thing, and the writer will endeavor to avoid all technical expressions and use the simplest terms and explanations in his efforts to awaken interest in this kind of work.



Domestic Electrical Work.—Fig. 1.—Experimental Circuit in Shop.

In the first place, get the proper tools to do the work with. These will cost but a trifle and consist of the following: A good corner brace (not ratchet, they are too slow), several sizes of small bits, one 12 and one 24 inch twist point bell hangers, gimlet about ⅜-inch hole, combination handle with set of small tools, rat tail file, small screw driver, flat chisel for taking up floors, medium sized hammer, keyhole saw, about 20 feet of flat steel spring wire for fishing purposes, 10 inches of No. 19 double jack chain, double pointed tacks, and an assortment of insulated wire, prices and descriptions of which will be found in any electrical house goods catalogue.

Next procure supplies, which consist for ordinary bell work of 3-inch bells, No. 18 annunciator wire, a roll of rubber tape, push buttons and open circuit batteries A technical description of batteries is here unnecessary, as we buy them all complete and ready to set up. They are composed of a rod of zinc (negative pole) and a cylinder or strips of carbon or porous cup filled with this material (positive pole), and 5 ounces of sal ammoniac dissolved (preferably) in soft water. The writer, however, prefers a battery having a large carbon surface without the porous cup. The direction of the current cuts no figure in this kind of work, so all you have to do is to connect the opposite ends of the circuit to the opposite poles of the battery and the circuit is complete. On receiving the supplies, if you are a novice, it is well to lay out a circuit in the shop, as shown in Fig. 1; it will give a better idea of the workings of an electric bell than any explanation can give.

A is the push button, B the battery and C the bell. Start from push button and connect a wire to each of the contact points, cutting the insulation from the ends of the wire for this purpose. Now run one of the wires to the bell and the other to the battery and connect with one of the connecting points on each. Connect another wire to opposite pole on battery and run direct to bell, connecting there with the other point. Press the button and the bell will do the rest. Do all the work on this general plan.

The next step is to go into actual work, and, as we are working from the bottom up, we will select an easy job, that of a new house in course of erection. Suppose Mr. A is building a house and you have succeeded in making clear to him the advantages of an electric over any other kind of bell (if you have he certainly has ordered one). The time to do the wiring for this job is when the house is boarded up and the partition studding set (before any lathing is done). Start in at the door where the push button is located. Bore a ½-inch hole through the door casing, about 30 inches up from door sill and at such an angle that the bit will come out behind the lath. Now from the cellar bore a hole that will bring the bit out behind the lath. Next locate the battery, which should be placed in the basement, unless it is excessively wet, in which case any other location, not too dry, may be selected. Where 12-inch joist are used all that is necessary is to nail a piece of board across two of them and set the battery on it.

The bell should be located so that it can be heard in any part of the house, and is usually fastened to a door casing. Bore a hole through the floor between the studding, drive a tenpenny nail where bell is to be fastened, allowing a foot or so of slack wire at the end by wrapping it about the nail. Run one wire from this point down through the hole previously bored through the floor into the basement, thence to door where the push button is located. Drive a nail beside the hole where push is to go and wrap about the same amount of slack wire around it that you did at the bell. Run a wire from push button to where the battery is placed, and do the same thing from the bell. The wiring for this job is now done and all that remains when the house is finished is to put up the bell, battery and push button. In putting up the bell do not cut off the slack ends of wire, but straighten them out smooth and wrap them like a spiral spring around a lead pencil. Bare the ends of the wire about ¾ inch and scrape clean and connect with binding posts on bell. This leaves all the slack wire for future emergencies and looks much better than a straight wire connection.

At the push button the wire cannot be coiled as at the bell, therefore simply bare the ends of the wire and scrape clean. Make the connection and push the slack wire back into the hole and fasten up the push. Prepare the battery according to the directions that will be found on each bell. To get a good clear ring out of the bell use two cells of the battery for an ordinary house circuit. Connect the

* Copyrighted, 1893, by David Williams.

wire from the push to the zinc we will say, though either will do. Coil up a short piece of wire and connect one end to the carbon of the same cell, the other end to the zinc of next cell, and connect the wire from the bell to the carbon of the last cell. The job is now complete and the bell should ring sharp and clear.

Plumbing Work in a New York Tenement House.

The enforcement of the plumbing regulations of New York City with an impartiality that secures to the occupant of the east side tenement the same protection from sewer gases as that enjoyed by residents in the fashionable quarters has always been claimed by the Health Department and the claim conceded by those who have had opportunities of forming an opinion on the subject. If any difference exists between the plumbing work in the two classes of dwellings it is due to the use of a more expensive quality of sanitary appliance with a more elaborate arrangement of material, but the application of scientific theories marks the one as well as the other in the exclusion of sewer air.

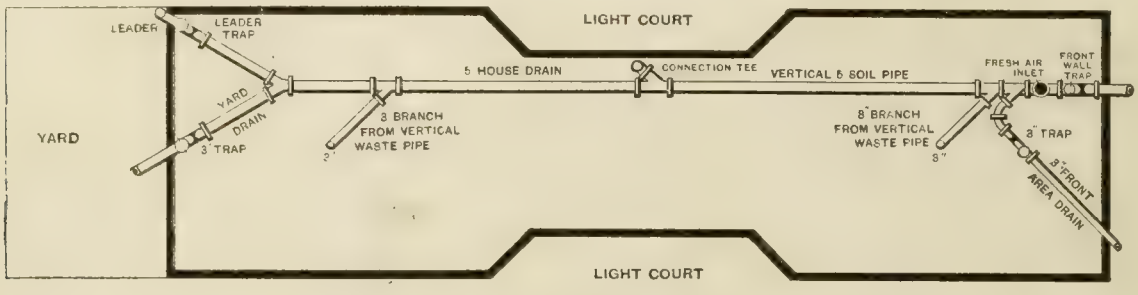
The illustration which we present in this issue shows the arrangement of the pipes and fixtures in an average New York tenement of what is known as the "cold water class"—that is, where there is no range boiler nor hot water circulation.

Fig. 1 shows a ground or cellar plan of the house drain and connections of rising lines therewith. The house drain is 5 inches in diameter, and extends backward in the cellar to receive the roof and yard drainage, the former through the 5-inch leader, the latter through the 3-inch drain pipe. The leader is generally of galvanized iron to within about 5 or 6 feet of the ground, where it is formed by a length of cast iron pipe of same diameter, which is carried through the house wall into the cellar by means of a ⅛ bend, where it is trapped and connected with the house drain. The 3-inch yard drain takes in the surface drainage of the 10-foot space required by law at rear of every tenement and lodging house and discharges through a 3-inch running trap into the house drain inside rear wall, as shown.

Sometimes a bend with a 3-inch opening is used on the leader, in which case the yard drain is connected therewith, by which means the use of the 3-inch trap is obviated, as the leader inside the rear wall answers the double purpose.

A similar drain pipe arrangement is made for the front area, the 3-inch pipe being carried inside the front wall, trapped and connected with the house drain on the house side of the running or front wall trap.

The house drain receives at front and rear the 3 inch waste pipe from the sets of apartments on the several front and rear floors of the building. These cellar connections are made with one-eighth bends at foot of rising lines and through Y-connections on house drain.



Plumbing Work in New York Tenement House.—Fig. 1.—Cellar Plan, Showing House Drain and Connections.

The soil pipe connects with the house drain about midway in the cellar, just inside the light court. There is an air shaft, size 3 x 3 feet, provided for the water closets, and in this air shaft the soil pipe, which is 5 inches in diameter, and the vent pipe (3 inches) are run. Two water closets on each floor discharge through this 5-inch soil pipe. The rising lines, therefore, in the building are one 5-inch soil pipe and one 3-inch vent pipe for the water closets, and two 3-inch waste pipes and two 2-inch vent pipes for the sinks and washtubs of the front and rear apartments respectively.

Fig. 2 shows the arrangement of the fixtures on each of the floors. In the two sets of apartments, to be found front and rear, the tubs and sinks for use in each set are placed in position on either side of the dividing partition. A double Y-branch opening is set in the 3-inch waste pipe, into which the wastes from both sets of fixtures discharge, the traps of each being properly vented, in accordance with sanitary practice.

The setting of the water closets is as closely looked after in the tenements of the poor as in the homes of the rich. The enameled iron full S-trap, if set above the floor, must be calked into the iron hub, as no other connection is allowed.

The flushing facilities are the same throughout, whether in the mansion or the tenement, and the expensive washout or syphon of the former, with its brass or nickel plated flush pipe and its copper lined and cabinet trimmed cistern, does not more effectively remove the contents of the bowl and seal the trap than the flush rim hopper of the latter, with its iron cistern and 1¼-inch flush pipe.

The care of the fixtures subsequent to their being placed in position has, however, much to do with after results, and in this respect the plumbing in the average tenement is at a disadvantage.

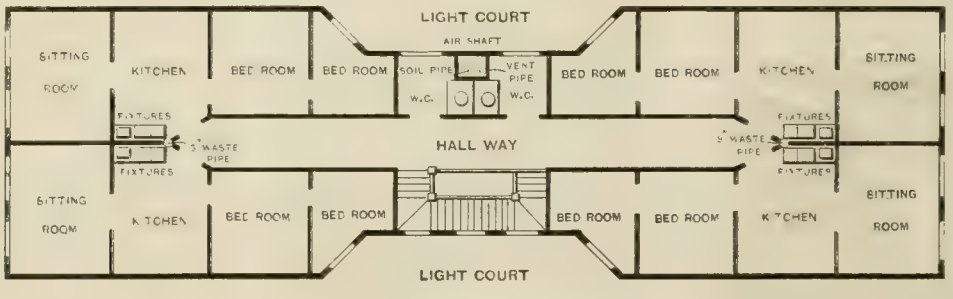


Fig. 2.—Plan of Floor of Tenement.

Interesting to Plumbers.

From OLD PLUMBER, *New York.*—Having carried on the plumbing business in New York for over 20 years, some of my recent experience may be interesting. When the new law came into effect I was examined, as it required. Whether or not I passed I don't know, and have been too busy to find out. I have been engaged principally in jobbing and repairs, which required no permit from the city departments. In one case, however, I needed a permit, and applied to the clerk, who knows that I have always had a license in the past, but he very properly refused to grant the permit, as I had taken out no license under the new law. To go to the office and find out if I had passed, get my certificate, furnish my bondsmen and secure my license would require more time than I could have spared then. So I hired a plumber, who had gone through the business and procured a license, to take out a permit to do the part of the work which required one, just the same as I do in Jersey City or other cities where I work. This was some time ago, and I am still doing business. I have no doubt but that I shall take out a license eventually, for I feel certain that I passed the examination, for here are the questions that were asked me as near as I can remember:

What have sanitary requirements to do with plumbing?

How would you make a peppermint test?

How would you make a water test?

What is the seal of a trap and its purposes?

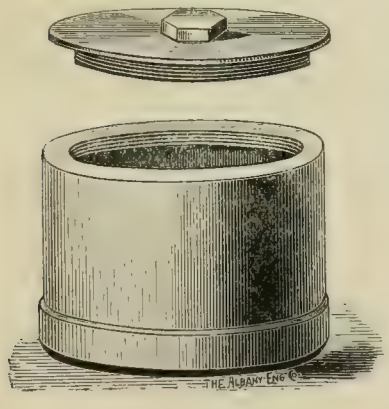
What causes a trap to syphon?

What is the construction of a pump?
What holds the water in a suction pump?
How high will a pump lift water?
What is a by way?
What is a proper soil pipe?
Give weight of lead for calking joints?
How should wrought soil pipe be vented?
Where should a trap be located?
What is a vacuum?
Where should a soil pipe terminate?
Where should a fixture be trapped?
What is sewer gas?

Note.—The experience given by this correspondent is one that is attracting attention at this time and involves a question of law. The new plumbing law, with the intention of protecting the public from improper work, provides that any citizen who wishes to earn a livelihood in the plumbing trade must fulfill certain stated requirements. Yet here is a man who seems qualified to do such work, from the fact that he had a license under the old law, but who without conforming to the new law is still working at plumbing. Referring to unlicensed plumbers, the New York law reads: "It shall not be lawful in any city of this State for any person to conduct such trade, business or calling, unless he shall have first obtained a certificate of competency from such board of the city in which he conducts or proposes to conduct such business."

Common Sense Trap Screw Ferrule.

We show in the accompanying illustration the Common Sense trap screw ferrule manufactured by Thomas



Common Sense Trap Screw Ferrule.

Hyde, 69 Perry street, Albany, N. Y. The principal features of this screw ferrule is that it is made of cast iron in regular pipe sizes, both standard and extra heavy. The opening, it is claimed, is larger than usual, and the thread is greased properly to protect the thread, making a gas tight joint. It is further pointed out that the brass cover and the iron ferrule cannot rust together.

TRAPS AND VENTS.

APPLICATION has been made for a charter for the Street & Kent Mfg. Company, at Chicago, for manufacturing plumbing supplies; capital stock, $20,000; incorporators, Conrad D. Street, Thomas M. Kent and William B. Dale.

AT A REGULAR MEETING of the Plumbing Board of Watertown, N. Y., Geo. H. Mowe passed the examination with a standing of 86 out of 90, and L. A. Howard with 48 out of 68. Both received certificates.

JOHN H. VAN TINE, 123 West 125th street, New York, is one of the uptown plumbers who reports that he is very busy.

A HANDSOME DISPLAY of gas fixtures and chandeliers and lamps, among which is a novelty in a gas banquet lamp, is the preparation for the holiday trade made by the Jos. P. Carney Gas Fixture Company, at 137 West 125th street, New York.

WILLIAM E. DONNELLY has completed his plumbing shop on Broadway, at Chicopee Falls, Mass., and the stock of stoves, &c., has been moved in. He is now ready for business in his new quarters.

WALSH & ULMER are to erect a handsome plumbing and gas fitting store and shop at Bellvue, Ky.

THE INSPECTOR OF PLUMBING, C. C. Crowley of Clinton, Mass., has gotten up an ordinance explaining all the departments of the new office and what people should do in case their plumbing is not in proper condition.

IN A RECENT ISSUE of a Chicago illustrated paper an account is given of the exhibit at the World's Fair of the Glauber Brass Mfg. Company, Cleveland, Ohio. Particular exhibits are referred to and illustrations are presented of some of their goods.

THE PHILLIPS MFG. COMPANY, 219 East Thirty-fourth street, New York, are sending out a catalogue of plumbers' specialties. Among the goods is a covering plate for soil pipes that enables a hole to be made in a pipe to remove an obstruction and then covered with the plate, which avoids the taking out of a length of pipe. The others are a wash tray plug, a new clean out filter, a ferrule burner, a center movable sink strainer, sink collars, basin clamps, expansion bolts and vent hubs.

THE PLUMBING ESTABLISHMENT of James Leary, at Monson, Mass., was recently destroyed by fire.

THE BOARD OF ALDERMEN of Cambridge, Mass., recently passed an ordinance placing the inspection of plumbing work under the charge of the Inspector of Buildings.

LOUIS VETTER is making improvements in the plumbing and sanitary arrangements of Miss Porter's school in Farmington, Conn.

CHARLES MCPARTLAND is about to open a plumbing shop at West Catskill, N. Y.

WILL TAYLOR has resigned his position with Gimbel & Co. and assumed the management of the electrical department at the plumbing and gas fitting establishment of L. W. Straw & Co., Danville, Ill.

THE SCHENECTADY, N.Y., Examining and Supervising Board of Plumbers has chosen officers as follows: William C. Vrooman, president; Dr. H. C. Van Zandt, vice-president; Frank Bauder, clerk.

THE SEWER PIPE MANUFACTURERS of the Ohio Valley met at Toronto, Ohio, on November 23 for the purpose of forming a combination. Twenty-four firms, representing more than $2,000,000 capital, are in the deal, located as follows: Nine in Toronto district, one in New Cumberland, one in Penrith, three in Wellsville, one in East Liverpool, two in New Lisbon, one in East Palestine, one in New Brighton, one in Malvern, three in Uhrichsville and one in Cincinnati. Headquarters will be established at Steubenville. T. F. Anderson of East Liverpool was elected president of the association, and C. A. Freeman of Steubenville secretary.

SMITH & WEBSTER, 193 Lake street, Chicago, are to remove their factories to 19–21 Clinton street, near Lake. Their new quarters have a frontage of 76 feet and a depth of 180 feet. When completed, the firm will have one of the most complete factories in the country for the manufacture of regular and special plumbing goods. Their showroom will be located on the south side.

THE PLUMBERS of Cleveland, Ohio, have withdrawn from the Central Labor Union because that body favored going into politics.

MONTGOMERY & PATTISON, 256 West Eighteenth street, New York, are engaged in completing the plumbing apparatus in the new Eighth Precinct station house on Macdougal street. One of the features of this job is the arrangement of automatic cisterns for flushing the water closets. The plan of the architect for the plumbing system in this building failed to meet the approval of the Bureau of Plumbing and Ventilation in the Department of Buildings, and an entirely new arrangement was laid out and drawings made by Mr. Pattison before the work could be commenced.

THE EFFORTS of the Protection Committee of the Master Plumbers' Association of New York to secure an agreement between the manufacturers and dealers to afford the plumber better protection has been attended with success. Houses that have for years refused to enter into any agreement have now consented to what was desired, after some cocessions being made on both sides. The agreement embodies the spirit of the famous "Baltimore resolutions" with the exception that selling to railroad and electrical companies and federal and city governments is not included.

The New York Trade School

Last Tuesday afternoon the Board of Trustees of the New York Trade School held their annual meeting at the school building, at Sixty-seventh street and First avenue. R. Fulton Cutting was elected president of the board and chief executive of the school for the ensuing year. At the next session of the school, on Wednesday evening, Mr. Cutting visited the different classes making an address. He stated that he would endeavor during his term of office to extend to the boys the same advice and assistance which had been received by the scholars in the past from the founder, Colonel Auchmuty, and he endeavored to impress upon them the fact that a spotless reputation was the most lasting and substantial capital that any young business man could have. His remarks were received with appreciation by all the classes.

Negotiations are reported to be on foot, backed by the Russian Government, with the view of ending the competition between the Russian and American petroleum interests, and forming a great international trust. The recent cutting of prices is said to have led up to the proposal, which is made by the Russian dealers. The alleged scheme is that Russian oil producers shall control the Eastern, European and Asian markets, while America shall hold England and Western Europe.

Management of Men and Manufacturing Industries.

FIRST PAPER.

Elements for Consideration in Locating Manufacturing Enterprises.

BY THOS. D. WEST.

It very often becomes a serious question with contemplated enterprises where to locate their works. They are often solicited to settle here and there, and shown advantages until their heads fairly swim with bewilderment. And having themselves no definite reasons why they could not settle as well in one place as another, it is no wonder they are "all at sea," and the one giving them the most wind carries them to anchorage.

No enterprise should choose a location without being able to have a chart upon which they could knowingly write the advantages and disadvantages of any place which might be brought to their notice for consideration. To have logical reasons for locating there, and not at some other point, is one of the first essentials to giving confidence in sailing onward to success, and not becoming weak-kneed at the first squall that blows adversity; for those engaging in any new enterprise can make up their minds that they will have to weather many a storm before they can reach, by experience and good financial steering, an open port in which they can be secure from foundering.

No two enterprises can be said to require the same conditions to exist in choosing localities. What might be an advantage to one would be a disadvantage to another. There is much more in being able to foresee what elements should exist than there is in seeing what do. Often the most experienced are deceived in their first conceptions and opinions. After getting started or having the plant in operation they find that they had jumped too quick at conclusions and had not taken sufficient time for investigation and study of prevailing conditions and elements which would rise, interfere, injure and be detrimental to their business.

Before treating this subject further the writer will endeavor to classify as far as he can the different conditions and elements that generally should be weighed by experience and judgment before contemplated enterprises are located. The first and in many cases the most important is: Good opportunity for procuring labor and knowledge concerning the character and training of the people where labor is expected to be obtained.

2. The advantages a locality may afford in the transportation of the concern's imports and exports.

3. Protection to life and property.

4. Cost of living and taxation.

5. The sphere there is for the enlargement of a plant.

This first proposition, that of procuring good labor in a new field, has often proved adverse to conceptions when labor came to be practically tested. Every industry has its own characteristic elements that demand from man an endurance and tax upon physical powers peculiar to and different from what some other line may call for. We find that one industry calls for spasmodic efforts of man. Another for constant steady labor—not one minute should they be idle. Then again we find industries calling for accuracy and neatness, while others require neither of such qualifications.

Still further on we see industries requiring men to withstand offensive odors and injurious dusts. Then we have those necessitating man to be standing or sitting in one position all day long. Also such as require him to endure all kinds of weather; and again we find him being required to withstand oppressive heat and flaming fires. It is often remarkable how men can be found "standing up to work" day after day that from observation or a short trial would by many be thought unbearable.

The lesson to be learned by study of the demands made upon a man's endurance in our different callings is that he can do most anything if only schooled and trained to it, but the trouble begins when we are required to do some labor foreign to what our endurance by actual experience has been trained to withstand. Of course, we have men who can conform readily to almost any kind of labor. As soon as they find some new muscles or sensibilities being made to pain or suffer they don't think they are going to die immediately. But men who will stick to labor that aches until their muscles become used to the work are scarce and far between. Any enterprise looking for a location should investigate very thoroughly the training men have had in the vicinity from which they expect chiefly to obtain their labor. For if they start in a vicinity where the schooling in endurance of labor differs radically from that which their industry demands, they can make up their minds to having much trouble and financial loss before they can procure and educate labor to profitably operate their plants. Heretofore this is a factor that has not had the attention it should have had. It has had, if the truth were only known, as much to do with strikes and failures in business as some other elements that might be mentioned. Every observing manager who has "knocked around" much will, I think, agree with the writer in saying that in changing localities he would be often deeply impressed how the little technicality and customs one place would think just right would at once cause dissention in some other locality. Therefore, to the interest of labor as well as capital it behooves the latter to use good reasoning in judging of labor in selecting its location and in the disciplining of it when first starting operations.

The Advantages a Locality May Afford in the Transportation of Imports and Exports

Means for any enterprise to figure out as far as possible what it would cost for freight or cartage of any raw materials or products it might require coming to its plant, and what it would cost to ship their finished product to contemplated customers. With enterprises intending to do a national business, the latter becomes a very important factor, for long railroad freights are a costly item, and all care in locating should be taken in figuring to avoid long hauls in freights to customers or their own plant, for ofttimes the imports or raw materials an enterprise may use in the manufacture of its product might cost more to be conveyed or shipped to its plant than its product would be to contemplated customers, and, other things being equal, it may often be much more advantageous to be located near to the section for obtaining the raw material than to the customers using the finished product.

Where a question of freights in imports or exports would be the most essential to be considered in locating, a good plan is to lay out a map, encircle by a mark the sections from which the raw materials are expected and trade to be catered for, and then locate nearest to the sections thought to be most advantageous in saving cost of freights.

Protection to Life and Property.

Manufacturing buildings going up at the present day are, as a general thing, being constructed as much fire proof as possible, and many buildings are all iron or brick and iron, and their owners care little for fire protection or insurance. If this can be done, it is certainly the wisest plan to adopt. But where it cannot be and fire protection is required, such should not be looked into after the buildings are up, as is the case many times. Enterprises locating within city limits are, as a general thing, fairly protected; but outside of such, and in villages and so forth, the protection against fire is generally very poor, and new enterprises should endeavor if at all possible to construct fire proof buildings. Another point which might be well to hint at is the question of floods. It is always well to figure to be high and dry. Protection to life is an element not to be overlooked, for all business must feel that it will be protected against ruffianism, drunkenness and theft. In cities aid can very soon be had to repel attacks or insults of this character, but in small towns, villages, and so forth, a man is generally left to defend himself, for the protection that may exist is generally so meager and out of sight it rarely can be found when wanted.

Cost of Living and Taxation.

These factors are also very essential to be investigated. If food, clothes and house rent are dear, a firm can safely figure that wages will be higher than in places where living is cheaper. As a general thing house rent is much cheaper in the smaller places and oftentimes food, but for clothes the cost is much less in the large towns and cities than in villages, and so forth. Taken as a whole the wage earner can live much cheaper in small towns, and so forth, than in large cities, and during business depressions is better taken care of when out of work in the small than in the large places, for the supply dealers are confined to a small territory for trade, and as what is one man's business is generally everybody's business, the dealer fears the ill will of one man might seriously hurt his business. Hence he will let him have credit to a larger extent than could be obtained in a large city and take his chance for pay when the man returns to work. In regard to taxation little is to be said other than upon general principle, and that is, taxation is found much lighter in small than in large places.

Enlargements of Plants.

While this is a point that would be thought to be minor and sure to be provided for, yet it is astonishing the lack of foresight manifested by many firms in locating a plant. For had they at all figured on such, thousands of dollars could often have been saved by their locating in some other locality or building different. A new enterprise, in planning their works, should look ahead and figure so that if any enlargement is necessary after they get started half of their building will not have to be torn down to obtain what they de-

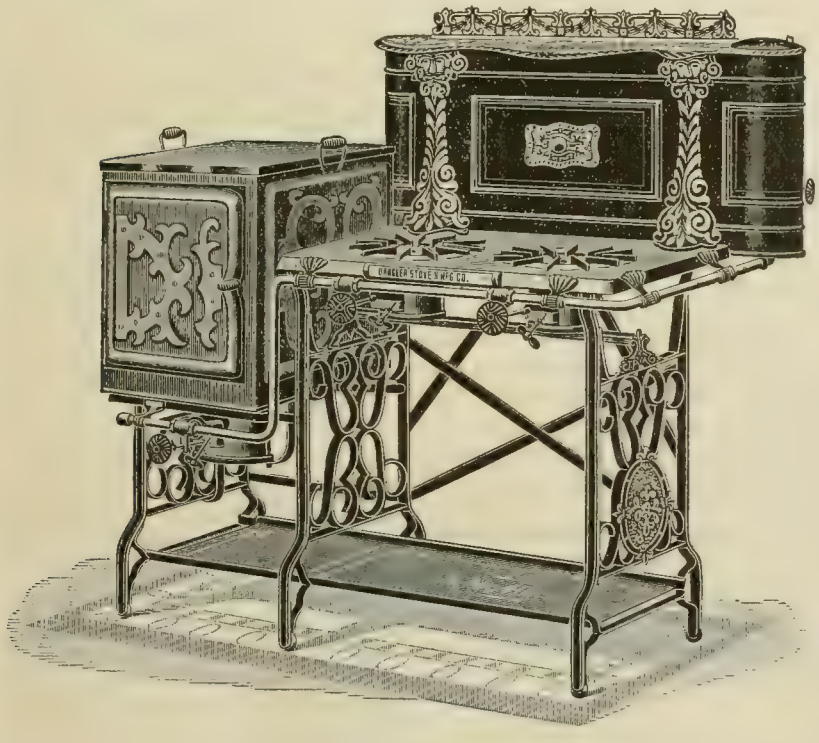
sire. The condition can be but rare that would not permit original plans to be made of the largest plant that might be necessary, and in starting in only build as much of it as will assure sufficient room for a moderate business; and then, when a growing trade would demand more room, it can be constructed without destroying present building or causing a loss of time to manufacture.

The Advantages and Disadvantages of City and Village.

It would not be doing justice to say either one was the best for any contemplated enterprises. To decide such a question can only be done by taking into consideration the various elements herein cited, and if more points are found favorable to the village let it be accepted, but if the points are in favor of the city, why then let it have the preference. Each has its advantages and disadvantages, and if logical reasoning is only used a firm will not be misguided in their choice. A few elements yet exist that might be well discussed in regard to procuring labor in the city and village. In the village labor will be found much more characteristic in having established customs and habits than in cities, and any new industry that might call for characteristic elements different than those found in the locality in which, for other reasons, they would like to locate, they can make up their mind that if they start in they will have much trouble and expense before they get their labor to the proficiency they would desire. In a large city the lines of habit and custom are not so clearly drawn, and there is a large body of labor to draw from, so that a firm can much quicker obtain the characteristic element they need to best suit their requirements of manufacture, and, of course, in the matter of obtaining supplies for repairs, and so forth, and chances for communication with the outer world by mail, wire or telephone, the city has many advantages over the village. In starting any enterprise every possible advantage should be taken. To be well located means that half the battle to win success is fought. Too much care and judgment cannot be exercised in choosing a locality, and if the reconnoiter, in starting out, will but keep in the files of his memory the factors, characteristic requirements for labor, transportation, protection to life and property, cost of living, and taxation and accommodation obtainable in matter of supplies, mail, telephone and telegraph, he cannot make any very serious mistake in selecting a locality which in after years experience will surely have proved to be a good locality.—*The Iron Age.*

The New Delight Stove.

The Dangler Stove & Mfg. Company of Cleveland, Ohio, have recently added to their already extensive and interesting assortment of stoves designed for using gasoline as a fuel the construction illustrated in the accompanying cut and known as the New Delight. The stove is furnished with a substantial frame, neatly and attractively finished in black and gilt. The special feature is the burner, which the makers claim is so simple that any child can operate it, while at the same time it is durable and economical. The company also claim that a tank similar to the one used in connection with their Surprise stove can be employed, while on account of the arrangement of the parts of which the burner is composed they can use the Process cone, giving an intense heat with an economical consumption of fluid. The expansion chamber of the burner, for mixing the vapor and air beneath, is claimed to maintain a uniform feed and pressure to the burner "without the usual method of an elevated tank or the Process principle." The theory is that the pressure is secured by the expansion which takes place in the expansion chamber, the company maintaining that the idea is new and novel, and the result of many years of study and experimentation. In operating the stove it is only necessary to light the burner once a day, and when not needed it can be turned off, as when required for cooking purposes the valve is turned and the burner lights itself. The manufacturers state that the object they had in view in bringing out this construction was a stove combining simplicity, durability and economy with a powerful burner, and at the same time something that would be convenient, safe and ornamental, and these features they are convinced are combined in the New Delight here illustrated.



The New Delight Stove.

SCRAP.

G. L. Morris and J. Williams of Landore, Glamorganshire, Wales, have been granted a British patent for a new arrangement of machinery for coating metal sheets with tin or other metals or alloys. The special features of the apparatus are that two or more plates may be passed through the rolls at the same time, and a novel arrangement of the pot in which guides are placed to direct the sheets into the rolls.

Wallace, Banfield & Co., Limited, operating the Irondale Rolling Mills, at Irondale, Ohio, manufacturers of tin and terne plate, are operating their entire plant to its utmost capacity, three turns of eight hours each being the rule. The firm have met with gratifying success since they embarked in the manufacture of tin and terne plate, and have had a ready sale for their product right along as fast as it could be turned out. They are running on orders only, and find it necessary to operate their plant as noted above in order to keep pace with the demands made upon them by the trade for their plate.

The Morewood Company, manufacturers of tin plate, at Gas City, Ind., are represented in Chicago by Saunders, Fielding & Bond, Room 419 Ashland Block, corner of Clark and Randolph streets. The company are now making several brands of bright and roofing plate, but have been hampered hitherto by the deficient supply of black plates. They started their tinning pots first, and have been purchasing plates in Pittsburgh, as well as importing from Great Britain, but in a very short time they will have an independent source of supply in their own rolling mills, which are now completed at Gas City and will be run slowly until the machinery is found to be in proper condition for regular work.

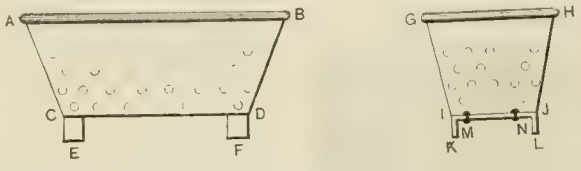
N. & G. Taylor Company, Philadelphia, manufacturers of tin plate, have just sold a lot of their roofing tin to the Harvey Steel Car & Repair Works of Chicago. This firm have secured the contract for altering about 200 of the Illinois Central Railroad cars that were in use during the World's Fair. N. & G. Taylor Company report that the demand for their brand of Taylor Old Style is very large and constantly increasing.

The St. Louis Tin Plate Works, operated by the St. Louis Stamping Company, started up full Tuesday morning after a shutdown of several weeks' duration for repairs. They will employ between 600 and 700 men. They report an increasing demand for tin plate, and hope to run full time for an indefinite period.

ROOFING AND CORNICE.

Fire Pan or Paint Burner.

From W. N., *New York.*—For the benefit of roofers or tinners in general, who have more or less repairing to do, I submit diagrams and descriptions of a fire pan or paint burner which is used in repairing roofs. As is well known, in repairing old roofs the paint must first be scraped off before soldering, and as some roofs have two or three coats of paint, it requires not a little time and labor to scrape off the paint with a scraper until a smooth surface is obtained, so that a joint can be made with solder. The illustrations show the method of constructing a fire pan or paint burner.



Fire Pan or Paint Burner.—Fig. 1.—*Side and End View of Pan.*

In Fig. 1, A B C D represents the side view of the fire pan and also shows the side view of the legs E and F. G. H I J is an end view, showing the band iron legs K L riveted to the bottom of the pan at M and N. A wire is placed at the top of the fire pan, shown by A B in side view and G H in end view. After the pattern is laid out holes are punched in it before forming up. The holes are punched in the entire bottom and all around the four sides to within 1½ inches of the top edge, a hollow punch ¼ inch diameter being used for the purpose. The corners can be double seamed or riveted, as in the illustrations. Fig. 2 is a perspective view of the finished fire pan with full size measurements. The pan is usually made from No. 22 black iron, a wire or seamed edge being placed at the top, as shown. The legs and the handle are made of the band iron with which the sheet iron is packed. When using the pan a few small, hot coals are taken from the fire pot and placed inside, then the pan is filled to the top with charcoal broken into small pieces. By having the holes punched, as shown, a draft is created so that the charcoal gives off an intense heat. After finding the spot on the tin roof which is to be repaired, the fire pan is set over it for a few minutes and the result will be that the paint begins to crack and blister so that it can be easily scraped off with any piece of stiff metal. The tin plate is then wiped smooth and bright with a rag, which enables one to solder with ease. The handle, which is riveted to the end of the pan, as shown in Fig. 2, has a hole punched in it at H for hanging it up when not in use.

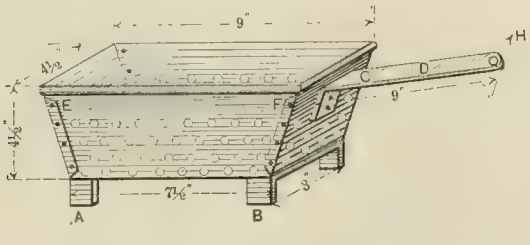


Fig. 2.—*Finished View of Pan, with Measurements.*

The Iron and Steel Roofing Industry.

In looking backward over the conditions that have existed in the iron and steel trade during the past six months it may be a source of wonder to many that those mills devoted to the manufacture of sheets of the lighter gauges have been running steadily notwithstanding the hue and cry about hard times and the unparalleled, complicated labor troubles which have claimed so much attention locally and generally. In searching for reasons why sheet mill operators should be the favored few the main causes soon become apparent. Building has not been interrupted to any great extent during this year and the demands of iron roofers and cornicemen for black and galvanized sheets have been quite lively compared with activity in other branches of the trade. It is these demands which are the life of the sheet iron trade and their importance is probably only thoroughly understood by those having a direct connection with the business.

Without taking into consideration the quantity of galvanized sheets consumed by manufacturers of cornices, skylights, ornaments, conductor pipe, &c., figures regarding quantities of sheets annually consumed by manufacturers of iron and steel roofing prepared ready to lay will probably surprise the uninitiated.

Twelve years ago the sale of iron and steel roofing and siding, such as corrugated, rolled roofing, standing seam, V-crimp, beaded siding and the innumerable variety represented in the hundreds of patents granted to roofing men, had to be pushed hard, and traveling men were obliged to spend their time telling customers in the best and most effective language they could command the virtues of the new material and instructing how it should be applied. The order of things is now changed. Good advertising does nearly all the work of selling, and as the quality is necessarily nearly uniform, the stock used being standard grade, the seller who names the lowest price and best terms usually gets the orders.

The State of Ohio produces fully one-half of the total quantity of iron and steel roofing sold in the United States. As nearly as can be ascertained, Cincinnati was the first important seat of the industry and it still heads the list as a producing center. The first business of the kind was established about 1868, and up to 1880 there were some few additions made yearly to the number of manufacturers. It was a hard struggle against prejudice, and not more than 15,000 tons of sheets were consumed for the purpose during 1880. After this time, however, the material found favor and a wonderful development commenced. It has increased year by year and there are now about 75 concerns engaged in the business, East and West. A conservative estimate of the annual consumption of iron and steel sheets for these purposes is about 100,000 tons. The surface which this enormous quantity of material would cover may be easily estimated, basing the weight at 1 pound per square foot when laid. To give an idea how the above figures are arrived at, a table is printed below showing the approximate tonnage of 59 manufacturers:

	Number of manufacturers.	Tons.
Ohio	27	55,000
Illinois	8	10,000
Pennsylvania	5	4,000
Missouri	3	8,000
West Virginia	3	8,000
New York	2	2,500
Indiana	2	1,000
Minnesota	2	2,000
Michigan	2	1 000
Tennessee	1	1,250
New Jersey	1	500
Massachusetts	1	500
Alabama	1	7?0
Kentucky	1	2,000
Small manufacturers	..	3,500
Totals	59	100,000

It would be interesting to illustrate how this enormous quantity of material is handled, but as the machinery used for the purpose is mostly built to special

designs, and as details of economical and effective manufacture are closely guarded, information on the subject is not considered due to the trade generally. It is sufficient to say that vast improvements have been made, both in the power of producing quantity and good quality, and the low prices at which iron and steel roofing is now sold are due to energy and enterprise spent in this direction. The favor into which this material has grown is illustrated by the figures presented. In Australia and other British colonies the use of iron and steel for roofing purposes has been an established industry for a great many years, but the methods of applying it are not so effective as in the United States. American ingenuity has developed the industry into a distinctive business, and the sales have increased during about 12 years from $1,000,000 to $6,000,000 per annum.

FLASHINGS.

THE *Southern Journal of Commerce* of Birmingham, Ala , states that one of the industries most needed by the South is rolling mills for the manufacture of sheet steel for roofing purposes. The great State of Texas alone would, says the *Journal*, absorb the product of several sheet trains, and at present prices it would be a difficult matter to name any branch of the iron or steel business that would yield, in the South, as handsome a revenue to its owners as a large sheet mill properly managed.

THE SLATINGTON-BANGOR SLATE SYNDICATE report that orders for slate are coming in in far greater volume than was expected. There were shipped during the month of October 3280 squares, or 68 carloads, of roofing slate and 22,000 square feet of blackboards, besides several carloads of milled stock and mantels. Last week the syndicate booked two Western orders, for the season of 1894, of 41 carloads of roofing slate. Mr. Foote, the manager of the syndicate's business, recently stated as follows : "Everything indicates a prosperous year for slate in 1894. Architects all over the country are preparing plans and the building movement will probably be the largest in the country's history. This means an increased demand for slate, which is constantly growing in favor as the only desirable roofing material. Money is easier and collections are very satisfactory with us. Our trade in the South has opened full of bright promise."

THE ROANOKE ROOFING & METAL CORNICE COMPANY, Roanoke, Va., have been awarded the contract for the galvanized iron work on the Anson County Court House being erected at Wadesboro, N. C.

C. S. WEBER & Co., 415 Broadway, New York, sole agents for the American Wire Glass Mfg. Company, Tacony, Pa., have just closed two large contracts for wire glass. One contract calls for 6000 square feet of ¼ inch thick wire glass, to be used as a roof for the New York Post Office. Geo. Bickelhoupt is furnishing the skylight work. Another large contract calls for 1700 square feet of ¼ inch thick wire glass, for two of the largest skylights ever designed or used in New York. They were designed by Architect Stephen D. Hatch, and the contract for the work was awarded to Geo. Hayes, the expert on fire proof construction.

THE AMERICAN ROOFING COMPANY, St. Louis and Cincinnati, report an increasing trade from both their St. Louis and Cincinnati houses. They confidently expect to equal their November business of last year, and with orders already in hand and others in negotiation will doubtless do so. They are increasing their force and are running nearly all departments full time.

HEATING AND PLUMBING.

NEW WORK AND CONTRACTS.

SOME of the new contracts that will occupy the time of Geo. B. Brown, 125th street and Fourth avenue, New York, are for the plumbing in the new Twelfth Ward National Bank on 125th street, an apartment house at Sixty-sixth street and Ninth avenue and a private residence at Sixty-ninth street and Fifth avenue. He is also engaged in remodeling the plumbing arrangements in the stations of the Manhattan Elevated Railroad.

J. P. CLARE & SON have recently installed a Volunteer steam heater in the Hose house at Hudson, N. Y. A toilet and bath room are yet to be built and equipped with plumbing fixtures.

GEO. M. ROSSMAN has received the contract for a steam heating plant for the Y. M. C. A. building at Keene, N. H., and will use Exeter radiators.

THE CONTRACT for the interior finish, plumbing and approaches to the new Post Office building, Jackson, Mich., has been let to R. M. Jack & Son for $22,000, they being the lowest bidders.

BATEMAN BROTHERS of San Francisco, Cal., have been awarded the contract for finishing the interior of the San José Post Office building and putting in the plumbing and gas piping for $30,470.

THE SANITARY PLUMBING COMPANY, Oskaloosa, Iowa, have closed a contract to place one of their Ideal heaters in the Wightman Building, in that city.

BENNETT & PECK COMPANY, Cincinnati, Ohio, have been employed by the Board of Education of that city to put in their new automatic ventilated flushing closets in the Tenth District School. Recent contracts for apparatus of this kind in connection with the heating and ventilation of school buildings have been closed by the Board of Education at Columbus, Tiffin and Cleveland, Ohio; Logansport, Auburn, Richmond, South Bend and Shelbyville, Ind.; Dayton, Piqua, Marion, Kent and Hamilton, Ohio; Johnstown, Tyrone, Allegeheny, Duquesne and Pittsburgh, Pa., beside other towns in the West and South.

SEALED PROPOSALS will be received at the office of the Supervising Architect at Washington, D. C., until December 12, for the plumbing and sewerage at the U. S. Court House and Post Office building at Helena, Ark. Drawings and specifications may be obtained from the Supervising Architect at Washington or from the custodian at Helena.

THE STEAM HEATING PLANTS in the Town Almshouse and the Sisters of Notre Dame Convent at Milford, Mass., have just been completed by Henry Willard. He used Exeter radiators.

F. COGGESHALL, Providence, R. I., has used the Exeter radiators, made by the Exeter Machine Works of Boston, Mass., for the following contracts in Providence, R. I.: Young Women's Christian Association Club, Hazard Memorial Hall and the residences of E. A. Loomis, W. H. Ballou, Charles C. Harrington, E. C. Ostby, E. Baxter, W. J. Crossley, James Estes, E. C. Burnham, Dr. J. H. Akers, Mrs. Honora Connors, William M. Bailey, Edward Short and H. R. Farnum. Mr. Coggeshall is free in his commendation of the finish, construction and work done by the radiators.

THE J. L. MOTT IRON WORKS, 311 and 313 Wabash avenue, Chicago, have finished the large heating contract for the First Congregational Church at Kenosha, Wis. A recent letter received from the church trustees speaks of the results as more than satisfactory.

THE BAKER & SMITH COMPANY, 193 to 197 Van Buren street, Chicago, are to furnish a horizontal tubular boiler and radiators for the steam heating in the flat building of J. B. Scott, Ashland Boulevard.

C. F. MONROE has been awarded the contract for installing the steam heating and plumbing fixtures in the Orphans' Home at Washington, Ind.

J. C. RIGHTER recently installed a Sun steam heater in the residence of H. F. Bacon, at Salem, N. J. Ten radiators were used, and on making a test not a leak was found or a sound heard. The boiler is so arranged that it is said that it can be changed to a hot water apparatus in a few minutes.

SCHOOMAKER & WILLIAMS, Walden, N. Y., have secured the contract for heating the new M. E. Church at that place, having been assisted by A. H. Phelps, a representative of the American Boiler Company, and the plant will be installed according to plans made in their engineering department. The church and Sunday school, having a space of 220,000 cubic feet, will be heated by steam with direct radiation of the Bundy pattern and a No. 58 Florida heavy duty steam boiler.

GEO. B. COBB & Co., 42 Duane street, New York, will use 1800 feet of Bundy radiation and a double Florida boiler in heating the new Elmore Ferris Building, at Pawlings, N. Y.

STEPHEN BANSON, 357 West street, New York, has the contract for heating the new City Hall and Opera House at Hudson, N. Y., and the Brooks store building and Opera House at Athens, N. Y. He will use Florida steam boilers and New Excelsior radiators.

THE L. J. MOTT IRON WORKS, 311 and 313 Wabash avenue, Chicago, furnish the plumbing material for the New York Life Insurance Building, Y.M.C.A. Building, and stations of the Metropolitan Elevated Railroad in Chicago.

DANIEL KAY is installing a hot water heating plant in the residence of Thomas Albertson, at Westmont, N. J.

MACDONALD & Co , 296 Third avenue, New York City, are erecting the plumbing system in the Home Life Insurance Company building at 256 Broadway. This building is 15 stories high, and the drainage system will be of the wrought iron screw joint pipe character.

THE ROOSEVELT BUILDING, Thirteenth street and Broadway, New York, for which Stephen P. Hatch is the architect, will be heated by a plant in-

stalled by the Baker & Smith Company, who will use 13,000 feet, or about two carloads, of radiators made by the American Radiator Company. Another contract which they have in hand, for which they will use the same style of radiator, is the new American Theater at Eighth avenue and Forty-first street.

G. A. SUTER & Co., 139 South Fifth avenue, New York, are installing a heating plant in the National Shoe and Leather Bank, at Chambers street and Broadway, using Perfection radiators.

GILLIS & GEOGHEGAN, 33 South Fifth avenue, New York, are installing a steam heating plant in the Corn Exchange Building, at Beaver and William streets, using the American Radiator Company's radiators.

SEALED PROPOSALS will be received for the erection of a court house at Alexander, Douglass County, Minn., up to January 4, 1894, by Fred Von Baumbach, County Auditor. The building will include a heating and plumbing system.

Evolution in Iron Founding.

Writing in the June number of the *Engineering Magazine*, Simpson Bolland entertainingly traces the evolution of the iron founders' art from its earliest stages down to the present time. Of this article we give the following abstract, which contains a good deal of interesting information in regard to old methods and modern improvements in the foundry. In introducing his sub ject, Mr. Bolland makes passing mention of the biblical references to iron and to the statement of Pausanios (A.D. 120) that Theodorus of Samos was the first to discover the art of casting in iron and making statues of that metal, about 440 B.C. As no tangible evidence of his skill has survived, however, he must have died leaving the world no wiser as to the methods he pursued. At any rate, no mention of the casting of iron is found until 1544, in which year a patent was granted in England for a process of this description. Nevertheless, works written much later than that date give no intimation of castings being made from this metal.

About 1740, we are informed, iron cannon were successfully cast in the South of England by workmen who were afterward taken across the Channel to teach the Frenchmen the new art. At this time there were very few furnaces that would produce more than 1 ton of pig iron per day. Consequently, where the foundry operations were of more than ordinary magnitude, a number of these miniature blast furnaces might have been seen at work together.

REAUMER'S METHOD.

Reaumer, the great French metallurgist, published in 1722 an interesting account of the methods then practiced by him. The remelting of the pig iron had previously been conducted in crucibles, but he conceived the idea of facilitating foundry operations by melting his metal in direct contact with the fuel, using for this purpose what may be taken as the forerunner of the cupola at present in use. A shaft was provided which fitted the top of the crucible, into which the iron and fuel were charged at the top in alternate layers; the blast, produced by two large blacksmiths' bellows, was forced in at the lower end of the shaft, and maintained at a vigorous rate until the requisite quantity of iron was melted, after which the shaft was removed, the *débris* cleared away, and the crucible, containing the molten iron, was emptied into the molds. From this we may date the beginning of modern foundry methods.

It was not until Reaumer's death in 1757 that these primitive cupolas came into anything like general use, though the itinerant founders of the day were not slow to discover their practibility as portable furnaces. These "tinker founders" traveled about the country making cast-iron weights, plates for different purposes, cast new and patched old hollow ware.

But it appears that Abraham Darby at his iron works in Coalbrookdale, England, had been making cast iron with pit coal, and casting articles therefrom, secretly, since 1713. After his death in 1717 the new enterprise was carried on by his son and namesake, through whose exertions coke, instead of charcoal, was finally used in smelting in 1760. The steam engine of Watt coming into use at this time revolutionized iron manufactures. By its means blast power was increased, and all rude contrivances, as blacksmiths' bellows and rotary machines driven by horses or oxen, which had been employed for creating blast in furnaces, were abandoned in favor of blowing engines driven by steam.

INCREASED DEMAND FOR IRON CASTINGS.

Castings in iron for the early engines of Boulton and Watt were made at the Darby Foundry at Coalbrookdale, as were also those for the first cast-iron bridge, which was erected over the Severn in 1779. As the practicability of steam power became manifest the demand for iron castings increased, and these had to be of a superior kind to the very ordinary castings first made. Nearly all parts of engines, including crank, connecting rod and beam, were then made in cast iron of elaborate and intricate design. The difficulties attending the early efforts in this line were great; and all this new work had to be done by molders who, necessarily without knowledge of the nature of materials, had to grope their way with only painful experience to guide them. Nevertheless examples of high-class molding, made in loam and dry sand, were set in those early days, which, with very few exceptions, have abided with us, unaltered, to this day. The screw propeller is an instance of this, being still molded after plans discovered in the early days of steamboating.

OLD AND NEW METHODS.

Up to 30 years ago very few of the improved methods of molding now practiced had been introduced in the foundries. The ponderous and slow wooden cranes have, by a gradual process of evolution, merged into machines of wonderful efficacy, and are now almost automatically controlled. The overhead trolley for conveying molten iron direct from the cupola to any part of the foundry is a great advance over the old system of hand carrying. For the time-honored wheelbarrow has been substituted the conveyor, which hauls everything to its destination entirely clear of the foundry floor. Where once all the iron and fuel were carried by hand to the cupola scaffold, provision is now made of electric, steam or hydraulic appliances for performing this work. The old rule of thumb methods of charging the cupola have given place to the more economical system of weighing all material in correct proportion. Many minor improvements, too, have been made. The riddle is superseded by the swinging and sliding machine riddles or the revolving screen; cleansing mills, provided with an exhauster for carrying off the dust, have replaced the primitive methods of scrubbing the sand off the casting. Loam mills are used instead of the chopper. Modern and ingenious methods for clamping together the flasks have been devised, and Nasmyth's geared ladle is much used.

CHEMISTRY IN THE FOUNDRY.

One of the greatest aids to modern founding is the system of tests, chemical and physical, to which, by some firms, the pig iron is subjected before it is charged into the cupola. When eminent chemists inform us that whatever quality of iron the iron founder demands can be furnished by the furnace manager, it would seem that it only remains for the foundryman to acquire such chemical knowledge as will enable him to know the exact measure of every element needed to produce the desired quality of iron, and thus by chemical analysis determine all his mixtures.

The introduction of some late inventions for melting iron indicates the march of progress in this particular very forcibly. Every effort is now put forth to prevent the immense waste of heat which occurs in ordinary cupola melting by a disposition of the tuyeres such as will burn the ascending combustible gases without heating the fuel to incandescence, in which instance the developed heat preheats the iron and fuel before it reaches the melting zone. What may we not expect in the prevention of heat waste when we find that electricity has at last been successfully applied for melting cast iron? It is claimed for the "Taussig" electric system of melting cast iron in exhausted chambers that oxidation and creation of air bubbles are avoided, and that the cost of driving the dynamos is 50 per cent. less than would ordinarily be required for melting by the best practice.

The advent of the chemist in the foundry marks a new era in iron founding, and is perhaps the surest indication of a desire for thorough advancement, as by his aid the indecision and doubt hitherto existing must ultimately cease. Mixing of different brands of cast iron, as well as the alloying of cast iron with other metals, to obtain a higher degree of homogeneity or any other special quality in the resultant casting, will, under such qualified direction, be more easy of accomplishment.

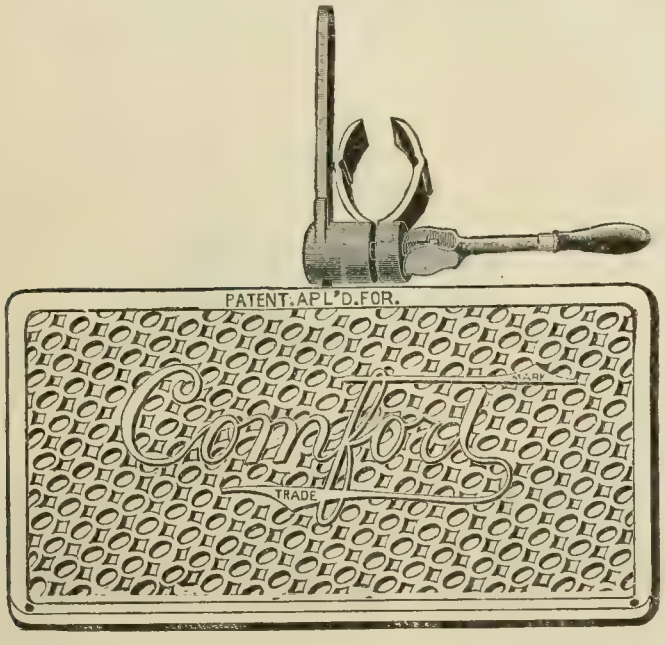
Given superior direction, we may confidently anticipate the time when, by the united efforts of the scholar and the trained artisan, the art of iron founding, in neither equipment nor skill, shall be second to any of the iron industries.

"El Cid," late of the Morgan line, purchased by the Brazilian Government and fitted out as a war vessel, sailed from New York under her new name, the "Nictheroy," on Monday. She took on board the former steam yachts "Javelin" and "Feiseen," now turned into torpedo boats, and a large supply of torpedoes and ammunition. The steamship "Britannia," also purchased by Brazil, is taking in her supplies and will follow as soon as her heavy armament is received. Rumor has it that the insurgent Admiral, Mello, is making preparations to intercept the vessels.

STEAM AND HOT WATER.

The Comfort Foot Rest.

The illustrations herewith show a radiator attachment manufactured by the A. J. Bennett Patent Radiator Attachment Company of Woonsocket, R. I. Fig. 1 shows the attachment ready to be connected and Fig. 2 shows it in place. It consists of an ornamental fret work casting, which is arranged to be attached to any and all radiators by means of a specially constructed connecting device, which permits it to be adjusted at different hights and angles,



The Comfort Foot Rest.—Fig. 1.—General View of Foot Rest.

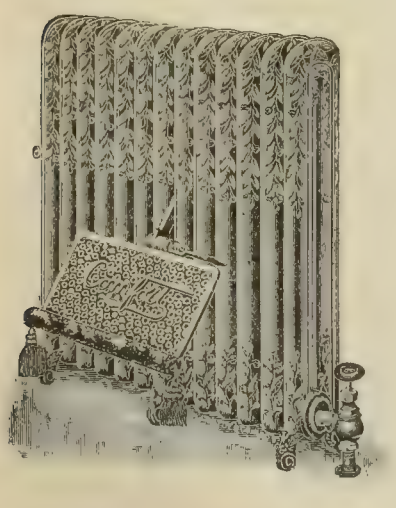


Fig. 2.—Foot Rest Attached to Radiator.

or dropped down when not in use to save space. It is called by them the Comfort foot rest, but can be used for a warming shelf very acceptably in a dining room and elsewhere. It is furnished with a handsome plush roll in different colors, adding much to its appearance.

D. Saunders' Sons

of Yonkers, N. Y., send us a 90-page catalogue in an old gold cover, proclaiming that they have greatly increased their manufacturing facilities during the past year and showing a varied line of pipe threading machinery that is said to embrace many substantial improvements. The greater portion of the book is devoted to machinery adapted for use either by hand or with power, and some special power machinery. The smaller machines are adapted to working pipe from ⅛ to 2 inches, though the UNXLD is adapted for pipe up to 4 inches and is also made in portable form, so as to be readily taken to a job and attached to a bench. The large machines work pipe up to 16 inches. All are provided with adjustable expanding die head with interchangeable chasers, the large machines having numerous other specially advantageous labor saving features. Upright drilling and tapping machines are shown for working fittings up to 8 inches. These are followed by a line of hand tools, stocks, dies, taps, reamers, pipe cutters, pliers, tongs, wrenches and pipe vises. Adjustable expanding dies, nipple chucks and gripping chucks are made a feature of the catalogue.

HEATING NOTES.

A. W. JANSEN of Lincoln, Neb., recently submitted a contract for the approval of the city authorities. He offered to pay $50 a year if the city would allow him to connect with the exhaust steam pipe of the engine at the pumping station at Twenty-first and N streets. He wants to use the exhaust steam to heat his house. At the end of 10 years the city gets all the pipe used to make the connection. The proposition was referred to the city attorney and water committee.

AMONG recently authorized corporations in Illinois are the Sanitary Heating & Ventilating Company, at Peoria; capital stock, $10,000; incorporators, Roberth Strehlow, Charles F. Cooper and Robert H. Lovett.

J. S. DODGE, Minneapolis, Minn., has been granted a patent on a device for preventing soot, dust and other impurities entering with the air used in heating and ventilating buildings.

IT IS STATED that the Holland Radiator Company of Bremen, Ind., have erected a branch works at Avonmore, Pa., some 40 miles from Pittsburgh.

J. B. PIERCE of the Pierce, Butler & Pierce Mfg. Company, Syracuse, N. Y., spent a few days this week in New York City.

THE CAUSE of defective circulation that was reported to a prominent house by a customer was found on investigation to be a hole big enough to put both fists in, in the chimney just above the smoke pipe. On stopping the hole with bricks and mud at hand the fire brightened and circulation started immediately.

THE SANITARY HEATING & VENTILATING COMPANY, at Peoria, Ill, have recently filed articles of incorporation with a capital stock of $10,000. The incorporators are Robert Strehlow, Charles W. Cooper and Robert H. Lovett.

HIS MANY FRIENDS in the heating trades will regret to learn that A. C. Mercer of the H. B. Smith Company, 133–137 Centre street, New York, recently fell down a hatchway in an unfinished building where he was overlooking the installation of a heating plant. This misfortune, coming just as he was recovering from breaking a shoulder blade in a previous accident, again confines him to his house, as the injuries sustained, while not considered serious, are severe.

A. H. DUDLEY, one of the traveling men of the Herendeen Mfg. Company of Geneva, N. Y., is making a few days' stop at the New York office recently opened at 206 Centre street.

ONE OF THE NEW THINGS seen on the sample floor of the American Radiator Company at 92 Centre street, New York, is the Detroit flue radiator. This radiator is made for window use and in sizes varying by an inch in hight from 13 inches to 20 inches. Another thing that they are sending out to keep their goods before the architects is a handsome white metal pen rack, a feature of which is a section of the Detroit radiator.

The passenger transportation record of the Illinois Central Railroad Company during the six months of the World's Fair reaches the unprecedented total of 19,342,684 persons carried on their lines.

THE RETAIL STORE.

Union Skate Sharpener.

The Union Hardware Company, Torrington, Conn., and 95 Chambers street, New York, are putting a skate sharpener on the market, as shown in Fig. 1.

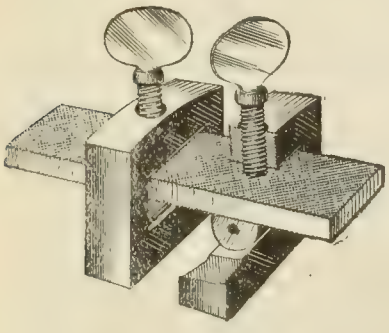


Fig. 1.—Union Skate Sharpener.

A file 1½ inches long, ¾ inch wide, is held in two metal frames by set screws. The file rests on rollers, one side of which is flattened, to allow the frames to be adjusted to any make or style of runner. In Fig. 1 one of the frames is cut away to show the position of the screw and roller. In operation the sharpener is adjusted to the skate as in Fig. 2, and is pushed forward and backward on the runner. The manufacturers claim that the article sharpens perfectly with little labor; that to use it requires no practice or skill, a child being able to do as good work as a machine shop; that being composed of but three pieces it is easily adjusted at once; that the sharpening is done with a file set in frames, and can be so adjusted that there is no chance to do anything but perfect work, and that it can be carried in the pocket, always ready for work.

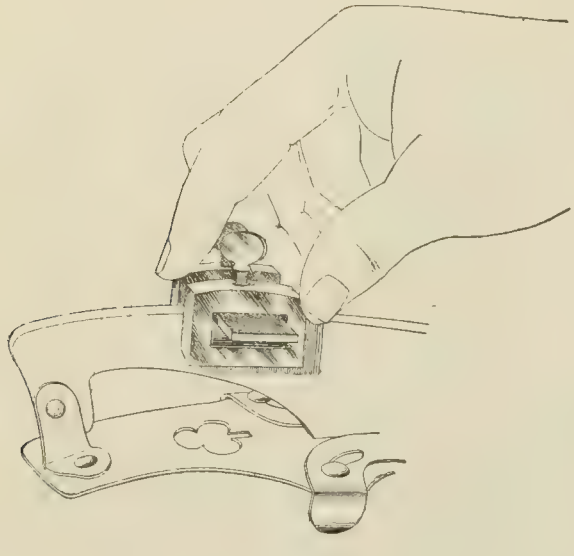
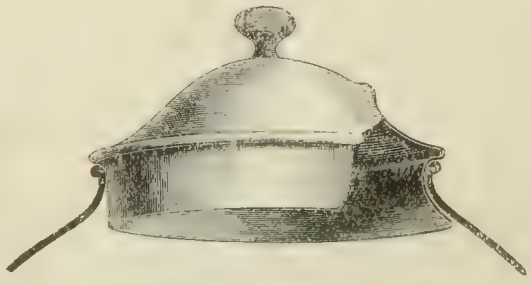


Fig. 2.—Skate Sharpener in Use.

Hingeless Cover.

Stransky & Co., 27 Murray street, New York, are introducing hingeless covers, as shown in the accompanying cut, in connection with their Cameo English tea pots. The breast of the pot is represented by the lines on each side of the rim of the cover. It will be noticed that one side of the rim corresponds to the shape of the breast lines, while the other side of the rim is straight, also that a small elevation on the cover above the rim indicates the point at which the flare of the rim is the most pronounced. In use the cover is placed on the tea pot so that the flare of the rim is at the back of the pot nearest the handle. As the pot is tipped forward the flare of the rim is to prevent the cover from falling off the pot. The cover is stamped from one piece of metal, which obviates the possibility of the rim coming off.



Hingeless Cover.

The committee appointed by the Brooklyn (N. Y.) Board of Education to inquire into the best systems of manual training, with a view to the establishment of a manual training school in that city, are actively engaged in investigating the subject. They are visiting a number of similar institutions in other cities from which they will select that which they consider the best system of instruction in order to adopt it in their new school.

Changing a Credit into a Cash Business.

BY E. D. WARNER.

That a business upon strictly a cash basis is preferable to one part cash and part credit, or to one all credit, is conceded by all progressive merchants. But while the theory and desirability are granted, the practicability is doubted—in fact, even derided. To a merchant starting a new business, to open and continue an all-cash trade is comparatively a simple matter; the rub comes upon changing a credit into a cash business.

CAN IT BE DONE

without injury to my business? Most emphatically yes, if one has push, patience and perseverance, but if one be weak and vacillating, then a negative answer must be given. While the beginning may be marked by a decrease in the amount of sales, yet the net profits will usually be found to be as great, if not greater, than before; for in a part cash and part credit business three-fourths of the profits will result from the cash part. A large share of the items of expense, if examined carefully, will be found to consist of matters relating largely to the credit side of the ledger, such as bad debts, bookkeeper, cost of collection, extra help required, interest on capital invested and a number of other charges traceable to the same cause. In a cash business these are eliminated, while as added sources of profit we have cash discounts, increased custom because of lower prices, quick returns upon compound interest of money invested and the freedom from that peace destroyer, worry. Besides, one has his business well in hand, is ever pushing it, and with a gilt-edge credit—the best of capital.

LESSENED SALES.

Without doubt the first year or two will see lessened sales, but remember it

is but the shrinkage from inflation to real value and that the growth afterward will be more healthy and satisfactory than it ever otherwise could be.

The end is desirable, but how is it to be obtained?

In the first place, decide to change to a cash basis and do it. Do as Cortez did when entering Mexico with but a handful of men against a rich and powerful nation — burn your boats behind you and press on with a firm determination to succeed, and you will. Set a day for the change, and prepare your customers for it by explaining to them as far as possible, either personally or by letter when well acquainted, by circular, as we did, or through the press, the advantages to be derived therefrom by yourself, but especially by them.

When we decided to make the change to a cash basis we issued a circular, which was distributed among our customers, as follows:

We take pleasure in announcing to our friends and the public generally that after this date we propose to conduct our business, both buying and selling, on the cash plan.

A long experience in the Hardware business has convinced us that the system of selling goods on credit, to be paid for when convenient, is a most vicious one. The increased expenses of doing a credit business, on account of salaries of bookkeeper and collector, the amount of inevitable losses every year because of bad debts, which will occur notwithstanding the most careful discrimination, and the loss of interest from having a large amount of capital "tied up" in book accounts, all render necessary a larger margin of profit, which has to be considered as business expenses and paid for by the cash buyers.

Besides this, the bad feeling constantly occurring because credit is given to one customer and refused another, and the disagreeable necessity of being obliged to "dun" customers for past due accounts, confirm us in our determination in the future to sell for cash.

In these times of close competition cash buyers expect, and are entitled to, the very lowest prices, and should not be required to pay the losses incident to a credit business.

In the future it shall be our aim, by giving the most careful personal attention to every detail of our business, to satisfy the demands of close cash buyers, and to carry a still better assortment of carefully selected lines of the following goods. Endeavoring in all things to further the interest of our patrons by giving them all the advantages of a cash system, we shall hope to merit a continuance of the patronage which we have received in the past.

On the other side of the circular we called attention to the fact that we carry in stock a large and complete assortment of the following goods, purchased direct from the manufacturers for cash. The various lines of goods were mentioned under the following headings:

BUILDERS' HARDWARE.
CUTLERY.
MECHANICS' TOOLS.
BUTCHERS' SUPPLIES.
BLACKSMITHS' GOODS.
FARMING IMPLEMENTS.
HOUSE-FURNISHING GOODS.
MANUFACTURERS' SUPPLIES.

Show by your prices how much cheaper you can sell now than before, as you surely can. It is unnecessary to make a pro rata reduction through your stock, but make leaders many and often, display tastefully, advertise extensively and trade will be attracted. This now can be done with no fear of loss. Upon those articles where competition is severe figure very low, for here comparisons will be made; but from those unattacked a good profit can be reaped. In the first case, however, good returns will be obtained because the stock is quickly turned into money and reinvested, the interest or profit being now compound instead of simple.

FOR CASH.

One, except in special cases, can always sell for cash closer than for credit, and in this way is able to make greater inducements to the public to trade with him than can his credit competitor. Without doubt a few customers will become offended when refused trust, but for every one thus lost two will be gained, and as the firms see that their money will go further for cash than when time is given they will soon return. A man if he thinks he has saved money upon an article of good quality will be pleased. Such a customer is the best advertisement one can have. Sell close at a fixed price, back it up by strict honesty and courtesy, and there will be no doubt of your success.

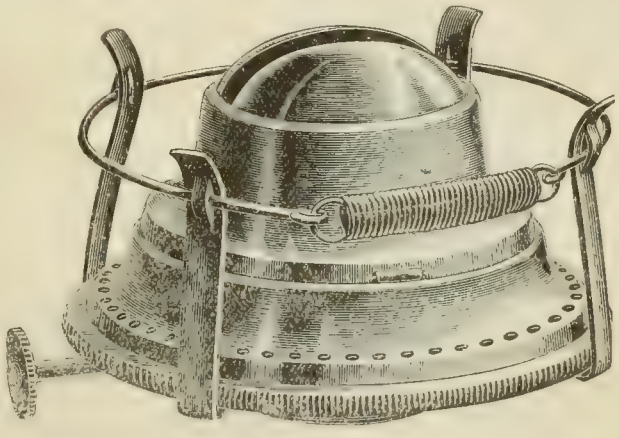
IN CHANGING

to a cash basis, to get the best results most quickly, circumstances will alter cases. With a wide fund to draw from the change can be made at once, but when restricted it is often better to allow, for convenience, a little time to those you know will pay your bill as soon as presented. They will, however, soon become educated to paying cash. But let the time given be brief as possible.

Our experience of a year in a cash business has confirmed our theory. While the amount of sales has of necessity diminished, we are constantly, by reason of reduced expenses, lower prices, &c., extending our business to fields into which we could not otherwise have gone. Moreover, while selling on much closer margins than before the change was possible, the ratio of profits to sales is greater. But best of all, when we leave at night "we go not like the galley slave, scourged to his dungeon," by worry over approaching bills, but "sustained and soothed by an unfaltering trust—we lie down to pleasant dreams."

Improved Security Burner.

The accompanying cut represents an improved burner being introduced by the Bristol Brass & Clock Company, Forestville, Conn., and 32 Warren street, New York. The improvement consists of a circular shaped wire, with a spiral spring connecting the ends. It is designed to secure the chimney in place and to make a hand lamp safe to carry about the house. The manufacturers claim that the burner secures a steady light, obviates accidents, results in better combustion and prevents chimneys falling off and breaking.



Improved Security Burner.

Selling at a Loss.

We have received the following interesting communication from an esteemed Western correspondent:

"I sold two carloads out of store Saturday, but did not make a cent—there was no profit in it." The speaker was a young salesmen representing one of the largest houses in the iron trade in the West. And why "no profit in it?" Was it because the young man lacked capacity to transact business profitably, or are his employers brainless? If no profit, then a loss. There is no other ending, except the final one of bankruptcy. And bankruptcy brought about by a policy so deliberately suicidal is positive dishonesty. All merchandise ought to be sold at a profit to the merchant. Not a profit that will enable him to just live and finally die poor, but a profit that pays his reasonable expenses of doing business and leaving him a comfortable income for old age and his family. But the policy of "there was no profit in it" induces the merchant to contend fiercely for still lower prices when buying goods, thereby forcing values downward. No sooner has he obtained a slight concession than he wires his traveling salesman "take the order at any price." And the man who has just bought at "any price" at once proceeds to "knock out" his hated rival

in business by taking the contract or order when there is "no money in it." And so he swings surely toward the point where he "cannot pay," and the one who sold him "two carloads of goods with no profit in it" is struck with possibly $15,000 worth of hopeless debt, and then proceeds to tell everybody that these are terrible times. A house strongly intrenched in capital may stand up for many years under such a policy, but the weaker ones die young.

In my experience I recall no instance of a business governed by a sound policy being forced to the wall and compelled to accept defeat. I recall a marked example of selling goods with no profit. A buyer for a large house, in my presence, made a strong attempt to secure a concession on a bill of goods, claiming that they were resold at cost. The house is noted for selling goods at low prices, and while they have secured trade in several of the Oriental countries, I have known profitable business almost at their own doors to be neglected. Why send goods to Japan while home trade goes uncared for? Why sell a carload of goods with a value of, say, from $1000 to $1500 for less profit than could be realized on one-tenth of the sum named? When we engage in business we hope to succeed; but we can only have success by getting back our dollar with interest and a profit added. Any other policy than this leads to dishonest bankruptcy.

It is time the press called attention to this subject. It ought to be placed before the eyes of every man in business, and in such a way that when he goes home he will carry the matter in his mind. Thinking about a thing at home generally results in something good.

Closely related to this matter of selling goods at no profit is this: Every traveling man ought to be instructed never to make a price on his goods unless there is a reasonable ground for securing an order. It is not good policy to walk into a wholesale Hardware house in St. Paul and, knowing that the house is already heavily stocked with nails and does not wish to buy, offer 30,000 kegs at 10 cents less than market rates. This is bound to "come back" at the traveling man's house sooner or later with bad results.

Business men, you do not like a loss in dollars and cents, but you do like to see good round profits. Some of you are not on the right track to secure the latter. Think of this matter with care and you may adopt a policy that will secure you a good return on your money invested and at a reduced risk. Better sell less and make more profit than make little profit and sell more.

Iron Clad Salamander Ware.

Iron Clad Mfg. Company, 22 Cliff street, New York, are putting Salamander ware on the market, as illustrated herewith. The body of the ware is made of steel, seamless, and is covered with Iron Clad enamel, as in Fig. 1. In addition to this, each utensil has a second bottom, as in Fig. 2, seamless, made, it is claimed, of the best quality of copper. The second bottom is perforated and ridged, and is permanently attached to the article, so that an air chamber is formed, to permit a free circulation of air, and to prevent the contents from burning or scorching. The makers claim that this ware can be used in direct contact with the fire without injury to the vessel or contents. In addition to the cooking pot shown in Fig. 1, saucepans and sauce-

Fig. 1.—Iron Clad Salamander Cook Pot.

pots are made of this ware, all in ½, 1, 2, 3, 4 and 6 quart sizes.

How to Treat Clerks.

FIRST ARTICLE.

By Fred Macey.

It is a notable fact that almost every man who has made a marked success of his business has possessed and exercised the ability to gather and keep about him good assistants. To be able to do this is one of the richest faculties a business man can possess. A man's start and early growth in business depends entirely upon himself; but as business extends duties multiply, and he is forced sooner or later to divide his duties and intrust some of them to hired help. To know just the right kind of help to se-

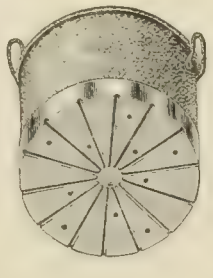


Fig. 2.—Second Bottom of Pure Copper.

lect, what duties to place upon it and how to treat it to secure his best services, is something that every business man must possess.

HUMAN NATURE.

A careful study of this subject forces upon one the fact that, while all men have their own peculiarities, which must always be taken into consideration with them as individuals, yet there is a certain likeness in human nature that makes it possible and necessary to take a certain position regarding the treatment of those in the employ of another; *e. g.*, it would not be practical for an employer to insist upon his bookkeeper using some set rule to calculate the correctness of an invoice—how he does it is a part of his education—but it is perfectly right for an employer to insist that it shall be calculated correctly. Neither would it be policy to set up certain rules as to how a salesman shall make a sale of goods, but it is entirely correct to require that if he sells he must do so at a certain price. How he does it is characteristic to himself and must be left very largely to him, but that it shall be done, and with certain results, is something that an employer has a perfect right to require.

HIS EMPLOYER'S INTEREST.

All men are engaged in business to make money, and the sooner an employer balances everything with this final end in view the better it will be for his best interests. Clerks should not be an exception to this rule, and no business man should keep in his employ any clerk that does not earn more than he receives, and it should be the aim of every clerk to serve the best interests of his employer, and the best service can only be given when a clerk works as if his employer's interests were his own. Few clerks work from this standpoint, but it is the only true one to work from. The rapid promotion of the clerk who is not afraid to work, who is constantly suggesting where small leaks may be stopped, expenses lessened, trade improved, business extended, is ample testimony to prove the truth of this rule—a clerk of this stamp is worth a dozen of those whose main aim seems to end in putting in so many hours for so many dollars.

PROMOTION.

While it is true that the value of a clerk to his employer lies mainly in himself, yet very often the employer himself is very largely to blame for the lack of results from his help. Instances come to mind of a young man who has left the service of one employer for that of a competitor. With one he could make but little progress, with the other his promotion has not only been rapid, but well founded. Why should this be so? The only answer that seems reasonable is, The one did not appreciate his ability and study to draw out his good qualities, whereas the other did.

INSIST UPON RESULTS.

Perhaps one of the most important points in dealing with a clerk is to have a definite understanding at the outset of just what is expected from him. Give him a definite field to work in and then insist upon results. Give him all the encouragement possible, but do not lose sight of results. They alone count in business. By giving him a definite field to work in the main cause for jealousies among clerks has been removed. Yet these outlines must be elastic enough to permit of suggestions that will be to the interest of the business. Throw the responsibility of a certain department upon a clerk. Hold him accountable for its success, and then, and not until then, can his ability be fully measured. No business man can hope to achieve suc-

cess without some definite end in view. Neither can a clerk.

BEING SOCIAL AND FAMILIAR.

A business man should command the respect of his employees. It is much pleasanter to receive a word of encouragement from an employer who is thoughtful in his suggestions, sincere in his actions, thorough in his work and careful of his character, than from one who is not. A cold shoulder should be turned to all familiarities from clerks. They should cease at once. They never are productive of any good and certainly do harm. Do not confound being social and being familiar. It is an employer's duty to be social toward his employees, but familiar, never. An employer who is familiar with his clerks is generally not their best friend and seldom commands their respect.

MONTHLY WRITTEN REPORTS.

Clerks should feel that their efforts are appreciated, and it is an employer's duty to know what they are doing. Many a faithful clerk has been wronged by an employer not making it his business to know for himself, and know beyond a doubt, where to place the credit for a valuable suggestion. Many times a trusted clerk is less competent than some of his assistants. Many times he takes credit of merits that belong to another, and in return receives the advancement that rightly belongs to an assistant.

Compensation of employees is one of the vexed questions that a business man must contend with. While it is unquestionably an employer's right to say what he can and cannot afford to pay for a service rendered, yet it is his moral duty to allow himself to be influenced in these matters by a strict sense of justice, and justice only. Relationships, friendships, favoritism or sentiment should find no consideration whatever in these matters. When a young man feels that nothing stands between him and promotion except merit, he then has an incentive to push to the front, and it is an employer's duty to see that he has credit for what rightly belongs to him. Perhaps there is no more practical way to solve this question than to have each clerk make a monthly written report of what he has done. Knowing that a report of this kind must be presented to his employer, a clerk's pride and ambition will lead him to make a good record. He becomes careful, thoughtful, ever on the alert to make a suggestion that will help the business, ambitious to produce good results. There is an incentive in these reports to a clerk to do his best. And not only this, the employer also gets better work, gets a better idea of what is being done, and knows where to place the credit. An employer who will use these reports, verify them and adopt good suggestions from them, places himself both in a position to compensate his help justly, and to adopt improved methods for his business.

UNRELIABILITY OF HELP.

Honesty in a clerk is a quality that cannot be too fully appreciated, but the multitude of cash registers and similar devices in constant daily use testify to the unreliability of help. It is an employer's duty to insure

HONESTY

as far as possible, but just how to do it each employer must decide for himself.

Confidential clerks are an absolute necessity in every business, yet how difficult it is to find them—somebody who can be trusted, who is not afraid to work, who watches his employer's interests as if they were his, who has good habits, some one who can be relied upon at any time, who never says a thing is so unless it is so.

GOING TO A COMPETITOR.

The extent to which a business man takes a clerk into his confidence must be decided by himself. There is always the liability of a man's help becoming dissatisfied and going with a competitor. This cannot always be avoided, and it is poor policy to let him know more than is necessary to the proper discharge of his duties. Unnecessary knowledge can do a clerk no good and may do an employer great harm.

CONFIDENCE.

In selling goods, clerks should be furnished with a complete list of the prices at which they should be sold. These are the selling prices, and if any special occasion seems to warrant a special concession it should come from the management. What a dealer pays for an article should be kept a matter of confidence to himself and his buyers. This information in the hands of indiscreet clerks would do more harm than good.

LET THEM GO.

When an employer engages a clerk, he agrees to give in exchange for certain services a certain salary. If a clerk insists on his salary the employer has the same right to insist on his services. Punctuality in commencing work should be insisted upon. Many an order is lost for no other reason than tardiness in opening up. Better be half an hour too early than three minutes too late. Dissatisfied clerks will appear in every business. There is only one of two things to do. Satisfy them or let them go. It never pays a clerk to stay after he becomes dissatisfied—much less does it pay his employers.

MISTAKES.

Don't expect too much from clerks. Don't expect that they will not make mistakes. They certainly will, all men do. When they make a mistake, don't forget all their good qualities; these very often more than offset the other. An employer should never lose control of his temper. Good seldom comes of it—but harm, invariably. A business man cannot afford to give way to his passion. As soon as he does, he loses the mastery of the situation. An employer cannot afford to employ uncivil clerks; he should insist on neatness, pleasant address; should discourage profanity, lounging, use of tobacco, drinking, gambling, gossiping. The absence of these qualities, gives character to a house, draws a better class of trade than where they are permitted. A customer never objects to good character, but very often finds fault with the opposite.

PERSONAL INTEREST.

An employer should always manifest a personal interest in the private life of his help. It somehow seems to bind the interests of employer and employee more than anything else. An employer who can command both the love and the respect of his clerks can always get better service, more of it, and at less cost than one who fails in this respect.

Ætna Curling Iron Heater.

Nicol & Co., 55 West Washington street, Chicago, offer the Ætna curling iron heater, cuts of which are shown herewith. The frame work fits snugly

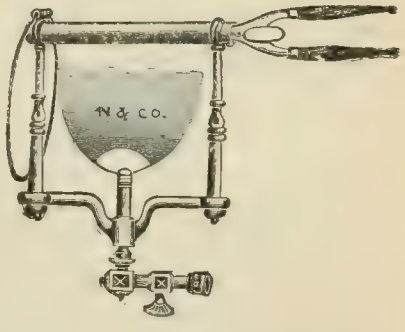


Fig. 1.—Ætna Curling Iron Heater.

over the neck of the burner, thus bringing the nickel plated case, which holds the curling iron proper, directly over the flame, thus obviating blistered or

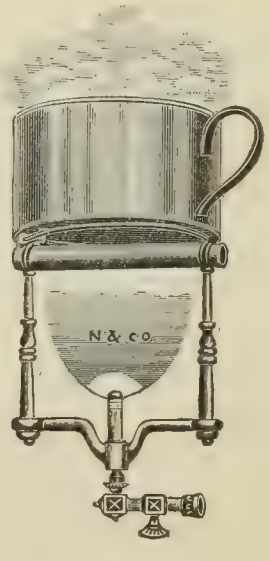


Fig. 2.—Ætna Heater with Wire Attachment.

black fingers, or singed hair. Fig. 2 shows the Ætna with wire attachment for heating liquids. This is referred to as a convenient device and as contributing much to the desirability of the heater.

STOVE TRADE NOTES.

Demand for Cheap Stoves.

Stove manufacturers observe an increased demand this season for cheap goods. To some extent there has been a lessened demand for high priced stoves and ranges. This is evidently the result of economy now enforced in every line of expenditure by families in their household expenses as well as by business concerns. An increased demand for cheap goods, however, does not necessarily mean that they are taking the place of high class stoves. Every year there are new consumers coming in the field. Newly married couples or people who have been boarding go to housekeeping and buy new outfits of furniture for that purpose. In the depressed condition of business at present they keep such expenditures down as much as possible. Cheap stoves go with cheap carpets and cheap chairs. In the case of old established housekeepers, however, an effort is usually made to get better furniture and better stoves when the old ones wear out. Rather than buy cheap goods the majority of people will patch up and repair until they see their way clear to getting a first class article. This is a promised compensation for the present period of slackening demand. As soon as times improve and workingmen are again regularly employed at fair wages, making money easier in all branches of trade, the better grades of stoves will undoubtedly be more largely called for and the trade in them will be better than ever. The competition of other heating and cooking devices will perhaps continue to increase, but there will always be a wide field for the manufacture of stoves, in which those who are most enterprising will reap the greatest benefits.

The Giraud Thermo-Electric Stove.

The following account of an electric heating and lighting apparatus is taken from the *Gas Engineers' Magazine:*

Dynamic electricity, ever since the practical introduction of electric lighting in our midst in 1878, has proved the great center of attraction to electricians, and around it have clustered some of the most brilliant achievements of electrical science. The potentialities of dynamic electricity appear to have led investigators to ignore the more modest claims of thermo-electricity as a source of light, and it has been to all intents and purposes neglected. Of late years, however, it would seem to have attracted some attention as affording a possible means of furnishing both light and heat. Hence some of our leading electricians have investigated the principle with the view of developing it into practical usefulness. Several at tempts have been made to utilize it, but none of them have hitherto succeeded commercially. Its utilization has, however, now been accomplished in an ingenious manner by Dr. Paul Giraud, a French savant, who has perfected a thermo-electric stove by which the purposes of both heating and lighting are subserved. . . .

Dr. Giraud's thermo-electric stove is, as its name indicates, for the production of heat and electricity, the current being used for lighting or for any other purpose. A portion of the heat is utilized in producing the current, while the remainder serves for heating purposes. This stove consists of an inner chamber which constitutes the stove proper and in which the fuel is burned upon the stove combustion principle. This chamber is cylindrical, and around it, at a given distance from it, are arranged the elements in a series of rings forming the battery and connected up from the bottom to the top of the stove. Outside all is the stove casing, which is of iron, the whole resembling an ordinary closed heating stove. The elements are formed of a homogeneous and constant alloy, having antimony for its base. They are of a special form and are connected together by plates of pure copper. They are arranged side by side around the stove and from top to bottom, their sockets being placed against a metal tube surrounding the combustion chamber of the stove. This tube, by conductivity, transmits the heat of the stove to the elements through a layer of asbestos board impregnated with silicate of soda, which is not acted upon by heat, and which serves to insulate the elements electrically. The elements are also further insulated by means of a paste composed of asbestos and silicate of soda. At their outer extremities the elements are cooled by being exposed to the action of a current of air, which enters by openings formed in the base of the stove and passes away by an outlet in the top cover. The current is taken by conductors in the usual way from the top and bottom of the battery and is stored for use in accumulators, or it may be used direct as produced. The products of combustion pass away through a flue in the manner common to closed stoves.

These stoves may be seen at work at the office of Messrs. W. R. Renshaw & Co., Queen Ann's Mansions, Westminster, where one is fitted up in a room about 21 feet square. The stove is about 3 feet high and 20 inches in diameter, and during 24 hours will generate sufficient current for the supply of one glow lamp of eight candle power for 30 hours or ten such lamps for three hours. During a visit six lamps of eight candle power each were being supplied by it, an excellent light being given. The heating power of the stove was far above that necessary for the room in which it was placed. An important feature of the Giraud stove is the remarkable economy which is claimed for it. The fuel consumption is stated to be only 40 pounds of a mixture of anthracite coal and coke per 24 hours, the cost of which is about 5 pence. The stoves are made of any size or power, and can be arranged to utilize the waste heat from ranges or other heat producing sources.

American Stoves for Holland.

A dispatch from Reading, Pa., announces that, as a result of their exhibit at the World's Fair, Orr, Painter & Co., the well-known stove manufacturers of that city, have just filled a heavy order for heaters and stoves to be shipped to Amsterdam, Holland. This is the first European shipment made by the firm, although they have a trade in South America and Australia. It is probable that the firm will extend their foreign trade should the practical tests of their stoves in Europe prove successful. Orr, Painter & Co. furnished some of the experimental stoves when the Reading Coal Company sent an agent abroad to introduce anthracite coal into the European markets early in the year.

In a recent number of *The Metal Worker* we referred to the assertion of United States Council Roosevelt of Brussels that a fair field for the American stove trade existed in Belgium and quoted his suggestion that the opportunity should be embraced by American manufacturers. As the two kingdoms of Holland and Belgium, which are contiguous, present very much the same conditions, the above mentioned order of stoves from Holland bears out Consul Roosevelt's opinion that a demand for such goods, of the American pattern, does exist in that region and that the trade should be cultivated.

ODD PLATES.

THE PLANT of the Schmalzried Stove & Range Company suffered damage in the great fire in Memphis, Tenn., on November 13, to the estimated extent of $35,000. They carried about $25,000 insurance.

A FEATURE of a new bathroom radiator for gas brought out by L. Ketcham, at 23 West 125th street, New York, is adjustable towel rods. The sale of his Challenge water heater for gas, which supplies a gallon of water per minute at a temperature of 150°, is increasing and large numbers are shipped to foreign countries. There are said to be 11,000 of the Challenge gas heating stoves in use.

A PLANT to manufacture steam boilers and stoves, &c., will be established at Meridian, Miss. W. R. K. Stanford of that city is said to be the moving spirit of the undertaking.

THE BAXTER STOVE WORKS, at Birmingham, Ala., have recently resumed operations, giving employment to about 50 hands.

THE PORTLAND STOVE FOUNDRY Company, Portland, Maine, notified their employees on Saturday, November 11, that wages would be reduced 15 per cent., to take effect November 22.

PRESS DISPATCHES from Dowagiac, Mich., are to the effect that the Round

Oak Stove Works of the place named closed their works on Friday, November 10, with the expectation on the part of the management of resuming operations on the first of the new year.

THE WEIR STOVE COMPANY of Taunton, Mass., are reported very busy just at present in all departments, and it is hoped that the business will continue of such a nature as to render it necessary to maintain the present activity.

THE ENTERPRISE STOVE WORKS of Vincennes, Ind., have made a contract with the Electric Street Railway Company for the installation of electric lights in their works.

THE PORTLAND STOVE FOUNDRY COMPANY of Portland, Maine, are meeting with a good demand for their St. Nicholas surface burner, which is of attractive ornamentation, fine proportions and careful finish. The makers state that the stove "was modeled by the best artists from original designs in clay." They state that the shell of the stove will not rust, nor is it liable to damage. The company have received a flood of testimonial letters from those who have purchased St. Nicholas stoves, referring to its operation in very flattering terms.

A NOTABLE FEATURE of the gas stove trade this year, reported by L. Ketcham of 23 W. 125th street, New York, is the sale of large and expensive gas logs that are large consumers of gas. These are in as active demand in the more luxurious residences as the gas radiators are in apartment houses.

THE PENINSULAR STOVE COMPANY of Detroit, Mich., favor us with a copy of a circular issued by their agent at Port Huron, in the State named. It is composed of eight pages and presents a list of some of the names of those now using Regal Peninsular square parlor heaters and Special Peninsular four-hole ranges. The two stoves named are illustrated and described, while the list of names presented gives an idea of their popularity.

HANSEN & SALTENBERGER have opened the old Humboldt Foundry at 931 Fairfield avenue, Chicago. They make a specialty of hotel ranges and light gray iron castings.

RECEIVER JOHN GUTMANN of the Albany Stove Company, Albany, N. Y., was authorized by Judge Herrick to receive sealed bids for the purchase of the plant and property of the company. The ground upon which such action was ordered was that two attempted public sales were failures. The receiver was authorized to obtain sealed bids for the property in two parcels, the real estate, buildings, machinery, tools and implements in one; the patterns, shop rights and flasks in the other. The bids are to be submitted to the court and no sale without its permission. Saturday, November 18, was the second day set by Receiver Gutmann for the reception of bids, but no proposals were made. It is understood, however, that the plant will soon be bid in.

ONE OF THE LINES OF GOODS turned out by leading stove manufacturers which has been rapidly gaining in favor with the public is the four-hole range. Although its popularity may be said to be of comparatively recent origin, the progress has been steady, and the manufacturers who have made a specialty of the four-hole range have been gratified at the success which it has met. Experience, however, has taught stove makers that the trade find a four-hole range fully adequate to meet the requirements of families of small size. One of the concerns who have been greatly surprised at the sales of four-hole ranges is the Syracuse Stove Works of Syracuse, N. Y., who on June 1, of last year completed the patterns of a stove of this class. Since that date they have been manufacturing the goods, but up to the present time they have been unable to accumulate any stock, having sold in the period named over 2000 four-hole ranges. These sales, we understand, are owing to the features of construction embodied and the satisfactory operation of the stove under all reasonable conditions. Among the letters they have received is one from a customer in Vermont relative to this range, which is known as the Magic Welcome, showing in a very forcible manner the estimation in which it is held by those who handle it in a business way.

THE EXCELSIOR MFG COMPANY, St. Louis, are sending out an advertising novelty which will be appreciated by many in the trade. It consists of a pack of 52 playing cards, on the back of which appear the words "Excelsior Mfg. Company, Charter Oak stoves and ranges, St. Louis, Mo." None of the cards carry any advertising on their face, except the joker and the four aces. The cards are of excellent quality, and one pack is sent with each Charter Oak stove or range. Parties desiring additional packs are requested to send 15 cents, which will entitle them to a pack, postage paid.

A DESPATCH from Royersford, Pa., to the Philadelphia *Ledger* mentions that all the manufacturing industries of that town and its sister borough across the Schuylkill River, Spring City, are now in full operation. These include the stove foundries of the Buckwalter Company, Floyd, Wells & Co. and the Grander Stove Works at Royersford, and the Schuylkill Valley Stove Works and those of the Yeager & Hunter Company at Spring City. Some of these works have orders ahead for several months. The twin boroughs, says the report, have not suffered as much during the panic as have other towns in the Schuylkill Valley.

THE QUICK MEAL STOVE COMPANY, St. Louis, Mo., recently made their first shipment of gasoline stoves to Africa. The Transvaal Trading Company ordered 12 of the largest size Quick Meal stoves complete, with furniture and 6 of the Quick Meal picnic stoves, to be shipped to Johannisburg, South Africa. The Quick Meal Stove Company have made several shipments to England, and for a number of years have been shipping their goods regularly to Mexico and Canada, while in Melbourne, Australia, their representatives have incorporated under the name of the Quick Meal Stove Company of Australia, for the purpose of dealing in Quick Meal stoves.

THE MICHIGAN STOVE COMPANY have put out a unique postal card, which cannot fail to attract attention, being so radically different from the Government message bearer. It is a piece of thin poplar board, a trifle smaller than the regulation postal card. A penny stamp carries it through the mails. On the reverse side appears a printed advertisement of Garland stoves and ranges headed by the appropriate question "Wood You?" On a regular postal card the company suggest that the best season of the year for the sale of cooking goods is just before Thanksgiving, and that housekeepers generally would feel more thankful for something new and modern upon which to cook the Thanksgiving turkey than for the ordinary presents which are made about the holidays. Another advertising device issued by the company is a chiromantic chart, which should prove popular among young people in trying to tell their fortunes by the marks on their palms.

ERNEST C. MOSES, assistant secretary of the J. F. Pease Furnace Company, Syracuse, N. Y., is to stay a few weeks in Chicago. The amount of business done by the firm during the season is reported to be very satisfactory.

THE GOBEILLE PATTERN COMPANY, Cleveland, Ohio, deserve especial praise for lessening the terror in which the red flag of anarchy is held. That bloody standard they have perverted to a peaceful end, and the little banner that they send out merely calls attention to the danger that lies in neglecting patterns. To avoid this danger the one thing needful is, of course, to counsel and contract with the Gobeille Pattern Company.

GAS STOVES are often decried on account of the chance they offer to careless persons for wasting the gas by their neglect to turn off the supply as soon as the heat is no longer required. This objection has been overcome in England by the invention of a simple contrivance, which turns on the cock by the weight of the cooking utensil as it is placed over the burners. On the removal of the utensil, a spring turns off the tap again automatically.

Condition of Welsh Tin Plate Market.

The present condition of the tin plate trade in South Wales is thus described by the Swansea representative of the *Iron and Steel Trades Journal*, London, November 11 : The tin plate market is going from bad to worse. In the western valleys of Monmouthshire most of the works are at a standstill, and so little prospect is there of any revival that the workmen have been counseled by employers to seek work elsewhere. At Abertillery only four mills are kept going, while at Machen black plate alone is made. There is considerable distress existing at Pontymister, Nantyglo, Blaina and Abercarn. In some parts of Glamorganshire a similar state of things prevails. The men employed at the Aberdare and Melingriffith tin plate works have received notice to terminate contracts. At Neath, however, affairs are brighter. Three mills are being added to the Eagle Tin Plate Works, which will afford employment for nearly 150 additional men ; while the Cilfrew Tin Plate Works, which have been idle for nearly six weeks, are to be restarted on Monday next. The two new mills erected at the Dafen Tin Plate Works, Llanelly, are nearly completed, and will be started in the course of a few weeks.

FRED. W. CLARK, for many years one of the leading stove merchants of Rome, N. Y., has sold out his business at 174 West Dominick street to Isaac B. Adams of 319 West Court street. Mr. Clark, who has large land interests at La Porte, Texas, will leave with his family December 5 to reside there.

Price of Gas at Toledo.

The Council Committee of Toledo, Ohio, in approving the following ordinance on the price and quality of gas, have made a move that will be welcomed by the manufacturers of gas stoves as well as the public:

AN ORDINANCE

Fixing the price of illuminating gas to be charged by companies furnishing the same in the city of Toledo for a period of ten years.

SECTION 1. Be it ordained by the Common Council of the city of Toledo, That companies furnishing gas for illuminating purposes in the city of Toledo may charge therefor not to exceed 90 cents per 1000 feet from January 1, 1894, to January 1, 1899, said gas to be 18 c. p., which prices are hereby fixed for illuminating gas of 18 c. p. for a period of five years, as above specified; Provided, that when bills for gas remain unpaid for a period of ten days after presentation, said companies may charge and collect therefor at the rate of 15 cents additional for each 1000 feet.

SEC. 2. No charge shall be made for gas furnished for illuminating purposes of less than 18 c. p., and no company furnishing gas under this ordinance shall charge for adjusting the meter (including the lead tubing, meter cock, wrench and all other material and labor) a sum greater than the following, to wit:

For a No. 3 or 5 size meter	$2.50
For a No. 10 size meter	3.15
For a No. 20 size meter	4.40
For a No. 30 size meter	5.00
For a No 45 size meter	6 25
For a No. 60 size meter	6.90
For a No. 80 size meter	7.50
For a No. 100 size meter	9.40
For a No. 150 size meter	11.25

Provided, That no company furnishing gas under this ordinance shall make any charge for resetting a meter or setting a meter in the same place from where a meter has been removed by said company.

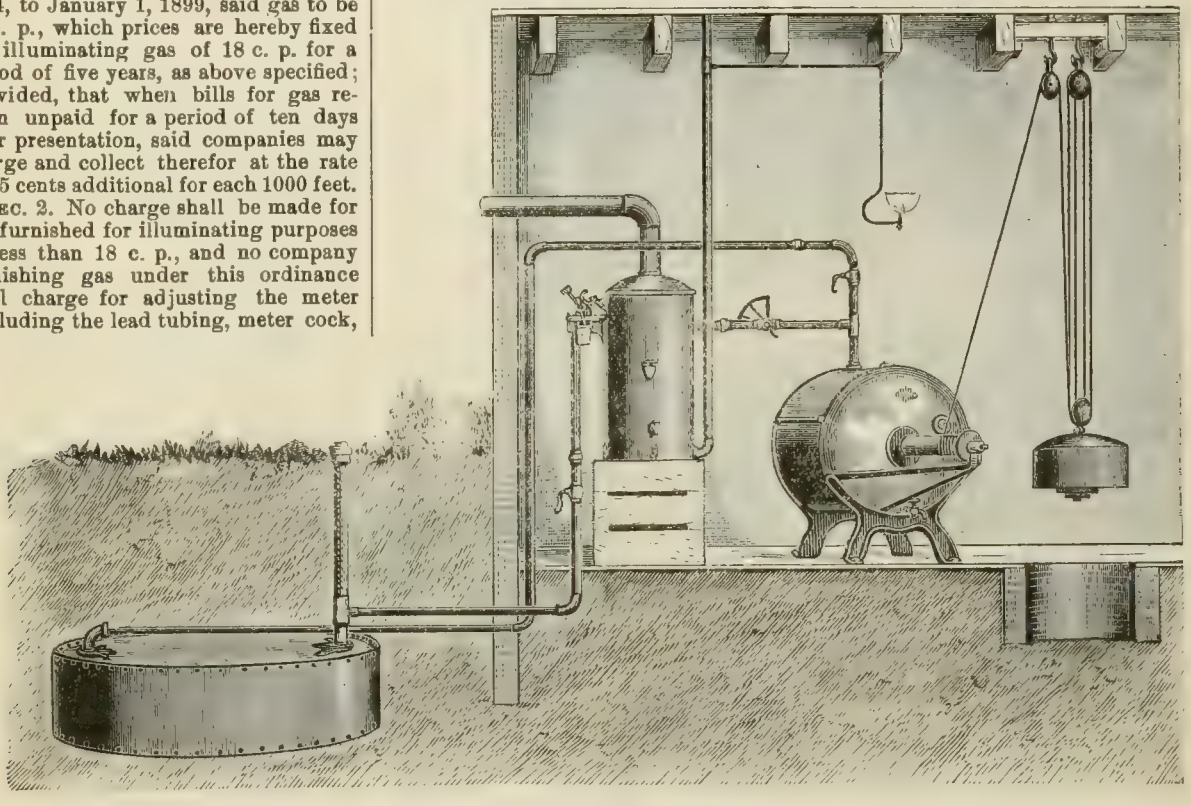
SEC. 3. No company furnishing gas under this ordinance shall be required to render a bill in any month where the amount of gas consumed in that month is less than 200 feet, but may make a service charge of 25 cents in lieu of said bill and in full payment of said amount of gas so used in said month.

SEC. 4. When any company shall file with the City Clerk their acceptance in writing of the terms hereof, as provided in Section 2479 of the Revised Statutes of Ohio, this ordinance and such acceptance shall be deemed a compliance with Sections 2478 and 2479 of the Revised Statutes of Ohio, and after such acceptance said company or companies shall not be compelled by said Common Council to furnish illuminating gas at a lower price than herein named during the terms for which such price is fixed.

SEC. 5. This ordinance shall take effect and be in force from and after its passage and legal publication.

The Improved Climax Gas Machine.

We show in the accompanying illustration the Improved Climax gas machine and Gas Mixer manufactured by Clarence M. Kemp, Baltimore, Md. The cut shows the apparatus in place and ready for operation. The Climax gas machine has been improved in several ways, the latest patent on it having been issued in October of this year. These gas machines are intended for lighting country residences, hotels, colleges, churches, institutions, &c. It is claimed to give a cheap, brilliant and highly satisfactory light, and it is particularly pointed out that the flame is smokeless and that the gas may be burned with plain lava tips, thus obviating the necessity of using the argand or other form of adjustable burner. It is said that gas with this machine can be furnished at an expense of from 65 to 75 cents per thousand cubic feet, according to location.



The Improved Climax Gas Machine.

At a recent meeting of the New York Board of Fire Underwriters a resolution was adopted authorizing the president of the board to address a communication to the Governor of the State of New York, calling his attention to the enormous increase of fire waste of late years, due largely, in the opinion of the underwriters, to the improper wiring of buildings for electric lights and power, asking his influence to secure legislation which shall require that no person shall be permitted to wire buildings for electric light and power purposes who has not been duly licensed as competent to perform the task by some Board of Control competent to test the qualifications of applicants, as is now the case in connection with engineers having charge of boilers.

W. H. Preece, the famous English electrician, remarked during his recent visit to this country that one of the things that struck him most forcibly was the number of very young men that were coming to the front in the various branches of electrical effort. This impression might well be intensified by a recent announcement that the control of the entire electric system of the town of Bloomfield, N. J., has been placed in the hands of a juvenile electrician named Perry, whose years number just 15. This electrical prodigy has, it is said, invented a model electrical car possessing points of merit, and he is at work on other experimental lines in the same field.

By the use of the improved dock equipment at the ports of the Lake Superior region, the expense of handling the iron ores has of late been remarkably reduced, as well as the time occupied in loading and unloading. Where the expense of putting the ore into the holds of vessels was estimated at from 10 to 15 cents per ton, with the apparatus in use at some of the docks this ore is now lifted from the vessel, carried back 350 feet, and dumped, at a total cost, including all expenses, of from ¾ cent to 1½ cents per ton. With 21 men in the hold of a vessel carrying 2000 tons of iron ore, the entire cargo has been stocked in 17 hours.

The longest iron railway bridge on the European Continent was opened last week across the river Vistula, between Forden in Prussian Poland and Culmsee in Germany. It is 1450 yards long and cost 8,000,000 marks.

TRADE REPORT.

The Iron Market.

The event of the week has been the sudden cessation of war among the Steel Rail mills, through the completion of an arrangement by which the Illinois, Carnegie, Cambria, Bethlehem and Lackawanna mills lease the Rail making plants of the Maryland and Pennsylvania Steel companies. We understand that the former will be closed down with the exception of the Marine department, and that the latter will cease making standard sections, a business from which it has practically withdrawn for some time. The price of Rails is now $24 at Eastern mills and $25 at Western works, for delivery during the year 1894.

On the whole, reports from the different markets are not encouraging. Pittsburgh concerns are making what is practically a clean sweep in Eastern markets. They are underbidding in a way which leaves rolling mills east of the Allegheny Mountains hopelessly out of the race. It almost looks as though their future existence depends upon the grace of the Smoky City. At present prices for raw materials and present rates of labor the mills of Pittsburgh and its allied districts can put down Rolled Iron and Steel in Eastern markets below the cost of production of Eastern mills. That fact has been proven during the past few months. The only consolation is that the Western works are unable to supply the whole demand in times of ordinary business activity.

Pig Iron.—As indicating that low prices for Pig Iron are attracting attention in distant quarters, the fact is cited in the New York market that an English house has bought 5000 tons of Alabama Coke warrants at the reported price of $7.50 for No. 3, equivalent to $7.25 at furnace. Consumers are showing but little interest in the market, although bargains keep cropping up. We quote: Northern brands, $14 @ $15 for No. 1; $13 @ $14.25 for No. 2, at tidewater. Southern Iron, same delivery, $13 @ $14 for No. 1; $12 @ $13 for No. 2; $11.50 @ $12.25 for No. 3; $11.75 @ $12.25 for No. 2 Soft, and $12.25 @ $12.50 for No. 1 Soft.

No material change can be noted in the Philadelphia Pig Iron interest, unless it be that sellers appear to have better control of the market. Good buyers can get all the Iron they want at last week's prices for reasonably early deliveries, but for long dates sellers either quote slightly higher figures or postpone acceptance of bids that have been made to them. There is a strong impression that the ultimate outcome will be a rising market. For the present quotations for Philadelphia deliveries may be given as follows:

No. 1 Foundry	$13.75 @ $14.25
No. 2 Foundry	13.00 @ 13.25

Chicago advices intimate that the drop in Southern freight rates has disappointed all interested, as it brought no improvement in the volume of business. Consumers are only purchasing according to their necessities, and few are inclined to anticipate their requirements to any extent, even if the bait of lower prices is held out. The sellers of both Southern and local Coke report the week very quiet. The demand for Ohio Soft Irons has made marked improvement within the last few weeks, owing to the scarcity of local brands of Soft Iron. Charcoal Iron market is irregular. Some makers are getting more anxious to sell and transactions which have recently come to light are on a somewhat lower basis. Bankrupt stocks are still being offered, and these tend to depress the market. Quotations are now as follows for cash:

Lake Superior Charcoal	$15.50 @ $16.00
Local Coke Foundry, No. 1	13.50 @ 14.00
Local Coke Foundry, No. 2	12.75 @ 13.00
Local Coke Foundry, No. 3	12.25 @ 12.75
Local Scotch	14.00 @ 14.50
Ohio Strong Softeners No. 1	15.50 @ 16.00
Southern Silvery, No. 1	@ 14.25
Southern Silvery, No. 2	@ 13.75
Southern Coke, No. 2	11.85 @ 12.10
Southern Coke, No. 3	11.10 @ 11.35
Southern, No. 1, Soft	11.85 @ 12.10
Southern, No. 2, Soft	11.10 @ 11.35
Tennessee Charcoal, No. 1	16.00 @ 16.50
Alabama Car Wheel	18.25 @ 18.50
Jackson County Silvery	16.50 @ 17.00
Other Ohio Silvery	15.00 @ 15.50

While there is a little more metal moving, the condition of the Pittsburg Pig Iron market is far from being a satisfactory one to makers. As is well known, there are large stocks of Iron on hand there and in the Mahoning Valley as well, and with the recent increase in production it will take just so much longer to clean this stock up. Quotations are given as:

No. 1 Foundry	$12.50 @ $13.00	cash
No. 2 Foundry	11.50 @ 12.00	"

In Southern markets the volume of business in Pig Iron has been comparatively small during the week. The Iron Pipe works, having previously supplied their wants for a long time, have not been in the market and consumers did not want much, but stove works and agricultural works have bought to a fair extent, and although their orders seldom reached 1000 tons in any one instance, yet in the aggregate they were larger than usual of late, but no better prices were realized. In fact, the tone of the market is easier, for purchases are being made for the first half of next year at the same rates as current for spot delivery. No. 1 Foundry is especially weak, there being little demand for that grade, and sales have been made as low as $9.50 ℔ ton, f.o.b. Birmingham. The other grades are well sustained, there being a fair demand for No. 2 Foundry. The trade contends that the outlook, from a statistical point of view, is more favorable and that there should be an early improvement in prices, but as long as buyers can supply their wants at the current low rates they pay little attention to sentimental views. Quotations are as follows:

Southern Coke, No. 1	$12.25 @ $12.50
Southern Coke, No. 2	10.75 @ 11.00
Southern Coke, No. 3	10.25 @ 10.50
Ohio Soft Stone Coal, No. 1	15.50 @ 16.00
Ohio Soft Stone Coal, No. 2	14.50 @ 14.75
Lake Superior Coke, No. 1	15.00 @ 15.25
Lake Superior Coke, No. 2	14.00 @ 14.25
Hanging Rock Charcoal, No. 1	18.50 @ 19.00
Hanging Rock Charcoal, No. 2	17.50 @ 18.00
Tennessee Charcoal, No. 1	14.00 @ 14.25
Tennessee Charcoal, No. 2	13.00 @ 13.25
Standard Southern Car Wheel	17.75 @ 18.00
Lake Superior Car Wheel and Malleable	17.00 @ 17.25

Metal Market.

Pig Tin.—Prices have been moved a little higher, or to 20.65¢ @ 20.70¢ for present or next month delivery. Comparatively little Tin has changed hands in a speculative way, however, and regular consumptive movement is believed to have been below the average for the season. The turn for the better in prices, as a matter of fact, has the appearance of being what may be termed a nicely timed natural reaction, engineered by some few prominent operators, with nothing more substantial behind the manoeuver than the fact that this market is still a good deal below the level of Europe. "Short" interest in the speculative branch of the market here seems to have been pretty well eliminated, and the outside holdings are believed to be comparatively small. Several hundred tons of Pig Tin have been shipped to this port from Europe during this month, the largest portion of which will go into bond pending the coming tariff changes. Jobbers report a strictly routine demand, confined to present requirements. Quotations for small lots are unchanged at 22½¢ for Banca and 21½¢ @ 22¢ for Straits Pig.

Copper.—Regarding the alleged late sales of Ingot by the Calumet & Hecla Company, no official information is imparted, but facts came out from outside sources going to show that about 5,000,000 lb were disposed of to exporters and that the price was 9¾¢ ℔ lb. Rumor has it that sales have also been made to home consumers at similar

price, with deliveries running up to March 1, if not further ahead, and that some business has been done at 10¢. The latter price is now bid for round lots and most sellers have advanced their limits to about 10¼¢. Toward the close of the week bids were made on the Metal Exchange of as high as 10.15¢ for December and 10.25¢ for January and February deliveries of Lake Superior Ingot. The market shows something of substantial firmness in this product, but the cheaper varieties of Copper merely hold their own in price, with but ordinary sales. Better inquiry is noted by jobbers for Ingot Copper, and sales have made a rather better showing during the week. Quotations for small lots remain unchanged.

Sheet Copper.—An increase in inquiry for Sheet Copper is noted during the past week, particularly for forward deliveries. Dealers are not, however, inclined to close much beyond spot sales just now nor to contract far ahead at present prices, believing that they have reached bottom figures, and that an upward movement is more than likely to occur before long. Stocks in consumers' hands are believed to be extremely low throughout the country, and it is thought that with anything like a return to normal conditions a satisfactory business should develop after the holidays. Prices are inclined to harden in sympathy with the advance in Ingot, although list prices for Manufactured Copper remain unchanged in the Eastern market.

Pig Lead.—Sales have been reported here to the extent of about 750 tons common domestic for delivery during the balance of the year. Some lots went at 3.40¢ for November, but the greater portion of the business was in December delivery at 3.42½¢ @ 3.45¢. At this writing the offering is moderate, and while consumers manifest extreme indifference, the demand from other quarters, along with more or less reserved offering, serves to keep the market quite firm in tone. Jobbers report the consumptive demands as extremely languid, nor is any substantial revival looked for this year either in Pig or Manufactured Lead. Prices for small lots are, meanwhile, firmly maintained at last week's quoted rates.

Spelter.—The purchases of this metal have been confined chiefly to single carloads at about 3.70¢ for ordinary Western brands deliverable here during the next six weeks. In volume the business was moderate and the demand was very tame. It is stated, however, that very few smelters will take orders at current prices, stating that their probable output for the balance of the year is closely sold up and that present prices leave no margin of profit. Hence 3.80¢ is asked for January and later deliveries, although moderate quantities have been closed out for earlier delivery at the price above quoted. Jobbers' rates for moderate retail quantities rule at 4¼¢ @ 4¾¢ for ordinary Western Spelter, with the usual advance on special brands.

Antimony.—Dealings have been on a very moderate scale, yet the demand remains sufficient to maintain a fair degree of steadiness in prices.

Tin Plate.—The most marked feature of the Tin Plate market has been a fairly active demand for 100 lb Ordinary Cokes for delivery during the first half of next year. Enough was done in this line to bring about a pretty good volume of business. Interest in futures does not, however, by any means come up to the average for this season of the year. Spot dealings have been moderate, and prices in no case show any quotable improvement. Still they are firm enough to warrant the conviction expressed by many authorities in the trade that absolute rock bottom has been touched, at any rate for this season, and that, therefore, any future movement will be in an upward direction. Stocks in the hands of consumers and retail dealers are known to be of the narrowest description. Consumers are only purchasing according to their necessities, and are entirely disinclined to anticipate their requirements to any extent until the trend of tariff legislation in the matter of Tin Plates is assured. For these reasons a big revival of interest is looked for so soon as importers, producers and buyers know exactly what are the new conditions to which they will have to adapt themselves. When such assurance is obtained the return of good business is looked for. But for the rest of the year nothing more lively than the present perfunctory trade is generally expected. Importers' orders for shipment are believed to have been somewhat larger latterly; but the receipts from the other side for some months have been very much below the average, importing merchants having been influenced by the same conservative sentiments operating with the consumers. As a result, jobbers complain of a difficulty in obtaining prompt filling of assorted orders, and much hunting from place to place has marked the trade of late.

Sheet Iron.—The immediate requirements of consumers of Galvanized Iron have been apparently filled to a large extent, and as the output has somewhat increased the market for this material shows greater ease. Stocks are being replenished, and there is, therefore, now less risk of any famine. Prices are, if anything, firmer. Black Iron is extremely dull. Mills have in several instances arranged for the placing of their whole output well into next year, and consequently jobbers find little interest being taken in this material. Prices are nominally firm, but spot cash or other inducements might secure concessions on quoted rates from the majority of dealers.

Chicago Report.

Scrap.—The consumption of Old Material continues to increase, as idle Iron works get into operation. Scrap Steel is the only commodity in this line that is wholly neglected. Dealers furnish the following list of buying prices, Chicago delivery:

	Per net ton.	Per lb
No. 1 Wrought Scrap	$7.00	....
Machinery Cast	7.00	....
Malleable Cast	6.00	....
Stove Plate (free of burnt)	5.00	....
Burnt Iron and Grate Bars	3.50	....
Sheet Iron and Hoops	2.00	....
Plow Steel and Breaking Stock	5.50	....
No. 2, such as Shovels, Hoes, &c	4.00	....
Old Boilers—whole (Iron)	4.00	....
" (Iron)—cut in single Sheets and Rings	6.00	....
Old Gas-Pipe and Boiler Tubes	5.00	....
Cast Borings	3.25	....
Turnings	4.00	....
Horseshoes	8.00	....
Copper Bottoms	....	5 ¢
Copper Clips and Heavy	....	7 ¢
Heavy Brass	....	5½¢
Light Brass	....	3½¢
Pipe Lead	....	2½¢
Tea Lead	....	2 ¢
Zinc	....	2 ¢
Rubber	....	4 ¢

Anthracite. — Some weakness in prices had begun to develop in this market under the influence of very mild weather, but it speedily changed when a severe cold spell set in throughout the Northwest and at the same time a formidable strike took place on the Lehigh Valley Railroad, threatening to curtail the supply of coal. The market now is firm. Carload lots of 12 net tons or over are quoted as follows:

	Grate.	Egg, Sto. and Ch.
Chicago, Ill.	$5.85	$6.10
Milwaukee, Wis.	5.85	6.10
Kansas City, Mo.	9.05	9.30
Council Bluffs, Iowa	9.05	9.30
Lincoln, Neb.	9.20	9.45
Sioux City, Iowa	9.05	9.30
Aberdeen, S. Dak.	9.10	9.35
Dubuque, Iowa	7.15	7.40
Madison, Wis.	7.35	7.60
St. Paul, Minn.	8.35	8.60
Burlington, Iowa	7.35	7.60
Des Moines, Iowa	8.80	9.05
Davenport, Iowa	7.15	7.40
St. Joseph, Mo.	9.05	9.30
Leavenworth, Kan.	9.05	9.30
Omaha, Neb.	9.05	9.30

Colorado Anthracite.

COLORADO FUEL & IRON COMPANY.

Denver	$8.00
Pueblo	8.00
Colorado Springs	8.00
Leadville	8.00
Cheyenne, Wyo.	10.00
All points between Denver and Missouri River	8.85

THE CONSOLIDATED LAMP & GLASS COMPANY, Pittsburgh, Pa., have just closed negotiations with the Fostoria Shade & Lamp Company, Fostoria, Ohio, for the purchase of their plant and business. Arrangements have also been made for the purchase of the business of the Wallace & McAfee Company, Limited, Pittsburgh.

THIS WEEK two Sheet mills at the plant of the Ætna-Standard Iron & Steel Company, Bridgeport, Ohio, will be laid off, and other departments will be closed down unless an agreement is reached with the Amalgamated Association on the wage scale governing Sheet mills.

CONDITION OF THE

Hardware Trade.

AS the latter part of November usually witnesses a diminution in the volume of trade it is not a matter of surprise that at the present time there is no increase in business. It is, however, a matter of congratulation that there is little, if any, falling off, trade being characterized by a fair activity in view of all the circumstances. There is certainly a better feeling prevalent and more confidence in the early resumption of a normal activity. The policy pursued by merchants of limiting their purchases to early requirements is still adhered to, and with perhaps nearly as much conservatism as during the past few months. Stock orders are given sparingly, but dealers are purchasing frequently with a view to completing their assortments, being content, however, in nearly all cases to carry less goods than usual. Prices are without important change, the market being fairly steady with the exception of some staple goods, such as Nails and Wire, in which there is a perceptible downward tendency. The financial condition continues to improve, and it is pleasant to note that comparatively few failures are reported. There was some apprehension a few months ago that the condition of business and the financial stringency would result in a good many failures in the trade, and perhaps among retail merchants, but fortunately these fears have not been realized, and with the lapse of time there is less to apprehend in this regard.

Advices from Chicago.—The Shelf Hardware jobbers report business to have improved a little during the past week, owing to the prevalence of cold weather throughout the Northwest, but it is still much under the normal volume. Merchants are fairly well stocked now on seasonable goods, and their orders are only small and evidently to cover sudden calls. Importers of Tin Plates represent their trade interfered with to an increasing extent by domestic Tin Plates, which are not only offered at lower prices, but on which better terms are given than customary in the importation of such goods. The movement is confined to small lots, but there is a fairly steady trade, in business of that character. Heavy Hardware jobbers are having a better demand in their line, not only in Iron and Steel, but also in winter goods. Material for bob sleds and other seasonable articles has been moving much more freely during the last ten days than at any previous time this fall. Collections are quite fair.

Notes on Prices.

Wire Nails.—The downward tendency in the prices of Wire Nails, which has been perceptible for some time, still continues, and on round lots at mill the market is represented by the quotation of $1.15 to $1.20. Some of the mills are holding to the latter figure, but there is little difficulty in placing attractive orders at the lower price named. In view of the desire of manufacturers to book orders and the active competition which prevails among them, relatively low prices are made on comparatively small lots, and a good proportion of the business consists of orders from the smaller jobbers and large retailers. The volume of business is only fair, but most of the mills are kept moderately busy. Small lots from store in New York are quoted at $1.55 to $1.60.

Advices from Chicago.—Business in Wire Nails is moderately active outside of Chicago, but not so much has been done in the city during the past week. Manufacturers are trying to hold the market at $1.30 to $1.32½, Chicago. But these prices have been shaded by some of their competitors, who seem to possess special facilities in low transportation rates. Jobbers quote small lots from stock at $1.45 to $1.50.

Cut Nails.—The Cut Nail market shows but little change during the past few weeks, the volume of business remaining moderate and prices pretty evenly maintained on a basis of 95 cents for carload lots at mill. This quotation is not, however, rigidly adhered to and prices have reached a point where some of the mills are not netting over 90 cents. The market in the West seems to be on the whole in a better condition than in the East and prices are more firmly maintained. In view of the unsettled condition of business some of the mills are not in operation, but there is on the whole a larger production of Nails at the present time than for some months. Small lots from store in New York are quoted at $1.20.

Advices from Chicago.—A continued good movement is reported in Cut Steel Nails, the best trade being, as heretofore, with points in the South west, now accessible by very low rates. These rates will run until early in December, and meantime the merchants o that section are stocking up heavily. Very good sales are also being made in the Western section of the country, especially in localities which can be reached by water from Wheeling. Prices on factory lots now run from $1.15 to $1.20, Chicago, according to the character of the order. Small lots from stock are selling at $1.30.

Barb Wire.—The demand for Barb Wire continues only moderate and the market is described as sluggish. Quotations are somewhat irregular and are represented by $2.15 to $2.20 for carload lots of Four-Point Galvanized at mill, the former figure being more readily obtainable than a week ago.

Advices from Chicago.—Trade in Barb Wire has not shown any increase since last report, but the demand seems to be fairly steady within the contracted lines that have prevailed for so long. The demoralization in prices reported in other parts of the country has not yet reached this locality, probabably because the orders coming up are not large enough to make it an object to cut prices in order to capture trade. The center of disturbance recently seems to have been in the South. Prices on factory lots of ordinary Galvanized Wire continue at about $2.40; carload lots of Glidden, Waukegan and Baker Perfect are selling at $2.50. Small lots from stock continue to be quoted at $2.55, but jobbers are doing but little in consequence of the increasing efforts of manufacturers to take the retail trade.

Market Wire.—The market on Plain Wire is suffering with other lines and lower quotations are developed. The greater part of the business is done at net prices instead of list and discount, and figures are being quoted which are lower than ever before. The decline in the price of the raw material contributes largely to this result, as does also the active competition between producers.

Cordage.—The Cordage market is quiet and the demand light. Prices, in sympathy with lower quotations on Hemp, have recently been tending downward, and are now quotably lower than a few weeks ago. It is reported that pure Manila Rope has been sold recently and is still obtainable at 7⅛ cents per pound. Sisal also has touched 5¼ cents a pound, and in round lots is also obtainable at this price. The market is thus represented by the following prices for large lots, f.o.b. factory or New York, the prices given being subject to a discount of 1½ per cent. for cash:

	Per pound. Cents.
Manila, 7-16 in. diam. and larger	7¼
" ⅜ in	8
" ¼ and 5-16 in	8½
" Tarred Rope	7
" Hay Rope, Medium	7½
Sisal, 7-16 in. and larger	5¼
" ⅜ in	5¾
" ¼ and 5-16 in	6¼
" Hay Rope	5¼
" Tarred Rope	4¾
" Medium Lath Yarn	5
New Zealand, 7-16 in. and larger	5¼
" ⅜ in	5½
" ¼ and 5-16 in	6
" Hay Rope	5¼
" Tarred Rope	4¾

Glass.—During the past week the Plate Glass Manufacturers' Association having the central selling agency at Pittsburgh was dissolved, and the selling agency was abolished. Window Glass factories continue to start up, the present capacity being equal to 785 pots, as against 182 pots reported in our issue November 2. The demand is not brisk, and it is reported that card rates have been shaded very materially, especially where money was necessary for factories to meet obligations. At the present time there appear to be no available quotations on any kind of Glass which would hold good under all circumstances.

Old Metals.—But little improvement is manifest in the market for Old Metals, and prices show as yet no upward tendency. Scrap Iron, however, commands a little more attention, although the demand is still very light. During the last few days inquiries are said to have come in more freely, and for certain lines a somewhat more improved demand is reported to exist. Purchases are, however, almost invariably in very moderate quantities for the supply of pressing requirements only. Quotations, New York delivery, are as follows :

Heavy Copper	℔ lb 6⅜¢
Light and Tinned Copper	℔ lb 6¼¢
Heavy Brass	℔ lb 5¼¢
Light Brass	℔ lb 4½¢
Lead	℔ lb 3¢
Tea Lead	℔ lb 2½¢
Zinc	℔ lb 2½¢
No. 1 Pewter	℔ lb 14¢
No. 2 Pewter	℔ lb 6¢
Wrought Scrap Iron....℔ gross ton	$9.00 @ $10.00
Heavy Cast Scrap.....℔ gross ton	9.00 @ 10.00
Stove Plate Scrap.....℔ gross ton	.... @ 5.60
Burnt Iron (delivered at mill) ℔ gross ton	.... @ 5.00

Old Rags, Paper, &c.—Business has taken a somewhat better turn in the market for Old Rags, Paper, &c. More activity is noted in the demand for Paper stock than has been the case for some months. Yet the trade is still far below its average level, and no return to normal conditions is looked for much before the first of the year. Western paper mills are busy, and the majority of those in the East are picking up again. Prices show little change from those quoted last week, as follows:

No. 1 White Rags	℔ lb 3¼ @ 3½
No. 2 White Rags	℔ lb 2¼ @ 2½¢
Mixed Rags	℔ lb ¾¢
Blues and 3ds	℔ lb 1 @ 1¼¢
Hard Sized White Shavings	℔ lb 2¼ @ 2½¢
No. 1 White Book Shavings	℔ lb 2 @ 2⅛¢
No. 2 White Book Shavings	℔ lb 1 @ 1⅛¢
Light Book Shavings	℔ lb ¾¢
No. 1 Mixed Shavings	℔ lb ¾ @ 1 ¢
No. 2 Mixed Shavings	℔ lb ½ @ ¾¢
No. 1 Printed Books	℔ lb 1 @ 1¼¢
Ordinary Mixed Books	℔ lb ½ @ ¾¢
Newspapers	℔ lb 3-5¢
No. 1 Manila Paper	℔ lb 1 @ 1¼¢
No. 2 Manila Paper	℔ lb ⅝ @ ¾¢
Bogus Paper	℔ lb ½¢
Common Paper	℔ lb ⅜ @ ½¢
Straw Chips	℔ lb ½ @ ⅝¢
Binders' Clippings	℔ lb ½ @ ⅝¢
Jute Butts	℔ lb 1⅞ @ 2 ¢
No. 1 Jute Bagging	℔ lb 1 @ 1¼¢
Mixed Bagging	℔ lb ¾ @ 1 ¢
No. 2 Bagging	℔ lb ½ @ ¾¢
Hemp Twine	℔ lb 2¼¢
Manila Rope	℔ lb 2½¢
Jute Rope	℔ lb 1½ @ 1¾¢
Mixed Rope	℔ lb ¾ @ ⅞¢

Old Rubber.—The market for Old Rubber presents no features of interest. Prices continue low, being about as follows in New York:

Car Springs, ton lots, ℔ lb.	.... @ $0.03¼
Rubber Shoes, carloads, delivered at factory, ℔ lb.	.... @ .03
Rubber shoes, less than carloads, ℔ lb	0.02¼ @ .03⅛
Large Hose, ℔ ton	.... @ 9.00
White Wringer Rolls, ℔ lb.	.... @ .04¼
White Syringes, ℔ lb	.... @ .05

BOAS BROS., 233-235 Greenwich street, have ceased to sell their Adamant Enameled Ware on joint agreement with Lalance & Grosjean Mfg. Company and St. Louis Stamping Company. This line of goods is of German manufacture.

Trade Notes.

THE MICA MFG. COMPANY, 89 Fulton street, New York, issue a folder describing some of the specialties in mica of their manufacture. One page gives illustrations of Mica Canopies for gas globes of various patterns. There are also Mica Canopies for lamp chimneys, Smoke Bells, Protectors for silk shades &c. Among other special goods are Mica Screens, Argand Chimneys and the like. A very large variety of goods are illustrated and described and particulars of price and sizes are given. This firm likewise sell Mica by the sheet, and in the circular a price-list of Mica in this form is given.

TINNERS' MACHINERY & SUPPLY COMPANY, 9 Cliff street, New York, distribute a circular illustrating and describing the Excelsior Patent Oval Former. A full account is given of this tool, which is made with 2 inch rolls and 1¾ inch rolls, both sizes being 31 inches long. On the back of the circular are testimonials from very prominent sheet metal workers, who refer to the excellent work of this Oval Former.

NINETY TONS of Black and Galvanized Sheets are kept out of the market each day in consequence of the recent destruction by fire of the plants of the Irondale Steel & Iron Company, Anderson, Ind, and the Whittaker Iron Company, Wheeling, W. Va.

A COMPANY has been formed and active steps taken toward the erection of a Sheet mill plant near Saltsburg, Pa., to consist of four light mills. A. Gourley, superintendent of P. H. Laufman's Sheet mills, at Apollo, Pa., is the leading spirit in the enterprise.

J. W. FISKE, 39 and 41 Park place, New York, has recently manufactured for the Hotel Waldorf a number of Iron Vases to contain flowers, shrubs, &c., to be placed around the building just inside the street walks. They have been made from special designs, and are not to be sold to any other hotel in this city. The vase represents an acorn cut in two horizontally, this emblem being a portion of the Astor coat of arms. The acorn rests on the rustic stump of an oak tree. It is also made with a square base to set low.

THE fourth Sheet mill of the Cambridge Iron & Steel Company, Cambridge, Ohio, was put into operation last week. This mill had been idle many weeks in consequence of dullness in the market. Revival of trade in Galvanized Sheets caused its resurrection. This company now have two galvanizing pots running steadily.

J. P. TURNER, 40 and 49 Cortlandt street, New York, who puts up Lightning Rods of all kinds, also Weather Vanes, Bannerets, Finials, &c., says he has no cause for complaint as regards trade. He is busy at present with a dozen houses in a North River town, and will commence on a large hospital in Elizabeth, N. J., at once, in addition to other work in hand. Among some satisfactory contracts just finished he mentions the Lightning Rod equipment for the two power houses and tall chimneys of Third Avenue Cable Road in this city. Edison Building in Newark and a cathedral in Jersey City, N. J.

P. W. SMITH, an English manufacturer recently arrived in this country, has, it is announced, leased the long abandoned Champion Saw Works, at Beaver Falls, Pa., where he will start an enameling works for the production of Enameled Steel House Decorations.

THE TINWARE FACTORY of Bridgeport & Co., Louisville, Ky., was burned recently. The loss was $60,000, covered by insurance to the extent of $45,000.

THE SALEM MINERAL WOOL COMPANY, Salem, Va., have erected a new factory in place of the one destroyed by fire last year.

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Metal and Miscellaneous Prices.

CHICAGO, NOVEMBER 23, 1893.

Tin—

Straits pigs.....23¢

Imported Tin Plates—

Charcoal Plates.—Bright.

Guaranteed Plates command special prices, according to quality.

		Per box.
Calland and Melyn Grade	IC, 10 x 14	@ $6.75
	IC, 12 x 12	@ 6.75
	IC, 14 x 20	@ 6.75
	IC, 20 x 28	@ 13.50
	IX, 10 x 14	@ 8.75
	IX, 12 x 12	@ 8.75
	IX, 14 x 20	@ 8.75
	IX, 20 x 28	@ 17.50
	DC, 12½ x 17	@ 6.50
	DX, 12½ x 17	@ 8.50
Allaway Grade	IC, 10 x 14	@ 6.50
"	IC, 12 x 12	@ 6.50
"	IC, 14 x 20	@ 6.50
"	IC, 20 x 28	@ 13.00
"	IX, 14 x 20	@ 8.00
"	IX, 20 x 28	@ 16.00

Coke Plates—Bright.

	Per box.
Steel Coke—IC, 10x14, 14x20.	$5.75 @$5.85
IC, 14x20.90 ℔	5.50 @ 5.60
IC, 14x20, 100 ℔	@ 5.85
10 x 20	8.75 @ 9.00
20 x 28	11.50 @12.70
X, 10x14, 14 x 20	@ 7.35
B.V. Grade. IC, 10x14, 14x20.	5.85@ 6.00

Charcoal Plates.—Terne.

Guaranteed Plates command special prices, according to quality.

Mansel and Dean Grades.— IC. 14 x 20	@ $5.62½
20 x 28	@ 11.25
IX. 20 x 28	@ 14.25
Worcester Brand and equal.— IC, 14 x 20	6.12½@
IC, 20 x 28	12.25 @
IX, 14 x 20	7.62½@
20 x 28	15.25 @

American Tin Plates.

Charcoal Plates.—Bright.

Irondale, A. A.—	IC, 14 x 20	$7.00
" "	IX, 14 x 20	9.00
" "	IXX, 14 x 20	11.00
" "	IC, 20 x 28	14.00
" "	IX, 20 x 28	18.00
" "	IXX, 20 x 28	22 00

Florence.—

IC, 10 x 14, 12 x 12, 14 x 20	$6.75
IX, 10 x 14, 12 x 12, 14 x 20	8.50

Palma.—

IC, 10 x 14, 12 x 12, 14 x 20	$7.25
IX, 10 x 14, 12 x 12, 14 x 20	9.25

Each extra cross $2.00 and 20 x 28 double these prices.

Brilliant, Tissue Packed, IC, 14 x 20	$9.25
Royal ,extra, IC, 14 x 20	7.25
Merlon, IC, 14 x 20	7.00
Almond, IC, 14 x 20	6.50
Mint, IC, 14 x 20	6.25

Coke Plates.—Bright.

Elwood.—IC, 14 x 20	$6.00
" IC, 20 x 28	12.50

Roofing Plates.

Arch, IC, 20 x 28	@$11.75
Crescent, IC, 20 x 28	@ 12.25
Crescent, IX, 20 x 28	@ 15.25
Empire, IC, 20 x 28	@12.50
Empire, IX, 20 x 28	@15.50
Hickory, IC, 20 x 28	@ 12.75
" IX, 20 x 28	@ 15.75
Alaska (heavily coated), IC, 20x28	@$14.50
Alaska IX, 20 x 28	@ 17.75
Special, IC, 20 x 28	@ 15.50
" IX, 20 x 28	@ 18.50

Merchant's Roofing (extra coated), IC, 20 x 28 @$17.75

Merchant's Roofing (extra coated), IX, 20 x 28 @$21.50

Merchant's Old Method, (extra heavily coated), IC, 20 x 28 @$19.75

Merchant's Old Method (extra heavily coated), IX, 20 x 28 $23.60

Irondale A : IC, 14 x 20	$6.25
IX, 14 x 20	7.75
IC, 20 x 28	12.50
IX, 20 x 28	15.50
Westmoreland : IC, 14 x 20	$6.25
IC, 20 x 28	12.50
Elwood : IC, 20 x 28	$12.00
Juno : IC, 14 x 20	$5.75
IC, 20 x 28	11.50
Illinois, Old Method : IC, 20 x 28	$17.00
E. L.: IC, 20 x 28	$12.50
Jessie : IC, 20 x 28	$12.00

Scott's Extra Coated, Stamped and Resquared, IC, 14 x 20	$9.50
Scott's Extra Coated, Stamped and Resquared, IX, 14 x 20	11.00
Scott's Extra Coated, Stamped and Resquared, IC, 20 x 28	19.00
Scott's Extra Coated, Stamped and Resquared, IX, 20 x 28	22.00
Neville, Stamped, IC, 14 x 20	6.25
" " IX, 14 x 20	7.50
" " IC, 20 x 28	12.50
" " IX, 20 x 28	15.00
Taylor's Old Style, IC, 14 x 20 (Stamped and Resquared)	$9.50
Taylor's Old Style, IC, 20 x 28 (Stamped and Resquared)	19.00
Taylor's Roofing, IC, 14 x 20 (Stamped and Resquared)	8.25
Taylor's Roofing, IC, 20 x 28 (Stamped and Resquared)	16.50
Columbia, IC, 14 x 20 (Stamped)	7.25
" IC, 20 x 28 (Stamped)	14.50
Maple, IC, 14 x 20 (Stamped)	6.75
" IC, 20 x 28 (Stamped)	13.50
Willow, IC, 14 x 20	6.50
" IC, 20 x 28	13.00
Knoxall, IC, 14 x 20	6.25
" IC, 20 x 28	12.50
Globe, IC, 14 x 20	6.00
" IC, 20 x 28	12.00
Miami, IC, 14 x 20	6.00
" IC, 20 x 28	12.00
" IX, 20 x 28	15.00
" (Redipped), IC, 20 x 28	17.00

Tin Boiler Plates.

	Per box of 100 sheets.	Per box of 112 sheets.
X, 14 x 28	$13.00	$13.00
XX, 14 x 28	14.50	14.50
X, 14 x 31	14.50	15.80
XX, 14 x 31	16.50	17.50
X, 14 x 56	29.50	16.50
XX, 14 x 56	32.50	18.20
X, 14 x 60	31.50	17.65
XX, 14 x 60	35.50	20.90

Sheet Iron—

Black.

Nos.	Common American	Refined.
10 to 16	₩ ℔ 2 6-10¢	3 2-10¢
17 to 20	₩ ℔ 2 7-10¢	3 3-10¢
21 to 24	₩ ℔ 2 8-10¢	3 4-10¢
25 and 26	₩ ℔ 2 9-10¢	3 5-10¢
27	₩ ℔ 3¢	3 6-10¢

Russia, Planished, &c.

Genuine Russia, all numbers....13¢ net.
Patent Planished....₩ ℔ A, 10¼¢; B, 9½¢ dis. 5%
Craig's Polished Sheet Steel.....8½¢

Galvanized.

Juniata or first quality.....dis. 70&5%

Copper—

Ingot.

Lake.....11¾¢ @ 12¼¢
Casting Brands.....11¢ @ 11⅝¢

Sheet and Bolt.

Discount, 25%.

Copper Bottoms.

Discount, 25%.

Seamless Brass and Copper Tubes.

Base price, 17½¢, Chicago, with extras according to size.

Copper, Bronze and Gilding Tube, 3¢ ₩ ℔ additional.

Brazed Brass Tubing.
(To No. 20 inclusive.)

Add freight from New York to Chicago to these prices, or 50¢ ₩ 100 ℔.

Above 5-16 inch to 3 inch inclu	35¢
Plain, above 3 inch	45¢
Plain, 5-16 inch	45¢
Plain, ¼ inch	60¢
Plain, 3-16 inch	$1.00
Plain, ⅛ inch	$1.50
Fancy Tubing, Brass, to No. 20 incl	43¢ ℔
Bronze Tubing, 3¢ ₩ ℔ more than Brass	

40 & 45% @

Roll and Sheet Brass.

Discount, 35 @ 40%.

Slab Spelter—

Western Spelter.....5

Sheet Zinc—

600 ℔ casks.....5 ¢
300 ℔ casks.....5½¢
Loose sheets.....5½¢

Lead—

Soft Pig Lead.....4¢
Bar.....4½¢
Pipe.....5½¢, dis. 10¢
Block Tin Pipe.....35¢
Sheet.....6¢, dis. 10%

Solder—

⅛&⅙.....12¾¢@13¼¢
Extra Wiping.....11½¢

The prices of the many other qualities of Solder in the market indicated by private brands vary according to composition.

Antimony—

Cookson.....12¢@12¼¢
Hallett's.....11¼¢@11⅝¢

Wrought-Iron Pipe—

List on following page.

1¼ and under, Plain	57½&10%
1¼ and under, Galv	50½&10%
1½ and over, Plain	67½&10%
1½ and over, Galv	57½&10%
Boiler Tubes, list Oct. 24, 1892	65@67½%
Casing, list Nov. 16, 1892	52½%
Inserted Joints Casing, list Nov. 16, 1892	47½%
Steel Boiler Tubes	27½%
Cold Drawn Seamless Steel Tubing	50%

Cast-Iron Soil Pipe—

Cast-Iron Soil Pipe, Tarred; sizes 2 to 6 inches, inclusive.....dis 70&2½%
Other sizes.....dis 60%

Leader Pipes—

Abendroth's Galv. Spiral Riveted	60%
Austin's Corrugated	60%
Gordon & Gilbert's Corrugated	60%
Ritchie's (Galv. Iron only) Cor'd	60%
Ritchie's Spiral Lock Seam, Galv'd	55%
Austin's Spiral Ribbed Pipe	60%
Plain Adjustable Elbows	60%
James A. Miller Bros. (Galv'd Iron only) Corrugated	60%

Furnace Fittings—

Discount from Excelsior Steel Furnace Co.'s list.....50%

Steel Roofing—

Perfection.....$3.75 square
Climax.....$3.50 square
The Lloyd Spanish Tiling.....$4.50 square

Metallic Shingles—

Cushman's.....$1.25 square
Merchant & Co.'s Spanish Tiles :

Copper, 14 oz.	$36.00 square
Tin	$9.75@$14.25 square
Steel, painted	$9.00 square

Drain Pipe—*Tile.*

Discount from list..... 70%

Paints Oils, &c.—

Deodorized Benzine	7½@8 ¢
Iron Paint, Bright Red	₩ ℔, 2 ¢
" " Brown	₩ ℔, 1¾¢
" " Purple	₩ ℔, 2½¢
" Ground in oil, B. Red	₩ ℔, 6½¢
" Ground in oil, Red	₩ ℔, 6½¢
" Ground in oil, Brown	₩ ℔, 5½¢
" Ground in oil, Purple	₩ ℔, 6 ¢
Linseed Oil, Boiled, in bbls	40¢
Linseed Oil, Raw, in bbls	37¢
Mineral Paints	2@4¢
Orange Mineral	10¾¢
Pure White Lead in Oil	6¾@7¼¢
Dry White Lead in bbls	6½@6¾¢
Red Lead, American	7@7½¢
Red Venetian, English, dry	$1.65@$1.70
Red Venetian in oil; asst'd cans, kegs	8½¢ ; 7½¢
Sipe's Japan Oil, in bbls, ₩ gal	34¢
Spirits Turpentine, in bbls., ₩ gal.	35½¢
Asphaltum, Trinidad Refined, ₩ ton	$45
Tarred Felt, 1 Ply, ₩ 100 ℔	$1.60
Tarred Felt, 2 Ply, ₩ roll 108 sq. feet	$1 25
Tarred Felt, 3 Ply, ₩ roll of 108 sq. feet	$1.70
Roofing Pitch, ℔ bbl. of 300 ℔	$3.00

NEW YORK, NOVEMBER 24, 1893.

The following quotations are for small lots.

Aluminum—

No. 2 Grade Metal, in ton lots..₩ ℔, $0.75
No 1 (guaranteed to be 98 % pure and over), in ton lots .....₩ ℔ .90
Lots less than 1 ton, 10¢ ₩ ℔ additional.

Antimony—

Cookson .....₩ ℔, 11¢
Hallett's.....₩ ℔, 10¼¢@10½¢

Brass—

Planished.....net
Roll and Sheet.....35@40%

Brass and Copper Tubes

Brazed Brass Tubing—

List May 20, 1889.

	Per ℔.
Plain, to No. 20 inclusive, above 5-16 inch to 3 inch inclusive	$0.35
Plain, to No. 20, above 3 inch	45
Plain, 5-16 inch to No. 20	45
Plain, ¼ inch	60
Plain, 3-16 inch	1.00
Plain, ⅛ inch	1.50
Fancy Tubing to No. 20, inclu	43

35@40% @

Copper and Bronze Tubing—

3¢ ₩ ℔ more than brass.

Bronze, Tobin—

Drawn Rods for Bolts, Forgings, &c

Over ¼ to 3½ inches inclusive....17¢ ₩ ℔
Over 3½ to 5 inches inclusive.....18¢ ₩ ℔

Piston Rods, Finished True, Smooth and Straight.

Over ¼ to 3½ inches inclusive....18¢ ₩ ℔
Over 3½ to 5 inches inclusive.....19¢ ₩ ℔

Clips—

Buffalo Damper: Nos. 1, $1.25; 2, $2.50 per doz.....40&10%

Conductors—

Corrugated. *Round or Square—*

Galvanized.....60%
Galvanized, Locked Joints.....60%
Tin.....60%

Spiral Riveted—

Galvanized 50%

See also *Elbows and Shoes; Eave-Trough Miters; Strainers, Conductor.*

Conductor Strainers—See *Strainers, Conductor.*

Copper—

Bottoms, Pits and Flats....25@25&5%

Ingot.

Lake.....11¢
Ansonia Grade Arizona.....10½¢
Ansonia Grade Casting.....10¢
Planished.....net
Sheet and Bolt.....25&25&5%

Tubes—See *Seamless Brass Tubes.*

Coppers, Soldering—

See *Irons, Soldering*, in Current Hardware Prices.

Damper Clips Buffalo—

See Clips, Buffalo Damper.

Eave Troughs—

Lap or Slip Joint, Galvanized.....60&10%
Lap or Slip Joint Terne.....60%

Eave-Trough Mitres—

Lap or Slip Joint.....list, net

Elbows—

Plain Adjustable—

Tin.....70%
Galvanized.....70%

Crimped Tubing—

Re-Tinned or Galvanized.....35%

Stove-Pipe—

Buffalo Four-Piece.

4½	5	5½	6	7 inch,
$0.78	.87	.90	.99	1.20 per doz..20 %

Elbows and Shoes—

Flat Crimp,

Tin.....35%
Galvanized 35%

Corrugated.

Flat Crimp.

Galvanized.....60%

Round or Square.

Tin.....60%
Galvanized.....60%

Iron, Sheet—

Black.

	Common American.	R. G. Cleaned American.
Nos. 10 to 16	₩ ℔, 2¾	3½¢
Nos. 17 to 20	₩ ℔, 3	3⅝¢
Nos. 21 to 24	₩ ℔, 3	3⅝¢
Nos. 25 and 26	₩ ℔, 3½	3¾¢
No. 27	₩ ℔, 3¼	3⅝¢
No. 28	₩ ℔, 3⅜	3¾¢
American B. B.	₩ ℔, 4¢@4½¢	

Russia, Planished, &c.

Genuine Russia, according to assortment.....₩ ℔, 11¾@12½¢
Patent Planished....₩ ℔, A, 10¢; B, 9¢, 5%
Craig Polished Sheet Steel.....₩ ℔, 8½¢

Galvanized.

Nos.	B. B.
10 to 16	70%@70& 2½%
17 to 22	
23 to 24	
25 to 26	
27	
28	
29 and 30	

Filter Joints—

Lee's..... 33⅓

Lead—

American Pig	4½¢@4¼¢
Bar	4½¢
Pipe	6¼¢, 20%
Tin Lined Pipe	15¢, 20%
Block Tin Pipe	37½¢, 20%
Sheet	7¢, 20%

Old Lead in exchange, 3¼¢ ₩ ℔.

Metal Expanded—

Manufacturers' list No. 5.

Lathing	10%
Fencing, Painted Sheets	20%
Netting, Painted Sheets	20%
Door Mats, Galvanized	25%
Window Guards, Paneled	15%
Tree Guards, Paneled	15%

Mitres Eave-Trough—See *Eave-Trough Mitres.*

Paints Oils &c.—

Lead, Amn. White, in oil	6¾ @ 7¼
Lead, Red, bbls. and ⅛ bbls	6½ @ 7
Lead, Red, kegs	6½ @ 7
Ocher, American	1 @ 1¼
Red, Venetian, American	1½ @ 2½

Linseed Oil:
Raw, ₱ gal..... @ .40
Boiled..... @ .43

Spirits Turpentine:
In bbls..... @ .32

Putty:
In barrels and ¼ bbls..... .01¾ @ .01¾
In tubs..... .01⅝ @ .01¾
In tin cans..... .01⅝ @ .02¼
In bladders..... .01⅞ @ .02¼

Roofing Material, &c.:
Asphaltum, Trinidad Refined, ₱ ton..... $30.00@$35.00
Asphaltum, Rock, ₱ ton..... $14.00
Coal Tar Felt, 1 Ply, ₱ ℔..... .2¢
Coal Tar Felt, 2 Ply, ₱ roll 108 sq. ft..... $1.42½
Coal Tar Felt, 3 Ply, ₱ roll 108 sq. ft..... $1.85
Roofing Pitch, ₱ bbl..... $2.25

Pipe, Drain 50%

Pipe and Fittings, Cast Iron Soil—

Cast-Iron Soil Pipe, Tarred, sizes 2 to 6 Inches, inclusive..... 60@60&10%
Other sizes..... 55@55&10%
Cast Iron Fittings, Tarred, sizes 2 to 6 inches..... 60@60&10%
Other sizes..... 55@55&10%

Pipe, Spiral—

Galvanized..... 60%
Tin..... 60%

Rock and Slag Wool—

	₱ ℔	₱ cub. foot
Slag Wool, ordinary	1¼	15¢
Slag Wool, extra	4¼	38½¢
Rock Wool, ordinary	2¼	27¢
Rock Wool, extra	7¼	42½¢

Rosin—

Cmono n and Good—Strained,
Rosin, C. & D..... ₱ bbl. $1.33@$1.35
Rosin, E. & F..... ₱ bbl. $1.45@$1.5
Rosin, G. & H..... ₱ bbl. $1.65@$1.85
Rosin, I. & K..... ₱ bbl. $2.25@$2.75
Rosin, M. & N..... ₱ bbl $3.30@$4.10

Seamless Brass Tubes..ne

Shoes and Elbows—See *Elbows and Shoes.*

Slate Roofing—

According to size, f.o.b. cars, Quarry Station.

Pennsylvania:
Best Bangor, ₱ sqr..... $3.25@$4.50
Pen Argyle, ₱ sqr..... 3.50@ 4.25
Peach Bottom, ₱ sqr..... 5.00@ 6.25
No. 1 Chapman, ₱ sqr..... 4.00@ 4.65
Lehigh Slates, ₱ sqr..... 3.00@ 4.50
Vermont:
Sea Green, ₱ sqr..... 2.70@ 3.20
Purple, ₱ sqr..... 3.50@ 4.50
Unfading Green, ₱ sqr..... 3.50@ 4.00
Red, ₱ sqr..... 9.75@12.00

Solder and Soldering Fluids—

Solder—

½ & ½..... 13½@14½¢
No. 1..... 11¾@12 ¢
Prices of Solder indicated by private brands vary according to composition.

Soldering Fluids—

Concentrated Soldering Flux.
f.o.b. New York.
n barrels, ₱ ℔..... 4¢
Smaller quantities, ₱ ℔..... 5¢

Gedney's Soldering Fluid.
(n carboys or barrels, ₱ ℔..... 2¢
$1.50 for carboy or barrel; money refunded when returned.

Perfection Soldering Flux.
No charge for package.
5 bbls., about 500 ℔, ₱ ℔..... 3½¢
½ bbls., about 300 ℔, ₱ ℔..... 4¢
Kegs, about 110 ℔, ₱ ℔..... 4¢
75¢ extra for keg.
Kegs, about 55 ℔, ₱ ℔..... 4¢ } 5% dis.

Yager's Soldering Salts.
½ ℔ bottles, each..... 30¢
Large quantities, per ℔..... 40¢

Spelter—

Western Spelter..... 4½¢@4¾¢
Bertha..... 8¼¢@9¢

Spiral Pipe—See *Pipe, Spiral.*

Stove-Pipe Elbows—*See Elbows, Stove Pipe.*

Stove Polish—See *Polish, Stove.*

Stove Trucks—See *Trucks, Stove.*

Strainers Conductor—

Galvanized..... 60%

Tin, Pigs and Bars—

Banca, pigs, ₱ ℔..... 22½¢
Straits, pigs, ₱ ℔..... 21½¢@22¢
Straits in bars, ₱ ℔..... 22½¢@23¢

Tin Plates—

American Terne Plates—

Alaska (re-squared) IC, 14 x 20..... $7.00
Alderly, extra quality, IC, 14 x 20..6.37½
Allegheny, IC, 14 x 20..... 6.12
" " IX, 14 x 20..... 6.38
Apollo Roofing, IC, 14 x 20..... 6.25
" " " IX, 14 x 20..... 7.25
Bonus, Extra Coated, IC, 14 x 20... 6.75
" " " IX, 14 x 20.... 8.25
Buckeye, IC, 14 x 20..... 7.00
" " IX, 14 x 20..... 8.25
Chicago, IC, 20 x 28..... 11.50
Central, IC, 14 x 20..... 5.37½
Climax, IC, 14 x 20..... 5.70
Columbia, IC, 14 x 20..... 7.00
Crescent, IC, 14 x 20..... 6.00
DeMill's First New York, IC, 14 x 20. 5.75
" First New Jersey, IC, 14 x 20 5.50
" Mohawk, IC, 14 x 20..... 5.50
Dunlap's Double Dipped, IC, 14 x 20 8.25
" " " IX, 14 x 20 9.50
" Domestic, IC, 20 x 28.....12.00
" " IX, 20 x 28..... 15.00
Empire, IC, 14 x 20 .....6.12½
Extra Central, IC, 14 x 20.....5.62½
Flag, IC, 14 x 20..... 5.50
Fort Pitt, IC, 20 x 28 .....11.00
Globe, IC, 14 x 20..... 5.75
Hamilton's Best Redipped, IC, 14x20 9.25
" " IX, 14x20 10.75
Hickory (Resquared), IC, 14 x 20..6.37½
Juno, IC, 14 x 20..... 5.75
Kensington, IC, 14 x 20 ..... 6.75
" IX, 14 x 20 ..... 8.00
Knoxall, IC, 14 x 20 ..... 6.00
Laufman's Apollo (Resquared), IC, 14 x 20 ..... 8.12
Laufman's Apollo (Resquared), IX, 14 x 20 ..... 9.37
Leominster, Extra Coated, IC, 14x20 7.75
Lion (Stamped), IC, 14 x 20..... 6.25
Lula, Best Charcoal, IC, 20 x 28....12.50
" " IX, 20 x 28....16.00
Manhattan, IC, 14 x 20 ..... 7.00
Maple, IC, 14 x 20 ..... 6.50
Merchant's Old Method (Resquared), IC, 14 x 20 ..... 9.50
Merchant's Roofing (Resquared), IC, 14 x 20..... 8.50
McKinley, IC, 20 x 28..... 12.00
" IX, 20 x 28..... 15.00
Neville, IC, 14 x 20 ..... 6.00
" " IX, 14 x 20..... 7.25
N. F. Old Style, IC, 14 x 20..... 7.50
" " " IX, 14 x 20..... 9.00
Old Colony, IC, 14 x 20..... 8.00
Optimus, Best Redipped, IC, 14 x 20 8.25
" " " IX, 14 x 20 9.50
Osceola, Hand Coated, IC, 14 x 20.. 8.25
" " " IX, 14 x 20.. 9.75
Palacio, IC, 14 x 20..... 5.55
Pennsylvania Old Method (Treble Coated), IC, 14 x 20..... 8.50
Phœnix, IC, 14 x 20..... 5.80
Scott's Extra Coated (Resquared), IC, 14 x 20 ..... 9.25
Scott's Extra Coated (Resquared), IX, 14 x 20..... 10.75
Taylor Old Style (Resquared), IC, 14 x 20..... 9.25
Taylor Roofing, IC, 14 x 20..... 8.00
Thomson's Puritan, IC, 14 x 20.....5.75
Tip Top, IC (Resquared), 14 x 20.... 6.62
" " IX " 14 x 20.... 7.88
U. S. Monongahela, IC, 14 x 20..... 6.50
U. S. Redipped, IC, 14 x 20..... 9.25
Venux, IC, 14 x 20 ..... 5.60
Waldo Redipped, IC, 14 x 20..... 7.25
Westmoreland, IC, 14 x 20 ..... 6.25
Wilkinsburg Redipped, IC, 20 x 28.16.00
" " IX, 20 x 28.19.00
Willow, IC, 14 x 20..... 6.25

American Bright Plates—

Almond, IC, 14 x 20..... $6.25
Brilliant (Tissue Packed), IC, 14x20. 9.00
Climax, IC, 14 x 20..... 6.50
" IX, 14 x 20..... 8.00
Florence, IC, 14x20..... 6.75
Hazel, IC, 14x20..... 5.80
Linden, IC, 14x20..... 6.50
Merchant's Dipped, IC, 14x20..... 11.00
Merlon, IC, 14x20..... 6.75
Mint, IC, 14x20..... 6.00
Palma Xtra, IC, 14x20..... 7.25
Phœnix, IC, 14x20..... 6.25
" IX, 14x20..... 7.75
Royal, Extra, IC, 14x20..... 7.00
U. S., IC, 14x20..... 7.25

Imported Terne Plates—

Charcoal.
Dean Grade.—IC, 14 x 20.....@$5.50
" 20 x 28.....@11.00
" IX, 14 x 20.....@ 6.75
" 20 x 28.....@13.50
Abercarne Grade.—IC, 14 x 20.....@ 5.40
" 20 x 28.....@10.80
" IX, 14 x 20...@ 6.6[illegible]
" 20 x 28.....@13.25

Imported Bright Plates—

Charcoal.
Duty: 2.2¢ ₱ ℔.
Melyn and Cal- IC, 10 x 14.....@$6.50
land Grade. " " IC, 12 x 12.....@ 6.75
" " " IC, 14 x 20.....@ 6.50
" " " IC, 20 x 28.....@13.00
" " " IX, 10 x 14.....@ 8.50
" " " IX, 12 x 12.....@ 8.75
" " " IX, 14 x 20.....@ 8.50
" " " IX, 20 x 28.....@17.00
" " DC, 12½ x 17.....@ 6.00
" " DX, 12½ x 17.....@ 8.00
Allaway Grade, IC, 10 x 14.....@ 6.00
" " IC, 12 x 12.....@ 6.25
" " IC, 14 x 20.....@ 6.00
" " IC, 20 x 28.....@12.00
" " IX, 10 x 14.....@ 7.50
" " IX, 12 x 12.....@ 7.75
" " IX, 14 x 20.....@ 7.50
" " IX, 20 x 28.....@15.00
" DC, 12½ x 17.....@ 5.50
" DX, 12½ x 17.....@ 7.00

Coke.
Steel Coke.—IC, 10x14, 14x20.....@$5.50
10x20.....@ 8.50
20x28.11.50@12.00
IX, 10x14, 14x20.....@ 6.75
B. V. Grade.—IC, 10x14, 14x20....@ 5.55

Imported Boiler Plates.—

IXX, 14x26..(112 sheets)..... ..@$13.38
IXX, 14x28..(112 sheets)..... ..@ 14.50
IXX, 14x31..(112 sheets)..... ..@ 16 00

Tinning—

Brass and Copper.....net

Tubing—

Tin..... 55%
Galvanized..... 55%

Brass and Copper.—

Standard List..... 35@40%

Troughs, Eave—See *Eave Troughs*

Trucks Stove—

Improved Lock Frame, per doz....$15.00
Steel Lock Frame, per doz..... 18.00
Daisy Improved Pattern, ₱ doz..... 18.00

Zinc—

600 ℔ casks..... ₱ ℔ 5½¢@5¾¢
Per ℔..... 6½¢

It Is Reported—

That on the 7th inst. fire broke out in the Hardware store of William Hunton, Granger, Texas, and entirely consumed the stock and building. The stock was valued at $1600, with insurance for $1000. Loss on building, $500; no insurance. The origin of the fire is unknown.

That almost the entire business part of the town of Latham in Butler County, Kan., was destroyed by fire on the morning of the 6th inst. Among the heaviest losers by the fire were the Winfield Hardware Company.

That Mason & Dale's Hardware store was considerably damaged by smoke and water in a fire at Bowmanville, Man., on the 6th inst.

That E. N. Falke has opened a new Hardware store at 811 Monroe street, Toledo, Ohio.

That burglars broke into C. M. Jones' Hardware store, at Ripley, N. Y., on the 8th inst., and carried off Revolvers, Knives and Razors to the amount of $150.

That in a fire at Memphis, Tenn., on the 13th inst., the stock of the Schmalzried Hardware Company suffered to the extent of $35,000. The insurance is $28,000.

That the firm of Heacock & Durfee, Gloversville, N, Y., dealers in Hardware, have dissolved. Mr. Heacock will continue the business alone.

That in a fire in the Phœnix Block, Concord, N. H., on the 11th inst., the stock of Hardware of Thompson & Hoague was damaged, mainly by water, to the extent of $15,000. The firm have opened a retail store in their wholesale establishment on Depot square, and will conduct the business there for the present.

That Arnold & Whitmore have entered the Hardware and Implement business at Ludlow, Ill.

That the store of C. Schnepff, Elkport, Iowa, was recently damaged by fire.

That G. W. Weston is closing out his Hardware business at North Branch, Mich.

That F. D. Woodworth, dealer in Hardware, Stoves, &c., Onondaga, Mich., has sold out to J. H. Strong.

That the Rockford Hardware Company, Rockford, Mich., have dissolved.

That R. Edmunds & Son, Warren, Pa., are out of business. They have been succeeded by T. O. Slater.

That Hamilton Welton is intending to enter the Hardware and Implement business at Paragon, Ind.

That Edward Thomas has purchased a half interest in the Hardware store of Herbert A. Wolcott, Carthage, Mo., and hereafter the firm name will be H. A. Wolcott & Co.

That A. A. Suppigar, of the firm of Kreige & Suppigar, Hardware dealers, Edwardsville, Mo., has sold his interest in the firm to J. C. McKitrick.

That C. W. McMahon has sold his interest in the Hardware business at Center Junction, Iowa, to his partner, Herbert Mackrill.

That H. Stonebrook and Theodore Thome have opened a Hardware store at Nashville, Ohio.

That the firm of Hancock & Boyes, Hardware merchants, Emerado, N. D., have dissolved.

Price-Lists, Circulars, &c.

PITTSBURGH BRASS COMPANY, Pittsburgh, Pa., and 36 Park place, New York: illustrated catalogue and price-list of Piano, Banquet, Vase, Table and Bracket Lamps. The book is divided into several sections, each class of goods by itself, to facilitate choosing what is wanted. There are a number of metal and onyx Tables, both with Lamps and without. Also an assortment of Shades and Shade Holders for Piano and Banquet Lamps, together with decorated Glass Shades for Table and Hand Lamps.

THE UNION HARDWARE COMPANY, Torrington, Conn., and 95 Chambers street, New York: Ice Skates. An illustrated price-list shows their Lock Lever Skate in various finishes, Lock Lever Union Extension Skates, Ladies' Lock Lever Skate, Ladies' Lock Lever Union Extension Skate, Ladies' Wood Top Skates, Donoghue Racing Skate, Union Skate Sharpener, &c.

THE BOURKE MFG. COMPANY, Youngstown, Ohio: Ventilating Sash Lock and Fastener, Diagonal Sash Lock and Fastener, Nonpareil Window Cleaner, Extension Handle Socket, Excelsior Bar Cleaner and Floor Scrubber and Dryer. A catalogue illustrates these goods, with descriptions and list prices.

JOHN ROBBINS MFG. COMPANY, 58 Kneeland street, Boston, Mass.: Badges, Medals, Plates and Checks. A catalogue gives 40 pages of illustrations of Badges and Medals, including aid and athletic Badges; Badges for army corps, bicycle and boys' clubs, for policemen, constables, detectives, firemen; fire alarm box Tags, sporting Medals, &c. These goods are made in solid gold, silver or nickel, and special designs are furnished when desired.

THE METAL WORKER.

NEW YORK AND CHICAGO.

Saturday, December 2, 1893.

DAVID WILLIAMS, - PUBLISHER

BUSINESS OFFICES:

NEW YORK.....96-102 Reade Street.
PHILADELPHIA.....220 South Fourth Street.
BOSTON.....146 Franklin Street.
PITTSBURGH..... Room 509 Hamilton Building.
CHICAGO.....59 Dearborn Street, cor. Randolph.
CINCINNATI.....Rooms 22-24 Pickering Building.
ST. LOUIS.....Bank of Commerce Building.
CLEVELAND.....312 The Cuyahoga.

BRITISH AGENCY: The Ironmonger, 42 Cannon street, London, England.

The New Tin Plate Tariff.

The clause in the tariff bill that was made public this week, affecting tin plates, proposes to change the duty from $2\frac{3}{10}$ cents per pound, as it exists under the McKinley tariff, to 40 per cent. ad valorem. This alteration from a specific to an ad valorem duty has aroused a great deal of opposition among tin plate importers, and there are very many reasons why the former method of imposing a tariff according to weight, in this particular article, should be adhered to. It is not a question of the amount of duty so much as a question of the way in which it is levied that is severely criticised. For certain theoretical reasons the ad valorem duty is the preferable, for it varies according to a changing market. The practical objections, however, are many and great, and are especially formidable in this article of tin plates. The existing duty of $2\frac{2}{10}$ cents per pound may be roughly stated as equivalent to from 75 to 80 per cent. ad valorem, so that the present duty is a reduction of about one-half. At present the wholesale market for plates is, let us say, 10 shillings and 6 pence per box for 108-pound Bessemer cokes, at Swansea, this being equivalent to $2.45, so that the duty per box will be 98 cents, as against $2.37 at present. On the higher grade of plates the difference would be proportionately less as the price advanced. Melyn plates, for example, are now quoted at the equivalent of $3.15, in large lots at Swansea, for 108 pounds, which, under the new duty, would pay $1.26, as against $2.37, the same as in the case of the cokes.

Objections to Ad Valorem Duty.

Without attempting to analyze all the objections that may be urged against an ad valorem duty, there are a few principal reasons that may be pointed out. In the first place, it is necessary to know the value of the goods at the time of shipment, and unless the customs inspector is an expert in tin plates he must rely upon the invoice valuation. In the larger ports of entry, like New York, the importations are so extensive that the inspectors may, perhaps, be fair judges of tin plates, and know the difference between the best and poorest grades, so that a manifestly false valuation on the invoice would be detected. But in the case of plates shipped in bond to interior custom houses where plates are infrequently received the customs inspector might readily pass the highest grade of plates invoiced as common cokes without knowing the difference. Under the present system of weights such a falsification is impossible, for there is no more difficulty in determining the exact weight of tin plate than any other article of merchandise, and the duty being dependent solely upon the weight there is no means of evading it unless by collusion with the inspector. It is also pointed out that tin plates are contracted for a long way ahead, in some cases extending over a year. With an ad valorem duty importers would hesitate a long while about making contracts, and if they did so would be careful to name so high a figure that they would be protected against any ordinary fluctuations in the market. The necessity of this will be understood when one considers the variation in the tin plate market and bears in mind the fact that the duty is paid according to the market value at the time of the shipment of the goods. Tin plates, for instance, that would be sold to-day for delivery 12 months hence, might in an extreme case vary $1 a box in price, which would be equivalent to 40 cents advance in duty. It is needless to go into all the details of the argument against ad valorem duties in this case. Those who are familiar with the tin plate trade know how very great are the opportunities for deceit, and how difficult it would be for the duty to be honestly levied and collected if any attempt were made to evade it. In connection with the new tin plate clause, much interest attaches to the change in the tariff on black sheets, which have been reduced to nearly one-third of the present duty. This puts a premium on the practice of dipping plates in this country as opposed to manufacturing them from the bar. . With free tin and the duty cut 60 per cent, on black sheets, it is manifest that the business of dipping plates will be a profitable industry here, while the manufacturer, with actual protection of say one cent a pound, will find it hard work to compete.

Highgate Sanitary Museum, London.

Rather more than a year ago the local board of Hornsey, one of the suburban districts of London, originated a permanent exhibition of sanitary appliances for the benefit of property owners and householders, as well as of sanitary engineers and plumbers. The experiment has proved a striking success, judging from the wide interest it has evoked: and the institution bids fair to become the parent of many similar exhibitions in England. A correspondent of an English journal who has recently visited the Highgate Sanitary Museum (as it is called, Highgate being included in the Hornsey district) gives some particulars respecting it, which will be of interest to our readers. The museum, he reports, contains a valuable and instructive collection of modern sanitary appliances, which must be of universal benefit to those interested in such things. It has grown rapidly during the first year of its existence, until at the present moment it consists of seven large rooms. It has a total floor space of nearly 5000 square feet, and contains upward of 1000 exhibits. Water is laid on, and the appliances are shown in operation. There are several working models, some of which are made in glass so that the action may be easily seen. There are also machines for testing cement, earthenware pipes, water fittings, bricks, macadam, &c. Specimens of the highest class of plumbing are exhibited, as well as object lessons in the shape of old and defective traps and joints. Arrangements have been made, it is stated, for lectures on sanitary science for the forthcoming winter, some of which were given last season, having been very much appreciated. The museum, which is a free institution, has been visited by thousands of persons during the year.

English Heating of Railway Cars.

The heating of railway carriages is a matter in which England and European nations generally are admittedly very backward. Considering the progress which has been made in the construction, lighting and comfort—in other respects—of the European cars, it has always been a matter of wonderment to the American traveler, and even to many natives themselves, that the only approach to heating in the winter season is by means of the old fashioned foot warmer, an article which should by this time have taken its place on the curiosity shelf alongside the old time warming pan of our grandmothers, and the *chauf pied*, the little box of lighted charcoal that the French countrywoman used to carry to church to keep her toes warm during the sermon. Reports from England speak, however, of a new departure in this respect on the part of the Midland Railway Company, who have adopted a more scientific system of heating on their line from London to

Scotland. The apparatus consists of pipes running round each car and connecting with the engine, where hot water is supplied and propelled by steam pressure, so as to be kept in constant circulation. Other lines are said to be contemplating the adoption of a similar plan.

Mixing Dampers.

The introduction of the so-called hot and cold duct system in hot blast heating where a fan is employed has developed numerous designs in dampers for mixing the air at its common point of discharge from the two ducts to the connecting flue. By this system hot air is conveyed in one duct and cold air in another to the mixing damper, which must then operate to admit air of the two temperatures in varying relative proportions, but always of the same total combined volume—that is, the hot air must be shut off in exactly the same proportion as the cold air is admitted, and a mixing chamber of sufficient size must be provided to prevent the direct discharge to the room of separate currents of air of greatly differing temperatures. There at are present in use several different styles of mixing dampers that are incorrect in design, in that they do not in all positions allow of the discharge of such volumes of hot and cold air as to maintain a constant resulting volume. The simplest arrangement must, of course, consist in forcing through the cold air duct fresh air from out of doors without imparting to it any heat whatever, thereby avoiding the necessity of a tempering coil or any special main mixing damper on the primary heater. If this method is followed, however, it becomes absolutely necessary that the mixing damper shall be so constructed as to shut air tight against the cold air supply when it is necessary, as in the coldest weather. On the other hand, it must be possible to supply only cold air, without mixture, to a room when desired. In some of the early arrangements of this system the area of the cold air supply was made only one-half that of the hot, so that it was impossible to get a mixture having cold air in greater proportion than one part cold and one part hot. It was found that upon days when the thermometer stood at 40° or above outside it was impossible to keep exceptionally protected and sun lit rooms, or those over the boilers, cool enough to be tolerated. Hence the necessity of making the area of cold air supply equal that of the hot air.

Thermostatic Control.

While the simplest method of control of temperature is, of course, by the manipulation of the mixing damper by the occupants of the respective rooms, yet much more positive results, with the avoidance of over or under heating, may be secured by operating the dampers entirely by thermostats in the rooms. If this method of control is adopted, however, it becomes necessary to temper the air in the cold air duct. Most of the thermostats now being applied act either to open wide or close tight the mixing damper, thereby alternately changing from a volume of all hot air to a volume of all cold or cool air. This is at present the greatest objection to this system of control, for there is no opportunity for the damper to remain longer in one position, and there is, of course, liability to noise in the continued operation. It is, therefore, at once evident that the air in the cold air duct must have a temperature only slightly less than that of the room being heated, otherwise there would be serious results in the form of objectionable drafts, due to the sudden admission of a large volume of exceedingly cold air. Recent developments point toward the general use of a form of thermostat operating by expansion of fluid, which shall be progressive and not intermittent in its operation.

Time to Look for Better Business.

It is a queer sort of philosophy, says *The Iron Age*, that does not recognize conditions as they exist. It is more singular still that credit should be expected for the profound act of shutting one's eyes and refusing to look. Yet this is being done by persons connected with the iron trade who fancy that they possess some influence as leaders of opinion. For many weary months, so many that we dislike to count them, trade has been so bad that it could hardly be worse, and yet there are individuals to be found, and of some pretensions to leadership, who persistently ignore the distress into which manufacturers and merchants have been plunged and tell them in effect that matters are not really bad, but to keep up their spirits, as times will surely be better by and by. This is a Micawber like spirit, merely waiting for something to turn up. It is not the spirit of an alert business man keenly alive to the influences prevailing at the moment and studying how he can best take advantage of them and rise above them. When business is poor such a man realizes it, acknowledges the fact and endeavors to put himself in shape to endure it. There is nothing to be gained by his being falsely told that he is mistaken in his views, that he will soon find affairs very much improved, and that then he will laugh at his apprehensions of trouble.

We believe that manufacturers are to-day not much in need of advice how to act. Those who hardly knew what to do when hard times so suddenly chilled them have been driven by the force of circumstances into the only course possible. They have retrenched in every way and in directions which at one time would not have been deemed open for such action. Expenses have been curtailed which seemed to be rigidly fixed. Arguments as to costs by sellers of materials have been wholly ignored, and prices have ruthlessly been beaten down, making such producers in their turn grapple with their own difficult problems. Without concerted action, and with no preconceived theories as to a permanent lowering of values, the whole country has nevertheless proceeded in that direction, and to day we find ourselves to have been participants in a revolution. It is possible that a reaction may be inspired by causes now wholly invisible which will again force prices on a higher plane, but it seems to us the part of wisdom to base no hopes on such a change.

Accepting values as they exist to-day, that manufacturer or merchant who is able to adjust his views most quickly to the new order of things will reap the greatest benefits. In many lines possible tariff changes have already been anticipated. Perhaps most commodities have fallen in price as low as, if not lower than, prospective reductions in duties might have forced them to go if a new tariff had been put into effect over night. If this is the case, there is no reason why business men generally should not feel confidence in existing values and purchase freely to cover their known requirements. The worst having been prepared for, the general interests of the country are just so much better off, as the reductions in duty when made are found to fall short of what had been expected.

With the revision of the tariff discounted, so that it is no longer a bugaboo, and with the currency question happily settled on a sound basis, thus checking the flow of gold abroad, there is nothing to prevent a revival of trade except the lack of confidence, which was so rudely shaken during the past spring and summer. If the philosophers of optimism and cheerfulness can stimulate the growth of confidence, now is the time for them to come forward, but the people have probably lost faith in such blind leaders who did not recognize calamity when brought face to face with it.

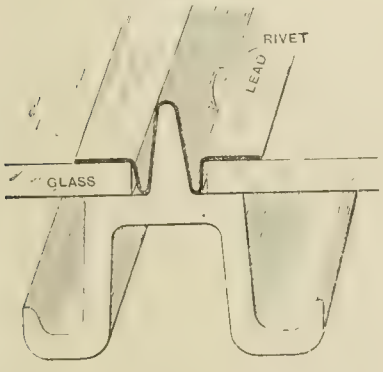
The Brooklyn, N. Y., Board of Education have decided to establish a manual training school in that city. The old High School building will be employed for the purpose and equipped with the most modern appliances for manual training. A salary of $3000 a year has been allotted to the principal and $7500 more will be spent for assistants.

The journeymen plumbers, gas and steam fitters of Local Union No. 57 in Columbus, Ohio, opened their trade school last week with a good attendance of members. The first subject taken up was: "Which is the best method to produce the most practical results in hot water circulation in kitchen stoves, ranges and boilers?" Several designs were sketched upon the blackboard by different members, and the subject give rise to a general discussion of much profit. The next subject to be taken up will, it is announced, be the important one of ventilation.

ROOFING AND CORNICE.

Forms of Glazing Bars.

The Pennycook Patent Glazing & Engineering Company of Glasgow, Scotland, make a specialty of constructing roofs of iron and glass for large buildings. One form of glazing bar used by the company is shown in Fig. 1. This bar is of solid iron and is adapted to a span of 9 feet. The construction is such that no putty is required for glazing, the sheet lead being secured to the bar by riveting, and then bent over the glass. Among the advantages claimed for this form of bar are that as the lead only is exposed to the weather no painting is required; that the condensation channels can be cleaned out from inside the roof without removing the glass. As there are no screws or nuts used scaffolding may be placed on top of roof without injury to the bar.



Forms of Glazing Bars.—Fig. 1.—Solid Iron Bar.

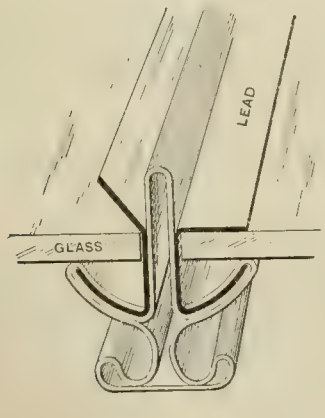


Fig. 2.—Sheet Metal Bar.

Another form of bar, which can be used in connection with sheet metal skylights, is shown in Fig. 2. This bar is made from two pieces of sheet metal, so constructed as to slip together and form condensation channels. Two strips of sheet lead are placed between the parts of the bar, and are so arranged as to be bent over the glass, thus forming a water tight joint. In Fig. 3 is presented a view of a wooden bar, which can be used for greenhouse work. The strips of sheet lead are secured to the bar by nailing, and are to be bent over the glass to form the joint.

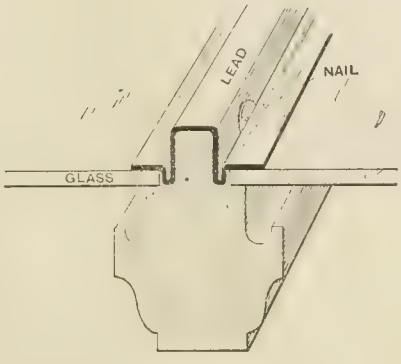


Fig. 3.—Wooden Bar.

FLASHINGS.

A NEW ROOF recently placed on the Indiana State House, Indianapolis, weighs some 900,000 pounds less than the one it has replaced. The old roof was of slate, of which there were about 60,000 pieces, each weighing 16¼ pounds, or 975,000 pounds in all. The new roof, which is of copper, weighs but 75,000 pounds. The placing of a new roof was necessary on account of leaks in winter from snows melted by steam pipes.

THE London *Engineer* mentions a new departure which has been adopted in the East in the way of mitigating the heat so much complained of in structures roofed with corrugated galvanized iron, &c. The method employed has been to place a layer of diatomite or kieselguhr composition, hitherto successfully employed for steam boiler covering, between the outer iron and an inside lining of thin wood or other suitable material. Recently the *Straits Times* reported that a large church erected in the Sepoy Lines, at Singapore, and opened by the Acting Governor of the Straits Settlement, was covered with composition made of Skye diatomite.

THE CATALOGUE just issued by J. M. Robinson & Co., Cincinnati, Ohio, for the year 1894 is an exhaustive presentation of their sheet metal working machines. More especial attention is given to cornice brakes, with which the name of the firm is associated. Their improved double eccentric cornice brake is illustrated, thoroughly described and its operation shown in bending various forms. Various other forms are noticed, including their box bending range and safe makers' brake for heavy work. It is impossible, however, to enumerate all the goods in the catalogue, which is very thoroughly illustrated. Among the machines, however, are gutter formers, bending machines, punching presses and dies, foot presses, V crimping and corrugating machines, &c. The sheet metal trade will be interested in obtaining copies of the catalogue, which is a pamphlet of convenient size, containing 112 pages.

THE NEW EMPIRE SLATE COMPANY were incorporated at Albany, N. Y., on November 29, to quarry and manufacture slate in Granville, Washington County. The directors are Hugh Williams of Middle Granville; Gilson S. Whitson and William H. Kirtland of New York City, and the capital is $50,000.

Lamp Explosions.

The Imperial Commission which was appointed in Germany some time ago to inquire into the causes of explosions of petroleum lamps, has, after exhaustive investigation, recently presented a report. From a copious collection of evidence the commissioners came to the conclusion that scarcely 1 per cent. of the total lamp explosions have been occasioned by attempting to extinguish the lamps by blowing down the chimney. The majority of the explosions were occasioned by special circumstances, such as knocking over, or letting fall the lamps, rapid movements, or holding aslant, whereby frequently ignition of the vapors in the interior of the oil reservoir or chamber is occasioned.

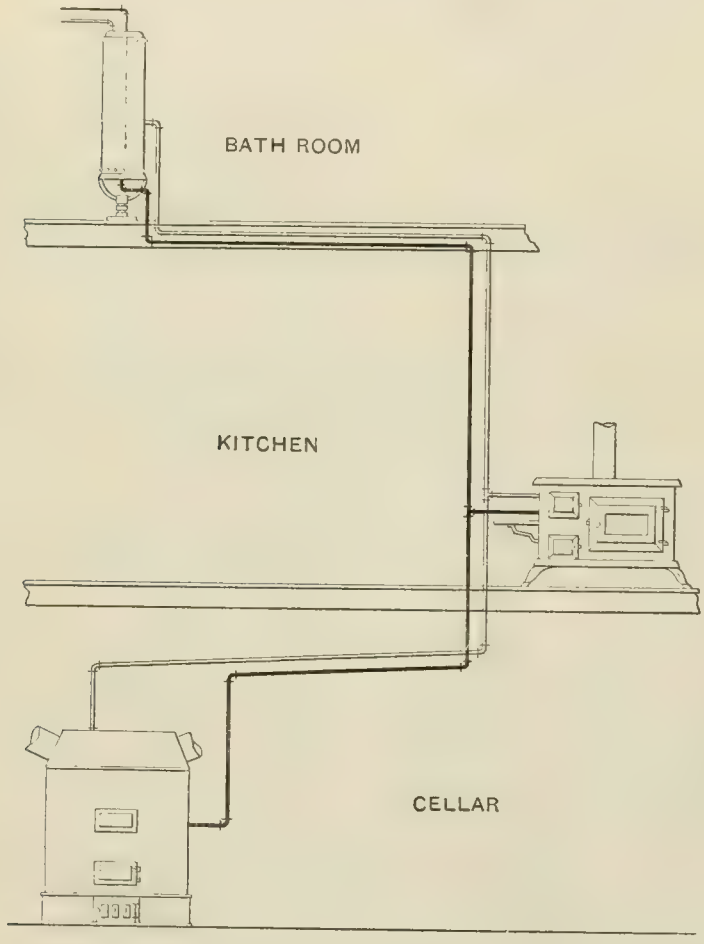
The *Journal of the Society of Chemical Industry* gives the following rules for the prevention of explosions, which, if observed, would obviate the risk of such accidents: 1. The lamp must have a heavy foot with a base as broad as possible, so that it cannot tip over. 2. The oil reservoir ought preferably to be of metal, rather than of glass or porcelain. 3. The well-fitting chimney must be adjusted so that no side drafts of air can reach the flame. 4. The burner-ring must be firmly fixed. 5. The wick ought to be soft and not too thick, also of a width such that it can be easily drawn into the holder. 6. The reservoir ought to be filled up completely before using the lamp; during the filling up no flame ought to be in the immediate neighborhood. 7. The lamp must always be kept clean. 8. The extinguishing of the lamp ought to be effected, after lowering the flame to the level of the burner, by blowing down the cylinder, not directly, but from one side, a kind of side-blast. The direct blowing into the cylinder is to be avoided. 9. The burning lamp ought not to be exposed to a draft. If this cannot be avoided, though, since the lamp must be carried about, then it must be protected from the draft by interposing a piece of paper or cardboard, &c.

As a result of the settlement of the sheet scale the works of the Moorhead-McCleane Company, sheet iron manufacturers, Pittsburgh, Pa., will probably resume in a few days' time. The firm have secured a number of orders recently.

THE LETTER BOX.

Reversed Circulation.

From H. R , *Pottstown, Pa.*—Having seen many knotty questions in *The Metal Worker* I send you herewith a sketch of one that beats the best. A party had a range connected to a circulating boiler in the usual manner, which worked all right except it did not give as much hot water as was needed. He then ran a pipe through the heater in the cellar, being careful to give it the proper elevation as it passed over the fire, then continued the flow and return pipes back and connected them at the range, as shown in the sketch. Each one works splendidly, independently of the other, or if the water coming from the range is the warmer, but when the fire in range is reduced the circulation is reversed between the range and the boiler. The hot water enters the bottom of boiler and returns from the side, and continues to circulate in that manner until the fire is again increased, when the proper circulation is again established. What causes this, and what is the remedy ?



Reversed Circulation.

Note.—We submit this case to the consideration of our readers. From the statement that the circulation is natural with either singly there seems little cause for the unusual change and no room is left for the supposition that the flow pipe was connected with the bottom of the coil, which otherwise might account for the reversing.

Determining Water Pressure.

From P. C., *Quebec, P. Q.*—In *The Metal Worker* of October 28 I see the request from "H. E. M." for a simple method of computing the pressure of water from pipes at different elevations. The answer is: "Multiply the depth in feet by 0.434." Does this apply to pipes of any diameter, or only to pipes of certain diameters ? In other words, would a pipe, say, 50 feet high and $\frac{5}{8}$ inch in diameter give the same pressure on the pressure gauge as another pipe of the same hight, but of 6-inch diameter ? What I do not clearly understand is this: Does the diameter of pipe make any difference in reckoning the pressure ? If so, please explain how it should be reckoned.

Answer.—One of the most difficult things to understand in dealing with fluids is that the pressure per square inch or for any other fixed area depends upon the hight of the column above it, and is entirely independent of the shape of that column or its size. If we took a pressure gauge and sunk it a mile in the ocean it would record the same weight or pressure as if we connected it with a 1-inch pipe a mile high. In the former case there is a column of water of thousands of square miles in area, and in the latter case it is less than a square inch in area. Water presses in all directions equally, and if a 1 inch pipe of, say, 100 feet hight is connected with a box, every square inch of the bottom of that box will record the same pressure, and if the pipe were 6 inches in diameter the pressure on the bottom of the box would be exactly the same. As an aid to understanding this our correspondent can call to mind the familiar illustration of the hydraulic pump. In that case a considerable pressure is exerted on a small stream of water, the fraction of an inch in diameter. When this comes into the main body of the pump, its power is multiplied as many times as the area of the larger chamber contains the sectional area of the small stream of water.

Size of Wire Bundles.

From W. Y. R., *Brooklyn.*—Will some reader of *The Metal Worker* tell me why wire is put up in 63 pound bundles ? There must be a history connected with it. Wire is still sold by the stone in some cases. Is a 63 pound bundle supposed to be a 5-stone package ? If so it should weigh 70 pounds, as a stone is 14 pounds. Some older members of the trade ought to be able to give this information.

Note.—We hope this inquiry will receive attention, as it affords opportunity for some interesting history about past customs.

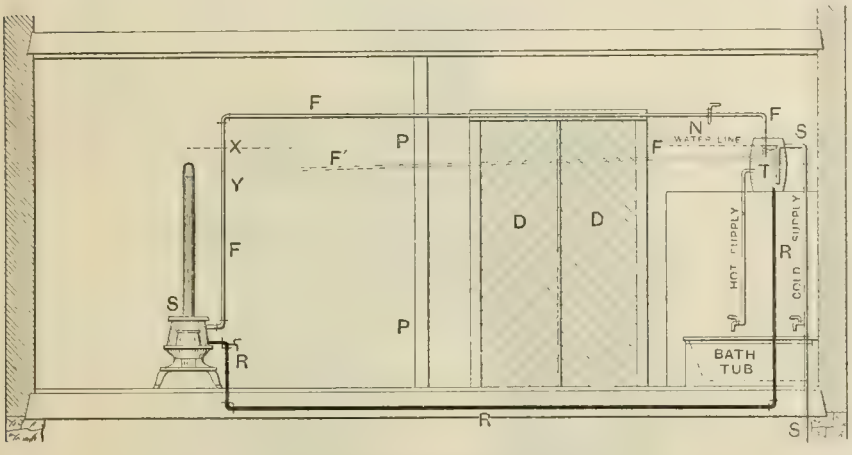
IX vs. IC Tin For Hot Air Pipes.

From Y. A. M., *Delaware.*—In "Cæsar's" letter in *The Metal Worker* of November 25, I saw a comment on the value of IX over IC tin for hot air pipes. In our shop we formerly got a great deal of heavy IC tin from the canning factories and used it for making hot air pipe. These sheets were not good enough in quality to stamp into tops and bottoms for cans and were so thick that when formed into can bodies they would not fit into regular tops and bottoms. Being so unusually thick and well coated they made a good stiff furnace pipe that would not collapse when handled, even when it was not swedged. That such tin makes as good pipe as IX tin I think "Cæsar" would not dispute. But when pipe made from the flimsy IC plates that have been washed rather than coated, and which must be swedged to hold its shape, is compared with an IX tin pipe there is no doubt as to the lasting qualities and length of time the latter will keep bright. This gives the

IX tin a superiority over the IC which has led the architect, whatever value his opinion may have, to go further and insist on having IXX tin for both hot air pipes and flue linings where good work is desired. The difference in the loss of heat from the two kinds of pipe is no doubt a matter of opinion rather than of proved information. There is, however, among the furnacemen I have met, a well established belief that IX tin loses less heat as well as makes a more durable pipe than IC tin.

Defective Circulating Plan Proposed.

From C. W. B., *Fresno, Cal.*—I was called upon during the past week to make an estimate on a job, which I have endeavored to bring out in the illustration. The work was to be done in a fire engine house and the plan as out lined is the idea of the engineer, who knows it will work. I declined to do the work in the manner proposed, for the reason that I am as positive that it will not work.



Defective Circulating Plan Proposed.

The tank T is an ordinary barrel supplied with cold water through an ordinary ball cock, and I suppose the supply is continued down to a point near the bottom of the barrel, as indicated, but did not climb up to examine. The water is heated at present by a coil in an ordinary heating stove. The stove is located on the outside of the wall in the rear of the bathroom and the job works satisfactorily as now connected. It was desired to heat the water from stove S in sketch, as fire has to be maintained in this stove through the winter. A ¾ pipe R was to be taken from the bottom of tank T, run down below floor and across under floor to stove S, a distance of 30 feet. Thence through a coil and back to T through ¾ pipes F F F, as indicated, through partition P and above double doors D D. The end was to enter T below the water line, as shown. The distance from water line to point N on return pipe is about 14 inches. The engineer says it will work if that distance is 12 feet. I told him it was bad practice to bring this return pipe down below the floor and then back up to stove, thus trapping it, but the job would work if he could get the flow pipe F in properly. But if he wanted this job to work he would have to raise his tank high enough so that he could connect as shown by dotted line F' from a point on flow pipe F, as at Y. This pipe would have to be above the doors, and as this would raise the tank above the ceiling I say that the only effect the connection proposed by him could have would be that steam would be made in F F above point X level with water in T. Steam would flow over, possibly carry some water with it, and make a commotion in tank T. There would be no circulation and the whole business would be unsatisfactory. My friend says that there is a force developed when this water is heated which will drive this water over any little obstruction of this kind, and does not limit it to 14 inches, but is willing to go 12 feet. I have set up the claim that hot water circulation is due to gravitation, and have never yet seen water circulate successfully through traps, air pockets, &c. I told my engineer friend that I should make a little sketch of his proposition and send it to better authority than I claimed to be. I trust you will find time and space to present your views on this particular case.

Note.—The opinion of our readers on this job will, no doubt, be gladly received by our correspondent. His conclusion that the job, as laid out, will not work is correct. The best plan is to raise the barrel so that the flow pipe will enter it below the water line, as he suggests. If the barrel cannot be raised, then the flow pipe must run as indicated by the dotted lines F' F'. If the barrel had a tight head in it, and an expansion tank, with the supply pipe and ball cock in it, was located above the point F, there would be no difficulty in the circulation, and the barrel would serve merely as a storage tank.

Stereotype Metal.

From D. H. F., *Saginaw, Mich.*—I would like to inquire through *The Metal Worker* how to make stereotype metal, how it is kept in good order and how it would be damaged?

Answer.—The different stereotyping houses, we believe, have their own private mixtures, for after a firm have been in this business some time they discover what they think are advantageous modifications of old formulas. The following are some formulas for stereotype metal: 9 parts lead, 2 antimony, 2 bismuth. Another one is: 16 lead, 4 antimony, 5 tin. A third one is: To every 6 pounds of lead add 1 pound of antimony. A cheap and simple way to make stereotype metal is to melt old type, and to every 14 pounds add about 6 pounds of grocers' tea chest lead. The metal can be cleaned by throwing in a little piece of tallow and stirring it with a ladle. Any admixture of zinc will spoil the metal.

An Area Trick.

From H. D., *Chicago, Ill.*—Please answer through *The Metal Worker* if a square 8 x 8 inches, containing 64 square inches, could be cut or divided so as to measure 65 square inches?

Answer.—Our correspondent refers no doubt to an old trick by which an apparent area of 64 inches is changed into 65 inches. Of course it is impossible to make any real change of the sort. A piece of paper 8 inches on a side and with square corners will contain 64 inches, neither more or less, and no clipping and readjusting of parts would ever make any difference in its size. By suitably dividing the surface, cutting it diagonally and moving the two parts along the area is apparently changed, but the hallucination is, we believe, due to the fact that the divided squares along the diagonal lines are each less than a square inch. We do not recall at the moment just what the size of the diagram is, or how it would be divided, but the principle is as we have stated.

Location of Air Supply.

From SNIPS, *East Hampton, N. Y.*—Is it absolutely necessary to have the cold air box to furnace on the north or west sides of a building when the prevailing winds in the locality during the winter season are from the southeast and southwest? Even under more favorable circumstances is it necessary? Why should a 10 x 14 register be marked by a furnace manufacturer to be used with a 10-inch round pipe when the pipe is only 78 inches in capacity and the 10 x 14 register has a capacity of 93 inches? Why would not 9 x 14 do, which has a capacity of 84 inches? I submit these questions to the furnacemen who read the Letter Box department, and hope that they will express themselves.

Two Chimneys to One Boiler.

From SUBSCRIBER, *Henryville, N. Y.*—Looking over the letter of "F. L. W." of Plankinton, S. D., in *The Metal Worker* of November 11, I send him the following suggestion: If he will build a round elbow at the base of the chimney the size of the pipe, and taper the upper end of the elbow to the shape of the chimney, he will not have any trouble with the draft, according to the experience I have had. The main thing is to get the column of heated air and smoke started up the flue without the retarding influence that it gets by striking abruptly against the back of the chimney.

The cost of insurance against accidents to workmen in Switzerland, as provided by a recent law, is to be borne as follows: Half by the employers, a quarter by the State and a quarter by the workmen.

STEAM AND HOT WATER.

Sylvester Phineas Pierce.

The firms of Pierce, Butler & Pierce Mfg. Company and S P. Pierce, Sons & Co., Syracuse, N. Y., have issued the following memorial notice upon the death of their president, S. P. Pierce:

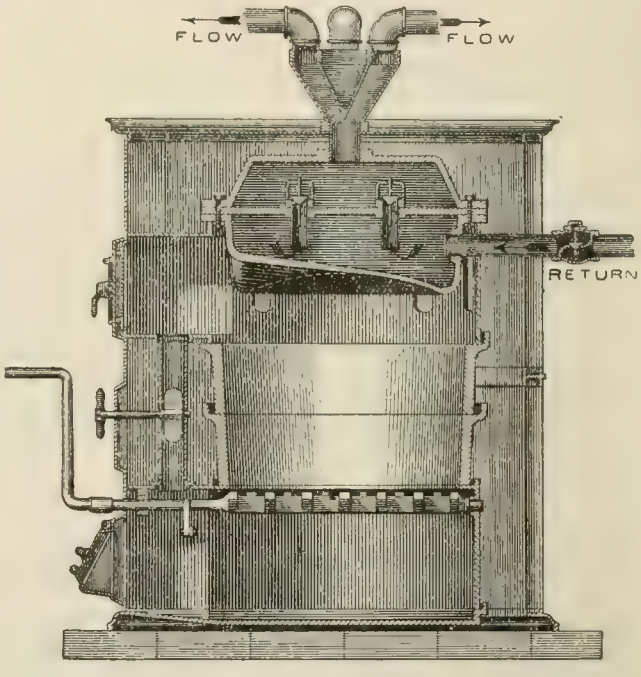
Our president, and the head of our house, was born in the little hamlet of Sanquoit, town of Paris, Oneida County, New York. He was the fifth of a family of eight children of Dr. Spaulding Pierce and Abigail Bacon, a representative couple of the sturdy New England stock which settled the wilderness of Central New York, then regarded as the far West, Dr. Pierce coming from Plainfield, of the Connecticut Valley, and his wife a native of Dedham, of the old Bay State. Dr. Pierce settled in Paris, Oneida County, and was a practicing physician of the old school, covering a large area of the early settlements of the time. He died when the boy Sylvester was but 12 years old. Financial reverses just previous to his death left the family in such circumstances that Sylvester soon found it necessary to make his own way in the world, and obtained employment in the village store. Afterward for two years he was a clerk in the store of Jay Hathaway of Rome, N. Y. Experience by day and study by night gave him a business education, and he soon gained a reputation as an expert accountant. From Rome he went to Utica, where he was employed in the dry goods store of Theo. S Gould, and later in the crockery establishment of Ransom Curtis. Observations made when traveling through the country in the service of this concern decided Mr. Pierce to locate in the village of Syracuse, and in 1839 he came here and opened a crockery store, removing in 1840 to the present site, where for 53 years Mr. Pierce has been the head of the business. From the village store grew a large importing and jobbing house, which became famous throughout the State and one of the leading establishments of our city. With the introduction of gas lighting Mr. Pierce added chandeliers to his business and started a small shop devoted to gas fitting and piping. From this beginning sprang a business which rapidly developed and led to the establishment of the firm of Pierce, Butler & Pierce, and later to the incorporation of the Pierce, Butler & Pierce Mfg. Company. Through all of these years of business life scrupulous honesty, steadfast integrity and a high order of business sagacity have characterized all undertakings in which he engaged. He leaves us and this life not only with the respect of all who have known him, but with the deeply fixed love and veneration of all those who have been connected with this gentle, kindly, true hearted man.

THE PITTSBURGH HEATING SUPPLY COMPANY, contractors for hot air, steam and hot water heating apparatus, have purchased the machine works at 229 Olive street, McKeesport, Pa., and expect to operate extensively in that line of business. The company will conduct a general steam fitting and furnace supply business.

The Caswell Hot Water Circulator.

We present in the accompanying illustrations views of the Caswell hot water circulator being put on the market by F. K. Caswell & Co., Hartford, Conn. In Fig. 1 a sectional view is presented, showing the position of the circulator and its connections with flow and return pipes. Fig. 2 is an enlarged sectional view through the circulator itself, showing its construction. The principle embodied in this heater is of more than usual interest, as the circulation described by the manufacturers is forced instead of being the result of gravity acting upon columns of water of unequal weight. We print below a description of it, furnished by the manufacturers:

"In this system the hot water is forced through the pipes and radiators by a low steam pressure and the cold water drawn back to the heater by a powerful vacuum. The action of the Caswell hot water circulator, which is shown in the accompanying illustration, is as follows: It consists of a circulator, which is placed over the fire in a portable setting, this circulator being divided into two chambers by a diaphragm. Connecting these chambers are four tubes closed at the top by small check valves. The upper chamber is connected with pipes leading to the radiators and expansion tank, while to the lower are connected the return pipes. Between the return pipes and the lower chamber a check valve is inserted, allowing the water to enter the chamber only. As the water in the lower chamber is heated a slight steam pressure is formed between the surface of the water and the bottom of the diaphragm. When the total pressure on the water reaches an amount equal to the weight of the vertical column of water in the risers plus the frictional resistance to circulation, action similar to that in the cylinder of a steam engine takes place, the water line being depressed and the water forced up to the radiators. As soon as the pressure in the lower chamber is relieved by the flow of the hot water the cold water from the return lifts the check valve and enters the circulator. The steam is instantly condensed, thus forming a vacuum, which draws the cold water back from the radiators to be reheated and redistributed as before. The Caswell hot water circulator is always put in on the open tank system, which insures absolute safety. In the second size, which has a capacity of 600 square feet direct radiation, the total power with which to effect a circulation is no less than 330 pounds for each pound of steam per square inch. It will readily be seen that the resistance limits the power generated, for as soon as the



The Caswell Hot-Water Circulator.—Fig. 1.—Sectional View through Apparatus.

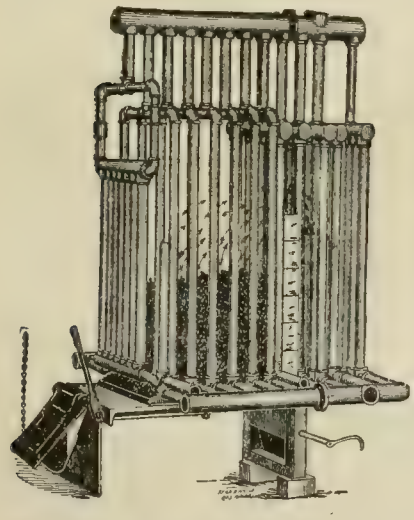
Fig. 2.—Enlarged View of Circulator.

power overbalances the resistance pulsation takes place and the pressure is at once relieved. In this heater the circulation is not continuous, but pulsating. Therefore the amount of heat furnished to the radiators depends directly upon the frequency of the pulsations. This depends, of course, on the fire, and can be regulated from one every half minute to one in nine or ten minutes. Forced circulation also insures rapidity of action and consequently high temperature. With forced circulation no pipes larger than for steam heating are required, most work being supplied with 1¼ inch. It has been demonstrated that ¾-inch pipes can be used with success even on horizontal runs of over 60 feet, but their use involves a waste of power without any corresponding gain."

We understand that the system has been subjected to severe tests of many months' duration, with very satisfactory results. The Caswell hot water circulator is made in portable form only, and in five sizes, having a capacity ranging from 325 square feet to 1200 square feet of direct radiation. It is provided with improved revolving grates, dust flue, double section cast iron fire pot and the new delivery turret, shown in Fig. 1, which is said to insure an equal distribution of water.

Phelps Ideal Hot Water Heater.

The accompanying illustration is a skeleton view of the Phelps hot water heater, manufactured by the Sanitary



Skeleton View of Phelps Ideal Hot Water Heater.

Plumbing Company, Oscaloosa, Iowa. All the principal features of the apparatus will be understood by an inspection of the engraving. The surface is seen to consist principally of vertical tubes connecting with headers at the top, and at the bottom with short horizontal tubes leading to headers. The upper sections finally converge into a single header, running the length of the heater. The fire wall at the back of the heater gives an indirect draft, so that the products of combustion are brought into contact with the entire surface of the boiler. It is particularly pointed out that the direct heat strikes all the surface, and therefore, that its efficiency is especially high. Being made of pipe all the joints in the heater are screwed. The pipes are tested to 600 pounds pressure. The pipes are so put in place that they can be cut out and new ones inserted without disturbing the rest of the heater, by any plumber or fitter with the ordinary pipe fitting tools. It is said that the Ideal will run 12 hours without replenishing and has been run for 24 houre in ordinary winter weather with the cheapest grade of unscreened coal. It is claimed that the combustion is so excellent that there is no trouble from smoke or soot, and that it will burn cheap slack, while at the same time being adapted to the economical burning of hard coal. These heaters are made in eight sizes, adapted to carry from 350 to 3000 feet of radiation, exclusive of mains.

HEATING NOTES.

R. D. Jackson, 42 Dey street, New York, is quite well pleased with the number of Electric boilers he has put on the trade this fall, and states that satisfaction has attended their use in every case.

W. M. Mackay, 236 Water street, New York, has arranged to sell and carry in stock a full line of Eureka automatic air valves. He also sells the different valves made by the Mackay Mfg. Company, 66 James street, Newark, N. J.

A little pamphlet distributed by the New York Central Iron Works, Geneva, N. Y., relates to the Dunning steam and hot water heating boilers. Many illustrations are shown of this well known apparatus and the special features of the boiler pointed out. Price lists and tables of sizes are also given. The company deserve much credit for recently donating a church fair in aid of the St. Franc's De Salle's Church, Geneva, N. Y., one of their portable steam heating boilers, on which they put a valuation of $500. E. N. Squires, secretary of the company, was undoubtedly largely instrumental in bringing this about.

HEATING AND PLUMBING.

NEW WORK AND CONTRACTS.

E. Joy of Syracuse, N. Y., has recently completed the installation of a steam heating plant, using eight Gorton boilers, for the United States Government post at Sackett's Harbor, N. Y.

Blake & Williams, 197 Wooster street, New York, have been engaged for some time on work for the Government at Governor's Island. Heating apparatus has been put in working order and four No. 3 Gorton boilers have been added.

Spicer Bros. are busily engaged in replacing the old drainage by a new system of sanitary plumbing in the town house at Fairfield, Conn.

Contracts have been made with John Kelly and A. A. Sanborn of Somerville, Mass., for the heat ng and ventilation of the Bingham School addition at that place.

Frank Grover of East Rochester is doing the plumbing for the new town hall at Salmon Falls, N. H.

The City Council of Worcestor, Mass., at a recent session received several petitions for the extension of the water service of the city. An order was passed authorizing the Superintendent of Public Buildings to put in a new ventilating apparatus in the police building at Waldo street, on plans recommended by D. B. Goslin, to cost $2500. They also passed an order for an extension of the water service to several streets.

A. A. Sanborn & Co., Boston, Mass., recently installed in the Ludlow Building in that place, a No. 16 Sectional Exeter steam boiler, the job involving 2000 feet of radiation.

A new heating apparatus is to be placed in Officer Pinkham's reception room at North Andover Mass., which will also be used to heat the Selectmen's office and the court room above.

The Barron Steam Heating Company, at 43 Dey street, New York, are engaged in installing a Bronson brick set steam boiler to heat an apartment house being erected by D. Ritchie on Eighty-second street, New York.

J. H Cogan & Co , Augusta, Maine, recently installed Exeter radiators in the following buildings: City Hotel and Weever's Restaurant, as well as in six residences at the place named; Hotel Rumford, Rumford Falls; three residences at Ellsworth as well as residences and stores at Rockland, Gardiner, Waterville, Farmingdale, Fairfield and Norridgewood, Maine.

The Bridgeport Steam Heating Company of Bridgeport, Conn., have secured the contract for placing a Gurney hot water heating system in the residence of Mrs. Colonel Vincent Collier, at Rowayton, Conn.

H. Kennedy, New Bedford, Mass., is heating the St. Hyacinth Church, using the Exeter ornamental steam radiators.

The Board of Regents of the University of Washington will receive plans, designs and specifications for the erection of a university building up to February 17, 1894, at the People's Savings Bank, at Seattle, Wash. One hundred and fifty thousand dollars has been appropriated for the building, which is to be provided with the most approved apparatus for heating and lighting, and a well arranged water supply and system of plumbing, drainage and ventilation.

Three large steam heating and plumbing contracts have been awarded Hardwicke & Co. of Niagara Falls, N. Y. The first is for the steam heating and plumbing for the new residence of James Davy, on Pine avenue; the second the fire extinguishing apparatus throughout the new building of the Rodwell Mfg. Company, and the third the steam heating for the Pacific Hotel.

Mullarkey & Senior have just completed the contract for gas fitting in the Nathan Littauer Hospital, at Gloversville, N. Y., and the management have accepted the work. For piping the building 2000 feet of pipe was used, and there are 380 lights. The contractors are now beginning the plumbing work, and 2 tons of iron soil pipe have been unloaded for the start.

J. S. Ladd & Co. have the contract for putting in the steam heating boiler in the Congregational Church at Raymond, N. H.

O. S. Mills & Co. have the contract for putting the heating apparatus in the new school building at Tunkhannock, Pa. The work will be done under the personal supervision of B. H. Shook.

The plumbing house of Rourke & McDonough, at Knoxville, Tenn., secured the contract for plumbing for the new Hattie House over two bidders from Cincinnati, three from Columbus, Ohio, two from Louisville, one from Nashville and one from Chattanooga. The contract amounts to something in the neighborhood of $9000 or $10,000.

PLUMBING and GAS FITTING.

Domestic Electrical Work.—II.*

By W. A. W.

MULTIPLE BELL CIRCUIT.

In the previous chapter was illustrated a simple single bell circuit. The next step will be a circuit with two or more bells operated from a single push button. Where a house is too large, or so constructed that one bell cannot with certainty be heard in all parts, it is often necessary to use a number of bells on one circuit, all of which will ring at the same time. In a house having a hall and stairway, and where two bells will be sufficient, one should be placed on the casing of the stairway well hole, so that it can be heard in the front part of the house both up and down stairs; the other should be located in the rear part of the house.

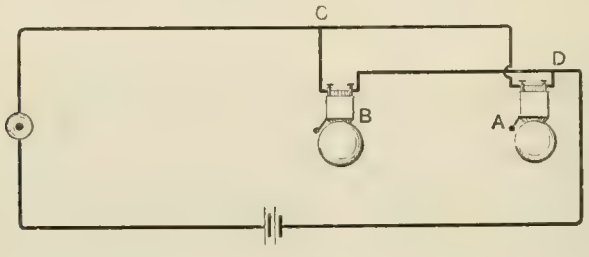


Fig. 2.—Two Bells Operated by One Push, Connected in Multiple Arc.

Fig. 2 shows the method of connecting bells in multiple arc, and is considered by many the most satisfactory way of operating two or more bells on one circuit. In this case run the wire from push button to bell A. Run a wire from bell B to battery and from battery back to push button. Connect a wire to opposite binding post on bell B, and splice to wire previously run from push to bell A, as shown in Fig. 2 at C.

To make the splice cut away the insulation on the main wire about ½ inch and scrape bright and clean, then cut away the insulation for about 2 inches from the end of splice and scrape; wrap this end around the bared space of main wire tightly, keeping the coils closely together, as shown in Fig. 3. This will insure a good metallic contact and will also prevent the splice from oxidizing and thus destroying the necessary metallic contact.

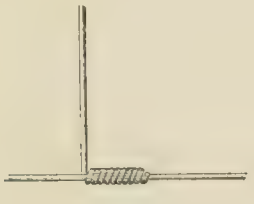


Fig. 3.—Splice for Connecting Branch to Main Wire.

To proceed with the wiring, connect a wire to the other binding post on bell A and splice to main wire running from bell B to battery, as shown at D in Fig. 2. On this circuit three cells of battery should be used to obtain a good sharp ring from the bells.

In Fig. 4 is shown the common (and the writer believes the best) practice of connecting bells in series—*i. e.*, wiring from one bell directly to the next, and making all but one single stroke bells. This latter precaution is necessary, as the entire current passes through each bell, and unless the adjustment and tension of the armature springs were exactly alike in each bell (which is practically impossible), the vibrations of the first bell would interfere with the others, and as a consequence none of them would ring. Any ordinary electric bell can be changed to a single stroke very readily, as shown in Fig. 5. A and B represent the binding posts of bell; C is the magnet; D the regulating contact screw; E the armature, carrying the hammer, and F the armature spring.

In the construction of the ordinary vibrating bell, the current is carried from the binding post A to the magnet, and from the magnet to the iron frame of the bell, thence through the armature to the contact screw D, and from there to the binding post B. By this arrangement the circuit is broken every time the magnet attracts the armature by separating it from the contact screw. The circuit being broken the magnet no longer attracts the armature, and the spring draws it back and again brings it in contact with screw D, whereby the circuit is again closed and the armature is again attracted as before, and so on.

In order to change a bell of this description to a single stroke, all that is necessary, as will be seen, is to disconnect the wire from the contact screw D and connect direct to the iron frame in such a manner as will leave the contact screw D entirely out of the circuit, as shown by dotted lines in Fig. 5. By this change, when the armature is once attracted it will remain there until released by some other means, which, in the arrangement of bells just described, would be by the one vibrating bell put into the circuit.

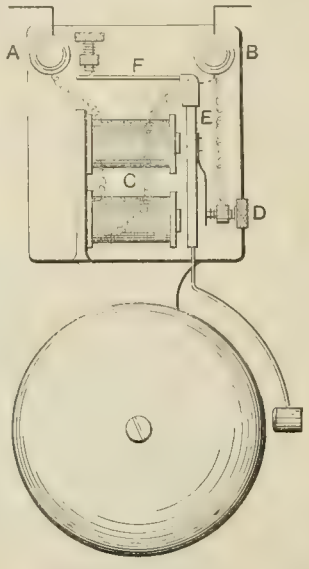


Fig. 5.—Method of Changing Vibrating to Single Stroke Bell.

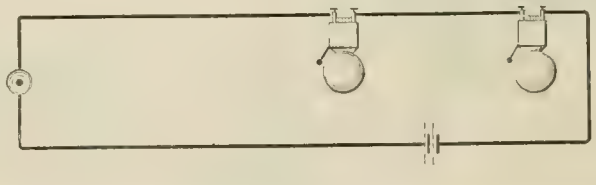


Fig. 4.—Two Bells Operated by One Push, Connected in Series.

Necessity of a Plumbing Inspector.

The following communication from a committee representing the plumbers is taken from an Indianapolis, Ind., daily paper:

Having noticed the controversy that is going on in the city papers in regard to the plumbing inspector, we wish to say to the public, from a standpoint of experience, that it is one of the most essential offices in the city; an office that ought not by any means to be abolished. As a rule people have not the proper conception of what it takes to make a first-class conscientious plumber. If we had all first-class men it would not be necessary for us to have an inspector, but such is not the case. We have men who profess to be plumbers who have been barred by the inspector, who will, if the office is abolished, go to work at once. There are some master plumbers who will employ them. Does the public want this class of men to do its work? If so, abolish the office. It is absolutely necessary that we have an inspector as

* Copyrighted, 1893, by David Williams.

a general safeguard. We, as a people, profess to be a progressive people in Indianapolis. What progress will be attained to abolish such an important office as the one in question? It will be laying low one of the most important sanitary regulations that has ever been passed by this city; lower than sand in water, and it will never make another effort to rise to the top. While we are on top we should stay in that position.

The office was created for a laudable purpose; it has done good, to our personal knowledge at least, if not to the public in general. It will continue to accomplish much good if left alone and competent men are placed in the position. We have good men who can fill this place with credit and profit. We, as experienced men, could, if necessary, unfold to public view some unheard of circumstances which exist in this city and which would shock public sentiment beyond measure and cause an investigation to be made for the health of the occupants of certain buildings. Such work as this was done without an inspector.

We repeat it again that people in general do not realize what has been done and what changes are being wrought by the inspection of all work. We have a building inspector; why not have a plumbing inspector? It has been proven that the office is more than self sustaining; certainly that is not the reason some want it abolished. All work as it is now put in is properly ventilated. The stacks are run high enough to give draft sufficient to carry away all odor that necessarily arises from this class of work.

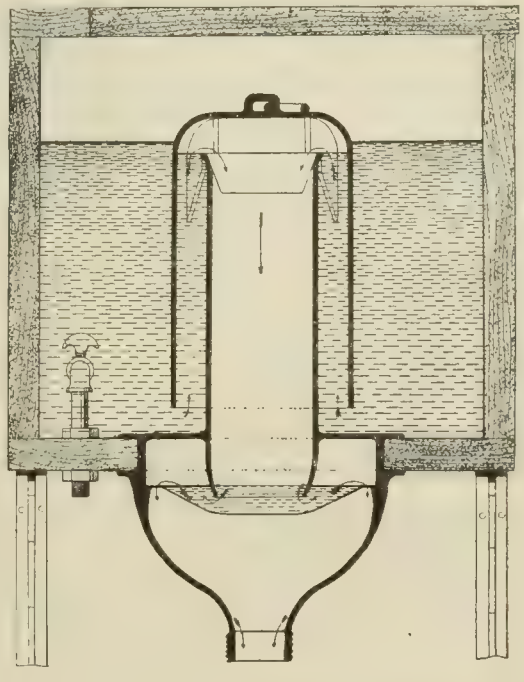
We think it would be well for the citizens and council to look at what New York has done in regard to this question. The State Board of Health was moved to investigate what sanitary plumbing meant, and found when properly done that it was one of the greatest sources of good health, and when improperly done one of the most deadly and disease breeding sources of evil, consequently they appealed to the State Legislature to enact a law regulating the trade of plumbing. A man professing to be a plumber must go before a board of practical plumbers appointed for the purpose of examining such applicants. If they pass they are given a certificate; if rejected they are not allowed to work any more than would a rejected medical student if rejected by a college faculty. We need just such legislation as that in our State. If the City Council repeals the ordinance it looks to us as though that body has not the proper conception of public good, and has not inquired into the merits of the office; and because it will help to straighten out the complication of having an inspector serving and another appointed.

What would this city be without gas inspectors? The master plumbers call them into consultation on jobs of any size, do the work according to what they say, and all is harmonious. If their existence depended, as does the plumbing inspector, upon skill and intelligence, some one would probably question their right to office. While we recognize gas inspectors, will it not be more important that we have a plumbing inspector to check dissemination of diseases which are constantly coming up to be checked? May it please our honorable body, the City Council, not to repeal the ordinance.

HENRY ECKHARDT, Bethlehem, Pa., plumber, is working on a number of contracts in his line of business. He is engaged in placing all modern improvements in the sanitary plumbing line in the two new residences for Wolle & Kemmerer, on the Allentown road, and in the new building of School Director William B. Shaffer, in West Bethlehem, and in the new residence of William Renner, on Linden street, B.

The Yeteve Automatic Syphon Tank.

The Walcott-Hurlbut Company, 175 and 177 Lake street, Chicago, are introducing the Yeteve automatic syphon tank, which is herewith illustrated. The syphon used in the tank is an adaptation of the Field-Waring patents with Poore's breaking device to flushing closets and urinals. The syphon consists of an annular intaking limb, and a discharging limb, at the top of which is an annular brass lip or mouthpiece, the bottom of which is tapered to a less diameter. The discharging limb has a brass cup suspended under the lower end of it. The syphon is brought into action (the tank being filled) by means of a small stream of water flowing over the annular mouthpiece and falling free of the sides of the discharging limb. As soon as the lower end of the discharging limb has been sealed by the filling of the brass cup, the falling stream of water gathers up and carries out with it a portion of the contained air, thus producing a slight rarefaction. This causes the water to rise and flow over the mouthpiece of the discharging limb, causing more rarefaction; this continues until the syphon is brought into full play. On the tank being emptied to the bottom of the intaking limb the flow is checked and air enters the discharging limb and the syphon is vented ready to start again as soon as the tank is filled.



The Yeteve Automatic Syphon Tank.

TRAPS AND VENTS.

HARRY SALYER has opened a new plumbing shop at Valparaiso, Ind., on College Hill, in the Salisbury Building.

A LOCAL PAPER makes the following inquiries in reference to plumbing in Leominster, Mass.: "How does it happen that with all the sanitary improvements that are being made, this town has no inspector of plumbing? There is no class of work that needs closer watching than plumbing. Not that the plumbers are dishonest, but the class of work they do demands care, and a careless mistake may cost lives. Let us have a competent man to look after this branch of the work."

A NOVEL SIGN, or rather attraction to his place of business, used by a plumber in Long Island City, L. I., is an arrangement of soil pipes and water closets on the roof of his shop.

W. J. KENNEDY & CO., plumbers, of Putman street, have opened an office in the new Fletcher Block, on Medford street, Somerville, Mass.

THE MASTER PLUMBERS' ASSOCIATION of Providence, R. I., held its customary monthly meeting recently. The meeting was presided over by the president, P. Tierney, and considerable business of a private nature was transacted. After the meeting had adjourned the members took possession of the banquet hall, where an excellent supper was served. The association had for its special guest Inspector of Plumbing Reuben S. Bemis, who gave the members an idea how the department was to be managed and what the relations are between his department and the trade. Mr. Bemis' remarks were listened to very attentively, and from the remarks made by several who were present the city had made a happy choice in the inspector of plumbing.

STAFFORD & WARD, Jacksonville, Fla., have got the contract for putting the plumbing in good order at the St. James Hotel, and have a large force of men at work.

THE SECOND ANNUAL SANITARY CONVENTION of the State of California will be held at San José on Monday, April 16, 1894, being the day preceding the annual session of the California State Medical Society.

PRESIDENT EYANSON and Secretary Clark of the Master Plumbers' Association of Philadelphia have addressed a letter to Captain Walton, chairman of Councils' Committee on Highways, requesting him to name a time when a committee of master plumbers can appear before the committee to protest against the passage of a pending ordinance regulating the repaving of streets opened by plumbers and the depositing of a sum of money with the city treasurer to insure the city that the street will be kept in repair. The

plumbers contend that the bill will enable anybody or everybody to tear up and repave the streets by merely depositing a nominal sum with the city treasurer for two years.

DANIEL SULLIVAN is the plumbing inspector of Long Island City, L. I., and reports a good grade of work being done in that neighborhood.

W. BRODIE, 131–133 Verona avenue, Long Island City, L. I., keeps a representative plumbing and steam fitting shop, and in addition runs a full line of hardware, household utensils and stoves. At present the plumbing department is not so busily engaged as is the steam and hot water department. He is installing heating plants in several residences, hotels and greenhouses near by.

CORNELIUS C. CROWLEY, the inspector of plumbing at Clinton, Mass., has opened his office in the town clerk's office.

E. ASPINALL, 98–100 Beekman street, New York, importer of and dealer in plumbers' materials, has recently added to his stock a line of Steel Clad baths, made by the Steel Bath Mfg. Company, Detroit, Mich., and New York.

PRESIDENT ADAM SCHNEIDER and Secretary Bonesteel of the Master Plumbers' Association of Cleveland, Ohio, are preparing a bill for presentation at the next session of the Legislature. The bill will provide for a thorough examination of all plumbers and of all who contemplate embarking in the plumbing business.

BURGLARS recently got into J. W. Carter's plumbing and gas fitting establishment, at Greenfield, Ind., and blew open the safe. It was totally destroyed, and the concussion was so terrific that it shook the goods from the shelves and counters. There was but little money in the safe.

THE BOSTON TRADE have recenly been favored with an announcement sent out in the form of a card, 1 x 2 inches, which reads as follows:

MAURICE ALEXANDER LYNCH.

10½ pounds.
October 18, 1893.

P. J. Lynch, the well known manager of the Dececo Company's Boston store, is responsible for this.

A vessel sailed from San Francisco for Havre, France, last week, carrying the first full cargo of tallow ever shipped from the Pacific Coast.

On Wednesday, November 22, the first steel merchant vessel ever built in Maine was launched at Bath. She is the twin screw steamer "City of Lowell," built for the Norwich & New York Transportation Company, and designed by A. Cary Smith of New York. The vessel is a magnificent example of a modern Sound steamer. She is 336 feet long, 49 feet molded beam, or 66 feet from guard to guard amidship; will draw 13 feet of water when loaded and steam 20 knots an hour at the least, with a possible 22 knots. The hull is unusually strong, the frames being steel angle irons covered with steel plates $\frac{2}{16}$ inch thick. The decks are of steel covered with thick pine. The "City of Lowell" is a twin screw boat with triple expansion engines of 26, 40 and 64 inch cylinders, 36 inches stroke and 4500 indicated horse power. Steam will be supplied by six Scotch return tubular boilers, built for a working pressure of 165 pounds.

Management of Men and Manufacturing Industries.*

SECOND PAPER.

Engineering the Establishment of Competitive Manufacturing Enterprises.

BY THOMAS D. WEST, SHARPSVILLE, PA.

In days of sharp competition, the starting of new enterprises soon places upon the shoulders of its managers and investors a weight they had not figured on carrying, and all sentimental ideas of self importance and there is "millions in it" vanish long before dividends are declared.

Could the struggles of late enterprises to get a foothold be fully outlined we could not fail to have volume after volume giving recitals of trials. Could the principals in them have foreseen what they had to go through, with the chances to be taken ere they could establish a paying business, there would have been much hesitancy before starting in and a great probability of their not having done so.

The writer having fought through two such undertakings within the past five years, the first being lost by fire, should be in a position to know from experience some of the difficulties attending the establishment of a business open to free competition, an element most all new enterprises have to figure on combating.

Procuring Proficient Employees.

Of the many struggles to be met and mastered there is none more serious than that of getting a works filled with competent, faithful employees having qualifications such as are necessary to fill the many different characteristic lines of work called for in their business.

I know that there are those who do not believe it, but nevertheless such is true. There are industries which it may take from one to three years to procure the character of employees they would like to see filling all posts of duty, and one factor almost all new enterprises should specially figure on at the start is that of not being compelled to rush out work to the full capacity of their plant.

Go Slow the First Year.

The endeavor to do this will often entail serious loss financially. There are few whose character of manufacture will admit of such proceedings without loss, but with almost all it is much the better plan to go easy for the first year and be under as few obligations as possible in matters of manufacturing their product.

In first starting business the quality and quantity of an employee's daily output is to be considered. A new firm will, by having new appliances, &c., have their own customs and standard they will desire to see adopted and achieved. No matter if the mechanic or employee did do the same character of work in his last place their standard is not yours and you want the benefit of modern arrangement and tools and the work done to your idea.

If your plant is rushed your men will know it and in nine cases out of ten you will find yourself placed in the position to shut up shop or let the employees, to a degree, establish their own notions of the customs and standard to be adopted.

No one but an experienced manager knows how difficult and expensive it is to undertake to change the customs, day's work and standard in a workshop after it is once established.

If in first starting up a firm could be assured of filling all its positions with men having the character and qualifications they would like them to have, and if it were not necessary before procuring one good man to discharge in some cases a dozen, business could be figured different, and the rushing of the plant to its full capacity, turning out the quality and quantity desired profitably, could be much more satisfactorily relied upon.

Taking the employees' side of the subject, it is also better for them that the starting off of a new plant should go slow, for it gives all more room to work, a better chance for the overseer to assist them in systemizing and becoming accustomed to their labors, and should the employee at first not manifest the ability required, business not being rushing the overseer can permit the man hanging on a little longer to see if he can make any success of him, and often eventually thereby making a reliable man that can stay as long as he may desire; otherwise he might be walking the streets looking for work.

Endangering Life and Breaking Machinery.

A factor to be also considered by the employer and employee in starting a new plant is the much lessened risks taken in persons being injured where there is much new machinery with green hands to run it by going slow the first year.

It is much better for the overseer to have ample time to watch and educate employees in the use of tools and machinery than to have them all crowded together with a go-as-you-can principle, injuring themselves and breaking the machinery.

Testing New Machinery.

Another good reason why it is advisable for new firms to figure on going slow the first year is to test their machinery. The plant is yet to be built that for the first year did not discover many weak points in its appliances and machinery that required shut downs and time to strengthen and repair. If rushed with work things will be found to go wrong that would not have given any trouble could there only have been the time spared to humor and nurse them, for new machinery often requires such treatment in order to have it run and act well just as much as a sick child.

Financial Troubles.

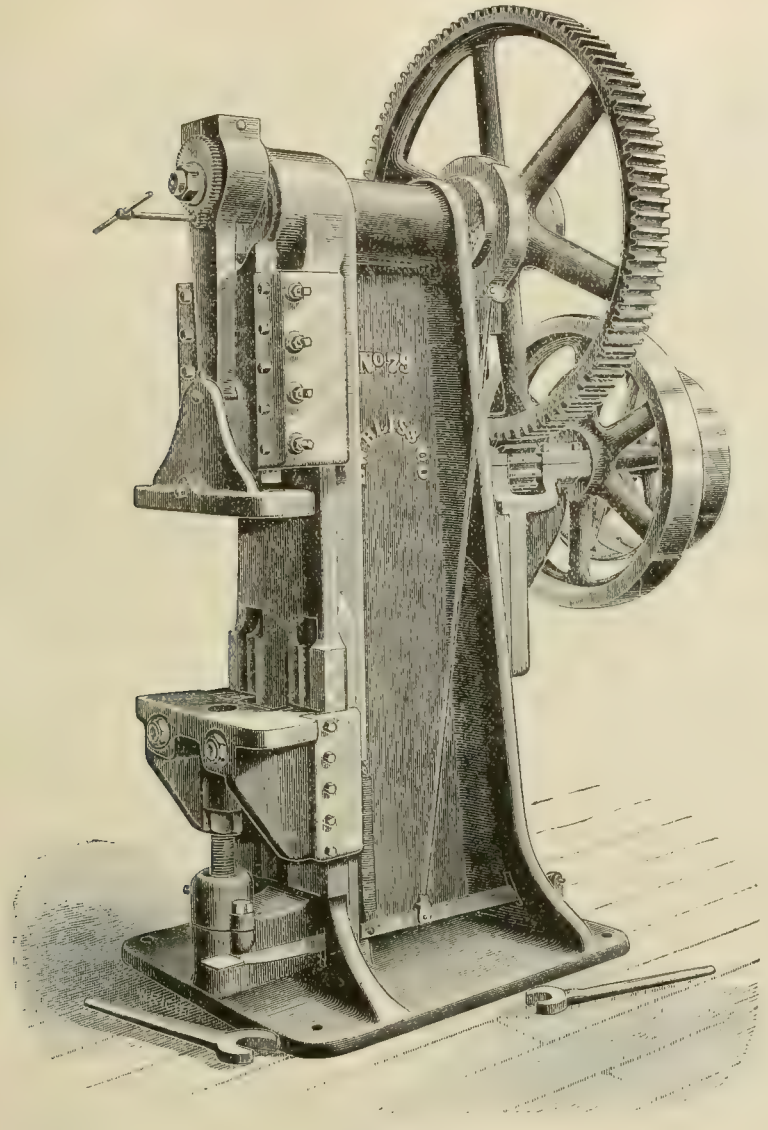
As a general thing a plant will be more sure of making money by going slow the first year than by attempting to drive the plant to its utmost capacity, and it is pretty sure to be the case that more money is laid out to put up the buildings and place machinery ready to start than was figured on, and the establishment often finds itself left with a very small working capital. If with such it is attempted to rush business the first year the chances are that the plant goes under, or is involved in difficulties from which several years of profitable work may extricate it.

A firm cannot survive many blunders, and the attempt to rush business the first year is generally to try a risk. "Be sure you are right, then go ahead."

* Read before the Civil Engineers' Club of Cleveland, Ohio, September 12, 1893.

The Bliss Reducing Power Press.

The engraving shows a long stroke press designed by the E. W. Bliss Company of Brooklyn, N. Y., for redrawing, shaping, trimming and other operations on deep sheet metal articles. It is provided with a screw adjustment for the table, which permits the use of dies varying greatly in hight, and also has an eccentric device in the pitman which facilitates making the finer adjustments required for the tools. The press is provided with an automatic clutch controlled by foot power, so as to have the slide stop automatically at the top of the stroke, unless continuous strokes are wanted, in which case the foot is kept on the treadle. The machine is made with or without gearing. For broaching castings or forgings where a very slow movement is required it is frequently constructed with back gearing of much greater ratio than shown, in which case a friction clutch on the driving shaft is used instead of automatic clutch on the crank shaft. The press, as shown in the cut, weighs about 8200 pounds, has a maximum distance between bed and slide of 15½ inches, an adjustment for this space of 10 inches and a stroke up to 8 inches. The ratio of gearing is one to seven and a half and the number of strokes usually made per minute 40.

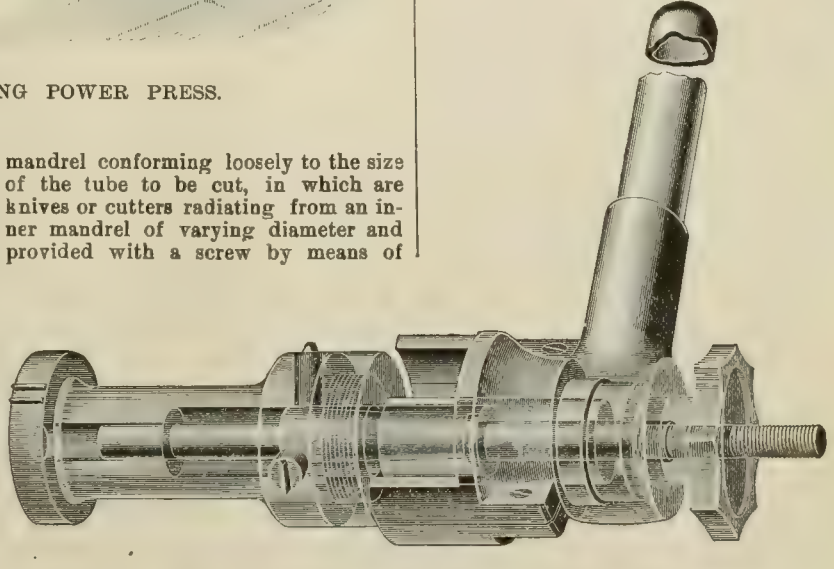


THE BLISS REDUCING POWER PRESS.

The Le Vasseur Boiler Tube Cutter.

This tool is intended for cutting out old boiler tubes or flues for renewal or otherwise, and for trimming off new flues or cutting pipe. It consists of a mandrel conforming loosely to the size of the tube to be cut, in which are knives or cutters radiating from an inner mandrel of varying diameter and provided with a screw by means of which the knives may be fed out as the cut in the tube progresses. These knives are attached by dovetail grooves in the mandrel.

In operation the tool is placed in the tube with the knives at the point to be cut; the tool is then revolved by means of a ratchet handle and the nut is held stationary, which gradually draws the inner mandrel toward the handle, thus bringing the larger diameter under the heels of the knives and throwing them out against the inner wall of the tube, the operation continuing in this manner until the cut is completed. When the nut is run back to its original position the mandrel may then be pushed from the handle and the knives drawn down into their sockets and the tool removed. This cutter is made by the Gouverneur Machine Company of Gouverneur, N. J.



THE LE VASSEUR BOILER TUBE CUTTER.

Experiments are progressing at the large Falun copper mines in Sweden for the purpose of extracting zinc in its pure state. There are considerable deposits of zinc ore in that district ; and in case the experimental working leads to a regular manufacture, Falun will be the first place in Sweden where pure zinc has been produced.

Announcement is made that the Republic of Nicaragua is about to bring suit in the United States courts against the embarrassed Nicaragua Canal Construction Company for failure to fulfill their contracts with that Government. The reasons given are that no work has been done on the canal for a year and that the company have gone into the hands of a receiver.

An official report has been received in Washington from the special agent sent by the Government to investigate the gold discoveries in Minnesota. The agent reports that he is firmly convinced that the district in the vicinity of Rainy Lake is distinctively a mineral country. In the quartz of Township 71 the mineral is deemed very rich, and the land has been withdrawn from settlement.

A British trade contemporary lays stress upon a noticeable feature that has recently developed in the engineering trades of the English Midlands—namely, the demand from Russia for machinery and plant for iron and steel making. Some important contracts have been lately forwarded and others are now in hand for rolling mill machinery of the most improved kind, showing the growth of enterprise in the direction of the manufacture of steel and iron in the dominions of the Czar.

TIN PLATES.

The Morewood Company's Tin Plate Works.

The Morewood Company are now getting in shape their new tin plate works at Gas City, Ind. For some time they have been running the coating department, but results have not been satisfactory, owing to frequent delays in receiving supplies of black plates, some of which have been purchased from American makers and some imported from Wales. Meantime the erection of rolling mills has been pushed, and these will shortly be in operation, after which there will be no interruption to the company's business for lack of essential materials.

The establishment of this plant at Gas City is wholly due to the enterprise of the president of the company, J. H. Rogers, one of the foremost manufacturers of tin plate in Wales, operating two large works. For some years Mr. Rogers had foreseen that the United States would eventually engage in the manufacture of tin plate, and contemplated making a venture on his own account. Some two years since this idea developed into a determination, and he visited this country to survey the field with that object in view. Early in 1892 he decided to locate at Gas City, but in the meantime put up temporary coating works at Elizabethport, N. J., which are now being removed to Gas City. Contracts for the building and much of the machinery were let in the spring and summer of 1892, but ground was not broken for the foundations until October. Since then work has been pushed as rapidly as consistent with the erection of a good plant on a thoroughly substantial basis. The buildings which have been erected are all strictly fire proof, having steel frames and metal roofs and sides. They are equipped with the best machinery adapted to the manufacture of tin plate, among which are found numerous special machines devised by Mr. Rogers for the rapid and easy handling of materials.

At present seven tinning stacks are in operation, but within a month three more will be at work. Of these there are three that exclusively run on ternes, while the others can vary from bright to ternes, according to the requirements of the trade. The pots used are not new, being principally of the kind invented by Mr. Rogers' father

For months Mr. Rogers visited meat and fruit packers and other tin plate consumers, getting their criticisms of the ordinary plates and finding out what was demanded. The personal contact with the consumer convinced him that tin plate makers were altogether on the wrong track in trying to make their plates as cheaply as possible.

In the pickling, annealing and rolling departments old methods are dropped as much as possible. Here every effort is made to economize labor and insure rapidity of operation. Pickling vats are filled, agitated and emptied by ingenious machinery. Annealing furnaces are operated by a mechanical charger. The rolls are arranged on a plan not hitherto known in this country. There are four cold rolling mills in which the trains are set in parallel rolls run by gearing from a common engine. In other works the practice is to set the rolls in a straight line. There are numerous reasons advanced by the Morewood Company in favor of their method, in which they follow the latest and most improved practice in the best Welsh mills. The hot rolling mills now in course of construction will at first comprise four mills, but it is expected that four more will be added between now and next summer. For the present tin plate slabs will be purchased, but it is the intention of the company to erect steel works at an early day to make their own steel, and thus control the quality of their material as far as possible.

The brands adopted by the company thus far are as follows: F. W. B. This is the heaviest coated roofing plate. J. H. R. is the next grade of terne plate, and is of Worcester grade. H. C. B. is the Lily grade of terne. P. T. L. is a terne, and is the grade with which the exposition buildings in Philadelphia in 1876 were roofed. R. H. J. is a bright plate intended for the use of canners of meat, fish, fruit, &c.,

These statements are subject to some qualification, in view of possible action upon the tariff question. If the duty is not disturbed it is the intention of the company to push extensions of the plant steadily forward until it becomes the largest in the world. In the arrangement of their buildings this has been kept in view, and plenty of room has been kept for that purpose. The inclosure comprises over 50 acres. It is in one of the best gas districts in Indiana, where the pressure is constant at nearly 300 pounds. Railroad connections are afforded by the Panhandle branch of the Pennsylvania system.

SCRAP.

MARSHALL BROS., Philadelphia, rolling mill proprietors and tin plate manufacturers, have recently received a 36-inch trimming shear from the Leechburg Foundry & Machine Company, Pittsburgh, Pa.

A WESTERN SCIENTIST is visiting Eastern tin plate manufacturers with the object of selling a new method of tin plating which he declares will revolutionize the manufacture in the direction of simplicity and cheapness of production. He is reported to be asking $10,000 for his invention.

THE DEADLOCK which has existed for more than three months at the works of the Pontymister Tin Plate Company, Pontymister, South Wales, still continues. The Newport Chamber of Commerce recently offered their services as arbitrators in the dispute, but P. S. Phillips, the proprietor, declined their mediation. He stated that he had offered to take back such of the men as he required on terms similar to those ruling in other works in the neighborhood, but if they declined to accept his offer he should at once proceed to start the works with outsiders, who were only too anxious to obtain employment.

THE GLOBE TIN PLATE COMPANY have been incorporated at Chicago for the manufacture of tinned and terne plates. The incorporators are James Spruce, William Killmer and Henry C. Gager. A manufacturing plant will, it is stated, be erected at Hammond, Ind., at a cost of $32,000.

THE WESTERN TIN PLATE COMPANY, Belleville, Ill., have commenced operations with one set of Morewood pots. The company use American black sheets exclusively.

THE BRITISH TIN PLATE MARKET at the middle of this week was again depressed, orders being scarce and prices weak and irregular. Over 20 Welsh tin plate works are idle, and the major portion of the rest are working only part of their capacity. Stocks, nevertheless, are piling up. Last returns show 258,000 boxes in Swansea, or about double the normal amount for this season, and dealers in London and Liverpool are reported to hold immense stocks of plates.

Trade Training for American Boys.

The following able article, demonstrating the need of a more efficient system of trade training for American born lads, by means of trade schools or other similar methods, by which definite and practical manual instruction may be imparted to them, in order to enable them to compete with imported labor, is reprinted from a recent issue of the *Pratt Institute Monthly*, the organ of that famous Brooklyn institution:

In the *Century* for September is printed a summary of the statistics relating to pauperism and crime prepared for and shortly to be issued by the eleventh census. These figures show that the number of white male prisoners in all the prisons, penitentiaries and reformatory institutions of the United States in 1890 was 52,894, and of this number 38,156, or nearly three-fourths, were native born. Of the total number of prisoners 31,426 had learned no trade whatever, and of these 31,426 no less than 23,144 were native born. In other words, three-fourths of those who had become criminals through lack of occupation were Americans. These are startling figures.

For years the mechanical trades of the country have been steadily passing from the hands of American born workmen into those of foreigners. As a result of this change the labor organizations of the present day are to a large extent made up of and controlled by foreign born workmen. These organizations, led by the fallacious and suicidal principle that the greatest advantage to the individual workman depends upon keeping down the number of men in the trade, have adopted and forced upon employers a system of rules limiting the number of apprentices to one or two, or, in the most liberal cases, three apprentices to one employer. As the inevitable tendency of modern

industrialism is to concentrate a large number of employees under one employer, it will readily be seen that in many of the trades this limitation is practically prohibitive. Add to this the fact that the conditions of mechanical operations to-day allow no natural place for the apprentice, that he is at the best barely tolerated and left to take his chances and pick up his trade, and it becomes evident that we have absolutely no system of supplying new material to this great army, and that the American boy is practically prohibited from learning and consequently from following a trade.

Along with this selfish and wrong headed policy observed by the trade unions is the thoroughly inconsistent one of receiving into their ranks, without protesting, every immigrant who calls himself a workman, no matter how freshly arrived or how deficient in training. Mere introduction by an acquaintance is sufficient to secure entrance to most of the unions, and the new member is forthwith entitled to the assistance and protection of the organization. This is the means of turning native born youths away, and has, undoubtedly, resulted in lowering the character of work done in the building trade, as well as in deteriorating the intelligence and character of the workmen. The narrow minded, prejudiced foreigner, fresh from the restrictions and repressions of the Old World, with its natural tendencies to socialism and anarchism, is hardly the citizen to be cultivated to the exclusion of the American born, American schooled youth brought up among the liberalizing influences of free institutions. And yet this is precisely what we are doing. With one-fifth of our entire able bodied population engaged in the mechanical arts, we have no organized means of recruiting this immense body from our native population. The result of this deplorable lack is twofold: 1. To add to the ranks of the already overcrowded occupations of clerks and salesmen, and, 2, to produce that startling increase in the criminal classes shown in the above quoted statistics. To lads brought up in enforced idleness and turned upon the world with no means of earning a livelihood, vice and crime are ever ready temptations; and the men who should be filling their places as honest American workmen find their way to the prisons and reformatories. This shutting out of our youth from their legitimate opportunities is, in fact, not only working negative harm, but also breeding positive and active evil. The actual impossibility of obtaining a trade training in the large cities through the old channels is strikingly illustrated by the case of a young man arrested in Chicago a few years ago upon some trifling charge. When asked why he committed the offense, he confessed that it was in order that he might be sent to the reformatory, where he could obtain that opportunity of learning a trade which he had in vain tried to find elsewhere.

These are the straits to which the most mechanically ingenious, the most inventive people in the world are reduced in the field which their proclivities and traditions would seem to make peculiarly their own. While welcoming the poor of all lands to their shores with open handed hospitality, and permitting them unrestricted freedom to practice their crafts, they have allowed the birthrights of their own sons to be filched away.

In the early days when the mechanic arts were in their infancy, the unformed state of society often resulted in the tyranny of one strong man over the many. To-day the workers in this field have reached another phase, the tyranny of the many over the individual—a tyranny much more fatal to moral strength and the virtues of character than ever was the older form.

The Effect of a Perpetual Wages Scale for Iron Workers.

If the proprietors of rolling mills and the Amalgamated Association of Iron and Steel Workers should finally agree that the existing scale of wages be made perpetual, only to be changed by three months' notice from either side, the beneficial effect will be so far reaching that the subject is worthy of notice in advance, and all interested should make earnest efforts to bring about such a state of affairs. The present result of negotiations has given great satisfaction in the industrial parts of the central States, but there will be still greater cause for gratification if the perpetual scale is adjusted.

The prevailing opinion among manufacturers and others whose interests are allied to the iron and steel industries is that greater stability in business will result; that there will be less fluctuation in values and an absence of that speculation in stocks of material which the present arrangement encourages. Under existing conditions, the annual July scare in regard to the probable outcome of wage conferences produces an unnecessary agitation in commercial circles, and everything runs at high pressure during several months before the time approaches, only to be followed by a distressing calm and policy of retrenchment on the part of buyers in case an amicable settlement is reached.

Consumers of rolling mill products are anxious to make certain that their orders will be filled to cover a few months' requirements in case of a lockout, and they place specifications early with jobbers or dealers, who in turn crowd the mills to their utmost capacity; but if the lockout does not take place cancellation of orders usually follows and business is thrown into a generally unsatisfactory state.

Under the new arrangement there will be a greater certainty that operations of rolling mills will continue with regularity during the year. The manufacturer will know that his stock of bar iron, sheet iron or other material which he uses can be replenished by giving a week's or ten days' notice to his jobber, and he will not have to borrow money to lay in stocks as a safeguard against July strikes. Jobbers of Chicago and the Northwest will not be compelled to place contracts for spring and summer delivery for material which they expect to sell in the fall, the quantity of which they can only guess at, as the sales throughout that territory depend, in their extent, very much upon the weather. During past years this scare has reached even small consumers in isolated territory, and cases are common where a tinner or blacksmith has placed his order for a few bundles of iron many months ahead for the sole purpose of being prepared against labor troubles. From these rivulets of commerce rivers grow, and the effect grows with the increasing volume of business. The jobbers speculate on the number of small consumers who are holding back their orders, and thus the ups and downs are caused.

Under the proposed changed conditions orders will be distributed over longer periods, and more stability to business will result. All concerned will be benefited, not omitting the iron worker, for he himself will soon concede that he is far better off if he only works four days of a week the year around than if he made full time for six months and was idle the balance of the year.

While discussing this subject the writer would ask, Why cannot the arrangement be made still more secure by making the scale perpetual and sliding? The 1½-cent card rate may soon be as absurd as the 2-cent card rate has been in the past. Now is the time for a permanent adjustment. The scale is settled until April 1, 1894; when the average selling price of bar iron or sheet iron is known for the intervening period let that price govern the ensuing three months' scale of wages, and so during the year, and, for that matter, for all time. A committee of workmen could meet a committee of manufacturers every quarter, and there would be little trouble in reaching a satisfactory agreement.

Official Report on U. S. Cruiser "Columbia."

Rear Admiral Belknap, president of the Trial Board, reports to the Secretary of the Navy in regard to the recent official trial of the United States cruiser "Columbia," that the mean speed of the ship for two runs over the measured course from Cape Ann to Cape Porpoise, under forced draft, with an average air pressure of $\frac{9}{10}$ inch, carefully calculated and corrected for tidal flow, was at the rate of 22.80 knots per hour. The board finds that the "Columbia" fulfills the contract requirements in every respect, and regards the vessel as possessing qualities of steadiness, seaworthiness and ready obedience to helm in a marked degree. Only the best material and most thorough workmanship, says the report, could have produced engines and boilers of such notable performance. In conclusion the board expresses the opinion "that, in the 'Columbia,' the service and the country have a vessel that, as a type of superior construction, advanced enginery and great speed, marks an epoch in modern cruiser design and building." The result of the official speed trial insures a bonus for the "Columbia's" builders, the Cramps of Philadelphia, of about $350,000.

Samuel C. Wentworth, superintendent of the Walworth Mfg. Works in South Boston, Mass., who died November 27, was born in New Hampshire and for 25 years was identified with Hayden, Gere & Co., at Haydenville, Mass. In 1883 he removed to Boston, to take charge of the Walworth Works. He was prominent in Masonic circles.

October net earnings of the Reading Coal & Iron Company were $358,358, being the largest net earnings for any month in the history of the corporation. It is nearly $50,000 in excess of that of October, 1892, although the ruling prices of coal at that time were 10 to 15 cents per ton higher. The company's colleries produced in October, 1893, 860,928 tons of coal, an amount only once before exceeded.

Plans are afoot for a consolidation of the surface street railroads of Brooklyn, N. Y., with an aggregate stock of $55,000,000.

THE RETAIL STORE.

The Hardware Club of New York.

I. DESCRIPTION OF PREMISES.

We give herewith detailed drawings, engraved from the architect's drawings, showing the ground plans of the premises which the Hardware Club will occupy in the near future. They are located in the upper portion of the noble Postal Telegraph Building, at the corner of Broadway and Murray streets, and were arranged specially with a view to their accommodation. Owing to law suits, fires, strikes and other delays the completion of this structure has been interfered with, but February 1 is now named as the time when the club authorities can take possession and prepare the apartments for occupation.

THE BUILDING.

As originally intended the edifice was to be 13 stories high, but as the result of negotiations between the governors of the club and the Postal Telegraph Company, a fourteenth story has been added for the use of the club, and above it a mezzanine floor for storage, and above this an extensive addition on the roof for culinary purposes, the help's dining rooms, &c. The proprietors of the building have taken pleasure in meeting the views of the club in a most liberal spirit, arranging the rooms as desired, and giving the whole an elegant finish, thus adapting the premises perfectly to the purposes of the club. In view of this fact the club would practically be no better off if they had projected and erected the building themselves, renting that part of it for which they have no use. Outside of the portion reserved for telegraph and club purposes the remainder of the building will be divided into offices.

When the club is installed in its new home it is safe to say that the members will feel amply repaid for the delay in carrying out the project in the completeness, luxury and extent of the provisions for their comfort. The conditions of the club are such also that no re-establishing of themselves in larger quarters will be necessary in consequence of subsequent growth and expansion for a long time to come. The governors and committees, under the advice of accepted authorities in positions of responsibility in the best dining clubs of the metropolis, have very sagaciously provided for the present and anticipated future needs.

It will be remembered by those familiar with the subject that when the decision was made to enlarge the scope of the membership, reserving to the Hardware and related trades the government of the club, the direction of its policy and the control of its action, gentlemen connected with other lines of business were made eligible for membership. This step was taken with a view to providing better facilities than would have been possible except with a large revenue. It was believed that very many desirable persons could thus be secured as members, and the correctness of this view has since been demonstrated by the applications which have been received for membership from many gentlemen unconnected with the Hardware and kindred lines. The great majority of the members are, however, connected with the special branches of trade for which the club is specially intended.

The building itself is centrally located in the territory in which the Hardware and Metal trades are mainly concentrated, and is also conveniently accessible to a large number of the members of the club who are bankers, financiers, lawyers and merchants identified with other lines, city officials and prominent professional men in different walks of life. Situated as the club is on Broadway opposite the City Hall, it is easily reached by surface lines and elevated railroads, and is conveniently accessible to ferries, and is also but a few minutes' walk from the terminus of the New York and Brooklyn Bridge.

From the roof of the structure, which is covered with cement walks similar to those on the street, is afforded an inspiring view of both the North and East rivers, with their enormous commerce, of the harbor and lower bay, of the Narrows, forts, islands, &c. Following the course of the East River the Long Island Sound can be distinctly seen, while the famous Palisades of the Hudson are equally near. The building itself has been constructed of the best materials in the most substantial manner, and is a splendid example of modern architecture and improved appliances for the comfort and convenience of those who are especially concerned.

The opinion is expressed by an official of one of the best known dining clubs in the city that when the plans determined on and now in course of execution are consummated, the appointments and facilities of the club's quarters will be excelled by none in New York. While essentially a dining club, it will be possible to obtain a meal there at any time during the day from 7 a.m. until 7 p.m.

Entering the building from the street one will have a choice of six luxurious elevators which run to the top of the structure. Two of these will be express elevators, making their first stop at the eleventh story. Stepping from any of the elevators one finds himself in the main hall, which is 94 feet long, and one end of which opens out into a fine balcony on the Broadway front of the building.

MAIN HALL.

It is intended to make the main hall a leading feature of the club's quarters. For a considerable distance it is 14 feet wide, but near the front at the Broadway end, as shown in the plan herewith, it becomes 22 feet. It may be said here that the entire floor will be of stone of a reddish color. The hall will be carpeted or strewn with rugs. Settees, chairs, &c., will be distributed at intervals, the walls will be hung with pictures, and the whole court made very inviting and effective. Near the entrance to the hall proper on the Murray street side will be the office, with an official in charge.

COMMITTEE AND RECEPTION ROOMS.

At the left of the hall is what may be termed a reception room, 21½ by 19 feet in dimensions, while beyond it is another room, 22 by 15 feet in size which can be used as a committee room. Both rooms are suitable for a number of uses, among which may be mentioned their adaptability for trade meetings, such as are often held in places of business, hotel parlors &c. On proper notice it will no doubt be feasible to obtain one of these rooms for such purposes, and should the meeting be protracted luncheon, dinner and supper can be expeditiously served there. Merchants will thus be free from interruption and can satisfactorily attend to the matters for the adjustment of which the meeting was called.

LIBRARY.

To the right of the hall, as shown in the plan, is the library, the greatest dimensions of which are 28 x 28 feet. This will be luxuriously fitted up with easy chairs, rockers, lounges, &c. The leading commercial, news and trade papers will be kept on file, and facilities given for correspondence or other use of the members. Here, also, it would be desirable to have for reference as complete a line of catalogues, price-lists and other trade literature as it may be feasible to collect. This room, overlooking the City Hall Park and having a southern exposure, with a view down Broadway, is not likely to prove unattractive.

LADIES' DINING ROOM.

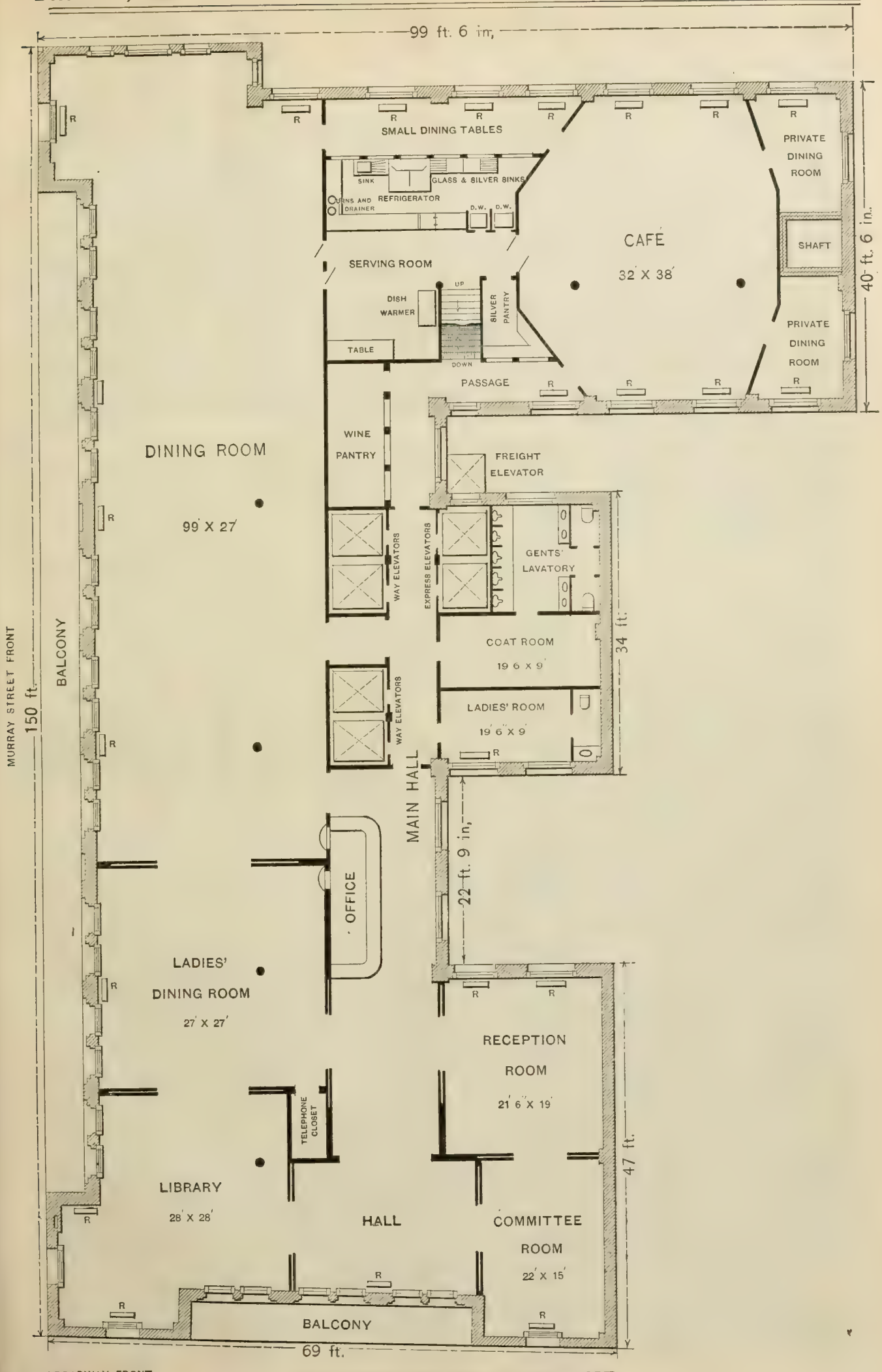
Between the library and the main dining room is the ladies' dining room, the size of which is 27 x 27 feet. The principal entrance to this room will be from the large hall. It will be remembered that the original plan in regard to these premises did not contemplate having such a room, as the amount of space available did not permit it. The enlargement of the project, however, by which the kitchen and other apartments connected with the preparation of food were put in the structure on the roof, permits this important addition to the outfit of the club, the members of which will thus have a suitable place in which to entertain the lady members of their families when in the vicinity. It is needless to say that this will supply a long felt want, owing to the scarcity of such conveniences in a purely business district.

TELEPHONE.

It will be observed that between the ladies' dining room and the main hall the telephone closet is located. The importance of this adjunct will be appreciated, and with the long distance telephone members of the club will be in communication not only with houses in the city and vicinity, but with places out of town within a constantly enlarging circle.

THE DINING ROOM.

The main dining room will have an ample capacity, being about 99 feet long and 27 feet wide. It has been estimated that this room will comfortably accommodate about 300 persons at one sitting. There are four principal entrances to this room, not to mention those leading to the serving and similar rooms. The office, it will be seen, also opens into it. In this spacious room the annual club dinner will probably be served. With the floor richly carpeted and the furniture harmonizing with the ma-



THE HARDWARE CLUB OF NEW YORK.

hogany cabinet work with which the whole premises will be trimmed, and with the extensive outlook to the South, there will be little to desire in the way of comfort and elegance. Light will be furnished from electric incandescent burners, and heat through radiators, the location of which is indicated on the diagram. Above the ceilings will be a spacious air chamber, through which air will be forced to counteract the superfluous heat during the summer months. All meal orders will be written and instantaneously transmitted through pneumatic tube service to the *chef* in charge of the preparing room. This will save much valuable time to the waiters. A glance at the diagram will discover how close contact with the serving room, silver, glass and wine pantries is secured. The table furniture will be in keeping with the character of the club as regards china, silver, glassware, linen, &c. The order for the linen, which will be of special design and will contain the club's monogram, has already been given

BALCONIES.

Before leaving this part of the building the balconies on both the Murray street and Broadway sides should not be ignored. The aggregate length of both is 156 feet; the depth 4½ and 5 feet, respectively. They are easy of access, and in suitable weather will prove an excellent place in which to sit and chat. In the summer the windows will be equipped with awnings to afford protection from the sun's rays.

CAFÉ.

Continuing the circuit, the *café* is reached from the large dining room through the passage beyond the serving room, which is 7 x 28 feet. Presumably the majority of *café* patrons will go directly to that room on reaching the club floor through the main hall, which will be the principal thoroughfare for that purpose, but the hall or court above alluded to adds to the convenience and accessibility of its location. It has been suggested that in this passage one or more tables can be placed at any time for an overflow from dining room or *café*, or for any who may prefer the isolation and seclusion thus obtained. Being near the western windows, the outlook, with a view of the North River, is an admirable one. The *café* itself is an eight-sided room, the greatest dimensions of which are 32 x 38 feet. Here a hurried or an informal meal can be enjoyed with greater freedom than would in the nature of things be expected in the main dining room.

PRIVATE DINING ROOMS.

It is about settled that the two irregular shaped rooms seen in the diagram beyond the *café* can be best utilized for private parties. Each is about 16 feet long and 8 feet wide, and if they are much sought after it is suggested that it may be necessary to charge a small amount for their use, with the purpose solely of insuring an equitable distribution of the privilege, unless some more satisfactory method can be devised.

The coat, cloak and retiring rooms occupy the whole central wing of the building in which the two express elevators are. Here also are the lavatories, closets, &c. These conveniences are, it will be observed, ample. A freight elevator adjoining this wing will be devoted exclusively to the transportation of stores, packages, &c.

SERVING ROOM.

This room, it will be observed from an inspection of the diagram, is well situated for the uses for which it is intended. There are several means of ingress and egress, and a number of pantries for silver, glass, wine, &c. Two dumb waiters also will connect these rooms with the mezzanine floor and kitchen above.

MEZZANINE FLOOR.

The mezzanine floor is located just above the serving room and under the kitchen, but isolated from both except as reached by the staircase, by which access to the roof is also gained. This floor, as indicated, will be used mainly for storage.

KITCHEN.

The diagram of the kitchen practically explains itself. In a dining club the kitchen is, of course, of prime importance. An inspection of either the plan or the room itself will convince our readers that it is exceptionally complete. If things do not run smoothly in that department it will not be owing to the lack of modern labor saving devices and the requisite paraphernalia.

II. THE MANAGEMENT OF THE CLUB.

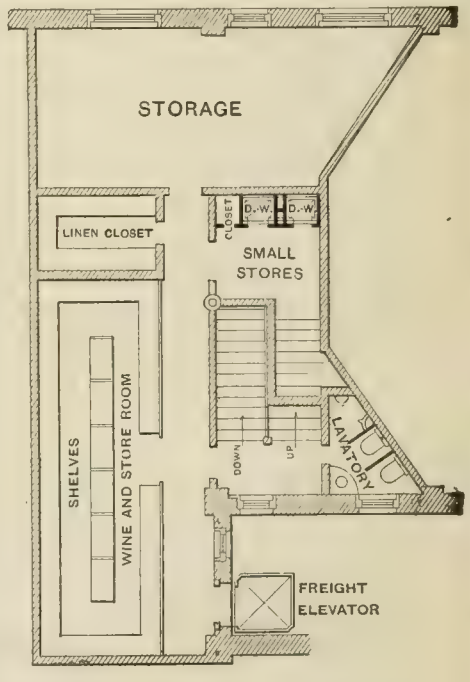
The foregoing description and the accompanying illustrations will make it evident that the premises of the club are a fitting home and center for the trade of New York and vicinity, as well as for manufacturers and merchants in other parts of the country. In this connection it is pleasant to report the hearty support which is given to the project not only by Hardwaremen doing business in the city, but also by many representative manufacturing and jobbing houses in other parts of the country and by not a few retailers. Manufacturers and jobbers of New England, Pennsylvania, New Jersey, and adjacent States are well represented, as are also some of the largest jobbing houses in the West. Among the members are also many identified with the extensive exporting interests which center in New York, and it is expected that this class of trade will be largely represented in the club. This membership is regarded as especially desirable, as it will tend to bring manufacturers directly into contact with the many resident buyers of foreign houses and with the great export commission houses who have so influential a part in the distribution of American products to all parts of the world. The presence in the club of representative bankers, lawyers, city officials and others in various branches of trade more or less closely related to Metal interests will give the club character and strength. While the number of members already exceeds 300, it should be remembered that comparatively little effort has been made to induce persons to join the club, and the limit which has been assigned to the membership will no doubt soon be reached.

FURNISHING THE CLUB.

The matter of furnishing the apartments of the club is now receiving the careful attention of the House Committee, which consists of Messrs. McCARTEE, VARICK, BISSELL, VAN GLAHN and W. H. WILLIAMS, *ex-officio*. This work will be recognized as one calling for exceptionally good judgment and taste and for which the committee is well qualified. The plans contemplate furnishing the club with an elegant and complete outfit. In the meantime the Finance Committee, consisting of Messrs. WALKLEY, OGDEN and HAYDEN, is giving attention to the financial side of the matter with a view to providing the ways and means for the carrying out of the project.

CLUB FACILITIES.

Many of the members connected with the trades to which the club is especially devoted unquestionably regard it with favor in good measure because of the opportunity it will afford for acquaintance with other persons in the trade, as it will bring them together in a very pleasant way. This, however, is only one of the advantages which the club will possess, and besides the very useful purposes which it will thus serve there are more substantial ways in which it will be of advantage to those connected with it. Many of the members will undoubtedly find their business interests promoted by the opportunity which the club will afford for meeting with the trade in the city and many outside of it who will make the club their headquarters while in town. Merchants in the city will also find the club a very convenient and pleasant place to take their customers and others with whom they may have business relations, who by their introduction may be made at home in the club and given the privileges of membership for a



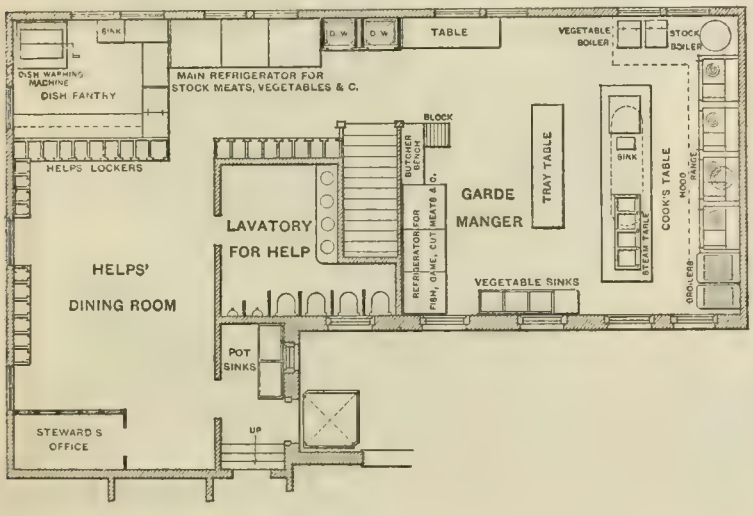
The Hardware Club.—Mezzanine Floor.

time. The rules relating to this matter have not been formally determined, but it is safe to assume that they will give the members all reasonable facilities in this direction, and thus make the club supply a want which has for a long time been felt. A similar privilege extended to non-resident members will enable them to introduce other members of their firm to the club, thus giving them an opportunity to enjoy its conveniences while they may be in the city. The carrying out of the plans which have been formed will render the club more and more a rendezvous for non-resident manufacturers and merchants who desire to keep in touch with the trade and appreciate the advantages offered by the organization. At the club can be received letters, telegrams, packages, samples, &c., appointments made and interviews had, with a certainty of always meeting at a common center a large number of persons who otherwise would have to be sought in their places of business. Arriving in town, hand packages, wraps and baggage can be left if desired, the soil of travel removed, and a meal partaken of at any

time during the day. This may occupy much or little time at the convenience of the member, while pending the preparation of the meal the intervening time can be occupied in various ways not possible at hotel or restaurant. It has, indeed, been suggested by one who looks at the thing in a very practical way that the saving to those visiting the city frequently in their hotel bills will soon more than cover the amount of the dues. Those in charge of the interests of the club recognize the desirability of having as large a non-resident membership as possible with a view to making the club as thoroughly representative of Hardware and Metal interests as possible. The more adequately and fully the trade is thus represented in the membership the more attractive and useful the club will be made.

THE DINING ROOM AND CAFÉ.

While the club will serve social purposes in a very pleasant way and be of practical business advantage, it must be remembered that it is primarily a dining club, and that it is at the noon lunch or dinner that the members will



The Hardware Club.—Kitchen.

principally be brought together. Very much of the success of the club will unquestionably depend on the attention which is given to this matter and the practical way in which the views of the members in this regard are met. It is obviously desirable that the bill of fare should be sufficiently comprehensive to enable those who desire an elaborate dinner to obtain it of the very best quality and at reasonable charges, and that others who are accustomed to take a much less formal meal shall be able to obtain it as at least as moderate a price as elsewhere and amid all the comfort and elegance of the surroundings of the club. There is undoubtedly a wide difference in the practice of merchants in this regard, some devoting a considerable time and making a substantial meal at noon, while others prefer a very simple lunch, which is not infrequently hurried. Organized as the club is for the convenience of its members, it will be necessary for it to be conducted in such a way that these diverse views may be met and all be enabled to enjoy the privileges of the club without expending more than the usual amount for lunch or dinner.

If the plans of those in charge of the interests of the organization are carried out with the wisdom and success with which they have been elaborated, it is safe to say that after the club has been in operation for a time, the trade will wonder how they ever got along without it.

XIII. VIEWS OF WILLIAM H. WILLIAMS.

A representative of *The Iron Age* called on William H. Williams, the efficient president of the Hardware Club, and was favored with the following remarks in regard to the scope of the club and the position it will assume in the trade:

It is pretty good evidence of the desirability and utility of the scheme for having here in New York a representative Hardware club that your journal, which has never encouraged visionary or impracticable enterprises, has given to the club a consistent and unwavering support since the idea was first suggested. There are many reasons for the existence of such a club which will occur to your readers, a few only of which I will mention. Many of the great industries centered here in New York have their boards of trade or exchanges where those interested meet daily either for the transaction of business or for the exchange of useful information; but the Hardware trade, which certainly is a most important industry not only in New York, but throughout the country, has never enjoyed such advantages. For obvious reasons the products and commodities in which it deals cannot well be marketed through the medium of an exchange of the character of the Produce, Cotton or Stock exchanges, but those who conceived the idea of having a Hardware club were at the time deeply impressed with the desirability of having a common and daily place of meeting, where we could get better acquainted with each other, where information affecting the various interests relating to the trade might be exchanged, and members might meet their local customers or those with whom they have business relations who are temporarily stopping in the city; where, in fact, mutual interests might be organized effectively for the common benefit of all. The most practicable means of accomplishing this seemed to be through the medium of a lunch or dining club, and the more the idea has been considered, the more confidence those who have originated it have in its feasibility. At the outset two things became apparent: 1, That such a club would be useless, or nearly so, if conducted on any other than a first-class basis, and, 2, that as the center of our trade here in New York is in close contiguity to other departments of business it would be advisable to associate with us such of the leading bankers, professional and business men in our vicinity as would be willing to join our club for the purpose of having a comfortable and satisfactory place to lunch, at the same time retaining for the club in its name and purpose the essential characteristics of a trade organization. These objects, we confidently believe, we shall attain in the really palatial home which the club has secured for itself in the new Postal Telegraph Building. A competent and well qualified House Committee has given much attention to the details pertaining to all the appointments of the club, and I am sure the membership will be proud of their club when it is fairly settled in its permanent domicile. I am very glad to see that so many gentlemen connected with our trade who only visit the city occasionally are associating themselves with the club as non-resident members. They will certainly find it a convenient place for meeting their New York friends and acquaintances, while the advantages in other respects that it will afford them during their sojourn here will, I am sure, be keenly appreciated. As an evidence of how firm a hold the idea of having such a club has upon the Hardware trade I need only refer to the fact that during the trying season through which we have just passed, which has scarcely been paralleled in the history of the country, we have not only held, but have increased our membership, and that, too, without having any regular meetings or any place for holding such meetings. In common with all the members of the club, I feel grateful to *The Iron Age* for its hearty co-operation, and am pleased to think it will find its reward in the abundant success of the enterprise which it has so generously fostered.

The Well-Informed Clerk.

WM. H. MAHER.

A firm in an enterprising town in New York lately advertised for a clerk to take charge of their grocery department, and among the qualifications necessary was this:

"One who has taste for reading the trade journals with a view to being well informed."

It would seem as if every merchant and every clerk would be only too glad to avail himself of every help in the way of education, and particularly so in the direct line of his business or employment.

One source of information is the trade journal, wherein are gathered items regarding the goods handled in the special branch of trade to which the journal is devoted, discussions upon trade matters, suggestions as to trade points, drawn from the experience of others, and gossip as to the world of business.

It matters not how thoroughly one is posted as to his own trade and locality, there is never an issue of his trade journal that will not contain that which he can read with interest as well as profit. If this is true of the merchant how much more generally it will apply to clerks!

It is the one encouraging feature to the ambitious young poor man of the present that his competitors in the ranks are so superficial, so anxious to shine to-day, and so antagonistic to hard work. A large number, a large proportion are "graduates" of a school system that teaches a smattering of everything from drawing to Greek, and teaches nothing thoroughly. The "graduate" has a fine sense of his own ability and importance and rests upon this. His place in "society" is of much greater importance to him than his position in the store, and so much of his time is taken up with his social

duties he has no hours to spare for reading either trade journals or anything else.

There is usually in the same store a young man who is too insignificant to have a place in "society." His mind is too warped to enjoy the small gossip that occupies the mouths of his more expansive companions, and his business occupies his thoughts during all his waking hours. He is the one clerk who sees the weekly trade journal; not infrequently he digests its contents better than does his employer. He thinks over the things he reads and assimilates them—makes them his own, and in due course of time is referred to by all around him for this or that bit of information.

As a salesman he is able to explain in an intelligent manner why things are thus and so. Buyers see that he knows his business and they like to trade with him.

When goods are called for that are not kept in stock, or may never have been kept in stock, he knows about them, can show where they are weak or strong, and can advise with his employer as to whether it would be wise to add them to the stock or not.

His greater knowledge of everything about the goods helps him to remember prices better, and he is hourly consulted by his associates about points in which they are uncertain. Whatever changes are made in the force he is sure of his place until the day comes when he has a store of his own or is given an interest in the firm.

It is not the brilliant fellow that succeeds. When he does he is the exception. It is the plodding man, who is thorough, careful, intelligent.

When I was a salesman on the road and, upon entering a store, saw the trade journal unopened, circulars and price-lists unread, I always knew I might ask good prices with safety. On the contrary, where I saw the trade paper open at the desk I felt my way carefully to discover what prices I might get.

To-day the trade journal has a much more distinctive field than it had 20 years ago; it is less a mere price-list and more an intelligent friend. No merchant can afford to discard its help, and no clerk should miss the opportunity of going to the school that it conducts for his benefit. But this article is not written to increase the circulation of trade journals; it is to emphasize the benefit of being a well informed clerk. Trade journals are one medium through which he can inform himself, and they ought to induce him to try further fields of reading.

One of the best salesmen that I ever met was one who always carried an educational book in his gripsack; when he had to wait for a delayed train or had an hour to spare at the hotel he had his book in his hand.

I found him a pleasant companion and so did his customers. He was respected and liked by all who knew him, and deserved the success that came to him later. He was a well-informed man; interested in everything worth a man's thought, with no time to waste over billiards or barrooms or worse things.

One of the high salaried men that called on me from New York had the faculty of picking up the latest story and repeating it to perfection. He was equal to many men on the stage. But if I asked for specific information about an article in his line he could not give it; he had the sample and there was the price; he could tell a good story and was free in paying for refreshments, if you would have them, but beyond this he had nothing.

I was not surprised when his employer told me that he would be allowed to resign at the end of the year. Said he: "He sells less each trip. Everybody likes him and speaks well of him, but each time they see him they buy less of him."

I thought I understood the reason. Stories are good in their way; cigars and wine influence some, but, after all, men think, "business is business," and they want to buy of a man who understand his goods from A to Z.

It is for this reason that merchants are looking around either for well-informed clerks, or for those of such frame of mind that they will inform themselves as they grow in business. If the desire is there the rest will follow.

Twenty-five years ago a young man worked in a stove store next door to me. He worked hard, too, for he had to run stoves out and in, black stoves, set them up, and do anything and everything needed to be done. Shops in those days kept open till 8 o'clock every evening, and were opened early in the morning. But this young man found time to study up everything connected with stoves and tin. By and by, with a very few hundred dollars and some credit, he opened a shop to make tin cans, and to-day he is at the head of the largest factory of this kind in all the world.

He read and studied "with a view to being well informed," just as the New York advertisement wants a young man to do, and his information became valuable capital.

The young man of to-day should take courage and press on in the same direction. Well-informed men are needed, always will be needed, and will always get to the top.—*Trade.*

Pittsburgh Mammoth Lamp Fount.

The Pittsburgh Brass Company, Pittsburgh, Pa., with New York office 36 Park place, are offering the Mammoth lamp fount herewith shown. The lamps are made in three sizes, the largest size, known as No. 3, being shown in the cut. This fount, it is stated, holds over 8 pints of oil, sufficient to yield a brilliant white flame for over ten hours. All sizes of founts are furnished with an indicator, represented by the dial in Fig. 2. The pointer of the dial is attached to a spiral brass ribbon, incased within a brass tube. A float on the tube engages with the ribbon and turns the pointer as it rises or falls with the oil. It is explained that the dial shows at a glance not only when the fount is full, thus removing danger of overflowing when filling, but also indicates the exact quantity of oil in the fount at all times. The founts may be stood on the base or used in connection with a harp. It is claimed by the makers that the lamp gives a large amount of light, that it is clean and easy to manage, that it does not break chimneys, and that it burns a long time without refilling.

Fig. 1.—Pittsburgh Mammoth Lamp Fount.

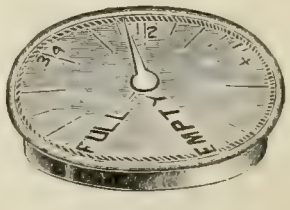


Fig. 2.—Indicator Dial.

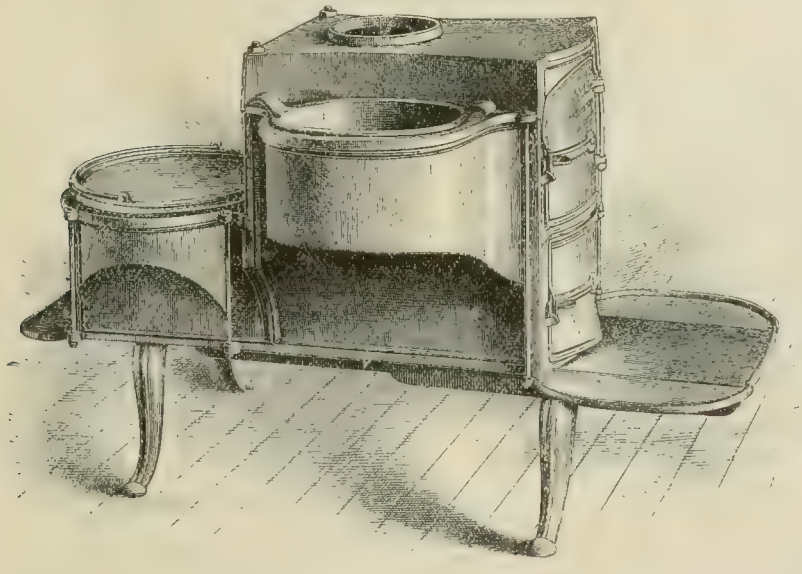
Sealed proposals will be received at the office of the Supervising Architect, Washington, D. C., until December 15 for work on the United States Custom House and Post Office Building, St. Albans, Vt., the work to include the roof construction and roof covering. Drawings and specifications may be obtained from the Superintendent at St. Albans or of the Supervising Architect at Washington.

Japan is to have a National Industrial Exhibition in 1895, to be divided into seven sections, namely: Industry; art and art industry; agriculture and horticulture; marine products; education and science; mining and metallurgy, and machinery.

STOVE TRADE NOTES.

The Conant Stove.

We are indebted to the Fuller & Warren Company, Troy, N. Y., for the photograph of an old stove from which the engraving here presented was made. The company state that the stove illustrated is at present the property of a customer named G. W. Tillotson of Northfield, Vt., and they write for information as to the date the stove was made. It has on each side of the body an oval boiler hole, in which fits a kettle. The products of combustion pass under and around the kettles, thus heating them on all sides. There is a hearth at each end of the stove as well as a door at both ends of the fire box, so that a fire can be had under the large griddle as well as under the oven and kettles, the latter being provided with cast iron covers. When the stove was new Mr. Tillotson states that there were several reducing rings for the large griddle hole, bringing it down to about 7 inches. The oven has a door at both ends.



General View of a Conant Stove.

With regard to this stove, which was made under Conant's patent, we take pleasure in presenting the following extract from the Vermont *Historical Magazine*:

In 1820 John Conant erected the furnace in the village of Brandon, Vt., the first blast of which was made in October of that year. At this furnace was cast the old Conant stove, the first made in the State and a great invention for the time, and which was the wonder of the farmer's kitchen, and sold in all the villages around and abroad till the more convenient rotary came in for competition. It was the first stove we ever saw—our father bought one and brought it home as a surprise—and never was anything brought into the house that created such an interest. It was the inauguration of a new era in the culinary kingdom. The pleasant old fire place with the swinging crane of well filled pots and kettles, hearth spiders with legs and bake kettles and tin bakers to stand before the blazing logs and bake custard pies in—all went down at once and disappeared before that first stove, without so much as a passing struggle. We do not know whether there has been one kept in the State to this day.

Since the above was in print we have received the following from John A. Conant, son of John Conant: "You are right in saying that the old Conant stove was the first cooking stove made in the State. Stoves with ovens but without boilers, &c., had been previously made to some extent.

"The State was being supplied with cooking stoves previous to 1819 by a house in Troy, N. Y., who had their castings made in Philadelphia. The Conant stove, and others that soon followed, took the place of the Troy pattern.

"The first Conant cook stove was made in the autumn of 1819, castings for the same having been obtained from the Pittsford Iron Works. The work of erecting a blast furnace in Brandon was going on at the same time, and resulted in supplying a superior quality of iron for stove making. Unlike most of the furnaces, the castings for stoves, potash kettles, and almost every variety of iron castings were made directly from the brown hematite ore of the regions. The business proved a success and was prosecuted by father and sons for a period of 30 years, and was the life of the town."

ODD PLATES.

Fuller & Warren Warming and Ventilating Company received from the commissioners of the World's Columbian Exposition a blue ribbon premium for their school warming and syphon ventilation, which they exhibited. The firm are distributing *facsimiles* of these ribbons to their friends in the trade.

The Pittston Steel Range Company is the name of the concern organized a short time ago at Pittston, Pa., for the manufacture of steel ranges. The company have secured temporary quarters in a building on South Main street, where machinery is being installed as rapidly as circumstances will permit. We understand, however, that the company are negotiating for the purchase of a piece of ground on the west side, where they contemplate erecting a large foundry. The board of officers consists of Dr. Joseph C. Reap, president; Dr. George B. Reap, secretary and treasurer; James Kennedy, manager and superintendent of the foundry department, and John Brown, superintendent of the mounting department. Mr. Kennedy spent the greater portion of his life in the foundry business, and brings to his new position a practical experience which eminently fits him for the place. He learned his trade in the Exeter Machine Shops, West Pittston, and was for a number of years foreman of the Pittston Stove Works.

An attractive folder with deep red borders reaches us from the Barstow Stove Company of Providence, R. I. On opening the folder we find the statement that "this talk about business depression is getting to be an aged chestnut," the idea being forcibly conveyed by a sample chestnut fastened in its proper place on the cardboard by means of a thread. After this the reader is requested to get a new subject, and Thanksgiving Day is suggested as one appropriate for discussion. In this connection reference is made to the thousands of turkeys that will be roasted in Barstow Bay State ranges on that day, and "by the way," says the folder, "don't you need one or two Bay States in anticipation of the trade which precedes this holiday?"

The Schneider & Trenkamp Company of Cleveland, Ohio, have issued from the press a neatly printed and well arranged catalogue and price-list of Reliable gas stoves, which they manufacture in great variety. This is the seventh annual catalogue which the company have issued, and in their announcement to the trade they say that nothing has been spared in remodeling the entire line of Reliable goods to make them first class in every particular. Among the numerous improvements which they have made for the coming season, particular attention is called to the fact that all Reliable Junior stoves will be made with a lay down tank, for which there will be no extra charge. In the early pages of the catalogue 11 reasons are given why the Reliable generator is the best, following which are various illustrations of the device named. Directions for ordering repairs for Reliable Process stoves are presented, together with a price list and suggestions with regard to the proper manner of taking care of a generator gasoline stove. The Reli-

able Process for 1894 is first illustrated and described, followed by other leading specialties which the company manufacture. These cover a wide range and include constructions adapted to meet all reasonable requirements. Attention is also given to paint burners, plumbers' furnaces, individual burners, gasoline and oil torches, stewpans, steam cookers, sad iron heaters, gas radiators, parlor gas grates. &c. A telegraphic code, followed by several blank pages for purposes of memoranda, complete the work.

F. & L. KAHN & BROS., Hamilton, Ohio, send us a postal card, on the back of which is an illustration of the F and G series of the Estate Oak heating stove. The manufacturers refer to these goods as the "World's Fair Winners," they having received awards at the World's Columbian Exposition. The stoves are made with jointless ash pit and screw registers, and are offered the trade in 28 different styles and sizes.

M. A. MURRAY of Cold Spring, N. Y., one of the customers of Rathbone, Sard & Co., has lately shipped an Acorn stove to France.

THE RICHARDSON & MORGAN COMPANY, 92 Beekman street, New York, report a satisfactory trade on both Puritan ranges and Cyclone hot air and hot water apparatus during the fall.

E. C. MUCKLE, superintendent of the furnace and range department of Janes & Kirtland, 110 Beekman street, New York, reports an unusual demand for their line of the Beebe ranges and furnaces. They have a large force at present engaged and their foundry is taxed to its utmost capacity.

ONE OF THE MANY ADMIRERS of the Michigan Stove Company is T. J. Welch, Colchester, Ill., who has adapted the famous song "After the Ball" to reciting the merits of the Garland stove. The story is told in clever verse and is all about an old man's early love affair that turned out disastrously through his failure to appreciate the merits of the Garland stove. The "she" of the story wanted one of these famous cookers, but he resisted and got some cheap thing instead. The poor girl died within a year and the old man was left to the companionship of regret and the cheap stove. We quote the chorus that ends the three verses:

After the dinner's over, after the baking's done;
After the neighbors leave, after the friends are gone;
Many a heart is aching, many a wild thought rove;
Many the hopes that vanished for lack of a Garland stove.

THE COLD WEATHER prevailing in Northern New York is proving a great help to the stove business. The manufacturers of stoves at Albany, N. Y., report business as being fair. They expect it will receive a great impetus if the cold weather continues.

MANUFACTURING at the plant of the Perry Stove Company, Albany, N. Y., is moving along briskly, and the force is busily engaged in turning pig iron into the fine brand of goods known as Argand stoves and ranges.

PRESIDENT JOHN F. RATHBONE and Vice-President Grange Sard of Rathbone, Sard & Co., Albany, N. Y., are members of the Citizens' Committee of that city recently organized to promote the purity of elections and convict the perpetrators of ballot box frauds.

PRESIDENT JAMES E. ROACH of the State branch of the International Molders' Union, addressed Molders' Union No. 2 at Albany, N. Y., November 24, on the condition of the molders' trade throughout the State. He said he had received reports from all the unions in the State and they showed that work was slow, foundries employing small forces and working on short time.

VAN LEYEN & HENSLER of 149 Jefferson avenue, Detroit, Mich., favor us with proof impressions showing some of the work they have recently executed in different branches of engraving, of which they make a specialty. This concern is well known among the leading stove manufacturers of the West for the very creditable work which they have produced in the way of illustrations of stoves, ranges and heaters. Our readers will be able to judge in some measure of the character of the work turned out from an inspection of the catalogues issued by such houses as the Peninsular Stove Company, Detroit Stove Works and the Michigan Stove Company, all of Detroit.

THE ART STOVE COMPANY of Detroit, Mich., have been doing a very good business with the Home Laurel range, which they placed upon the market early in the season. It is a high class six-hole construction of rich ornamentation, and combines the modern features of utility and durability. Among the points of merit to which the company refer may be mentioned large, deep fire box, improved duplex grate, large draw hearth, capacious ash pan, patent oven door kicker, nickel plated open shelf, satisfactory flue construction and nickel panels on the oven door, carrying medallion tile. The company report general business as good, and state that they are now working upon new patterns for next season's trade. They propose to bring out an entirely new line of stoves and ranges which will be second to none.

THE CORTLAND HOWE VENTILATING STOVE COMPANY of Cortland, N. Y., are the subject of a very complimentary article which appeared in the Cortland *Standard* for November 15. It is entitled "Laurels of a Year," and describes at some length the record of medals and premiums awarded the company for their ventilating stoves during the recent past. The record begins with the award of a gold medal at the Triennial Exhibition of the Massachusetts Charitable Mechanic Association, held in Boston in October and November last year; then follows reference to the award at the World's Columbian Exposition, premiums at various New York State fairs, and then winds up with a list of scientific experts who have examined and indorsed the stove.

THE QUICK MEAL STOVE COMPANY, St. Louis, advised us that their new style Quick Meal gasoline stoves would be ready for shipment on December 1. They have booked seven carloads for shipment on that date, and expect to increase it by several more. Their catalogue is in the hands of the printer and will be ready for mailing to the trade in a very short time.

THE EXCELSIOR MFG. COMPANY, St. Louis, Mo., are sending out an announcement in the shape of a small circular of a brilliant red color, calling the attention of the trade to the fact that Christmas is coming. They follow up this information with a few remarks concerning their Charter Oak toy stoves, which are guaranteed to operate perfectly. Many dealers are ordering samples for window display, and, while the stock is still in good shape, the Excelsior Mfg. Company urge dealers to order early, as the next few weeks will cut down their stock very materially.

COL. JAMES A. SEXTON of the firm of Cribben, Sexton & Co., Chicago, will shortly be found at his old desk puzzling over the details of the stove business. For four years he has been serving his country as postmaster of Chicago, and according to common report he has done it well. He has had a hard time trying to leave the office, having resigned on March 7 last, but complications arose over the appointment of a successor, which delayed the acceptance of the resignation until a few days since. An editor, Washington Hesing of the Chicago *Staats Zeitung*, steps into his shoes. For some time Colonel Sexton has been talking of his longing to get back into the stove business, and to be freed from the trammels of an official position, but we are privately of the opinion that he won't find quite as much enjoyment in the stove trade in its present condition.

THE MICHIGAN STOVE COMPANY favor us with one of their famous "Shut-the-Door" bull dogs. This sign must be a terror to the small boy who never shuts the door. We have also received from the company a huge card, evidently intended as a mammoth postal card. The reverse side is a vivid scarlet, on which are printed interesting references to Garland stoves and ranges.

THE FULLER & WARREN COMPANY of Milwaukee and Chicago issue a very neat illustrated circular, printed in two colors, calling attention to their Stewart stoves, of which they say more than 2,000,000 are in use. A portrait is printed of P. P. Stewart, the originator of these stoves, who began to make them in 1831. The stoves referred to are the P. P. Stewart base burner improved for 1893, the new Splendid Stewart base burner, and four styles of P. P. Stewart stoves with round and square sheet iron bodies.

H. RENDTORFF & Co., 16 Lake street, Chicago, are displaying on their sample floor specimens of the Weir Stove Company's new Glenwood H range. This range is a distinct departure from the usual style of decoration. Instead of nickel plated or polished edges this range has black edges, with nickel plated corners inserted. These corners are on the top, hearth and oven shelf. They brighten up the range, in strong contrast with the black body, and the general effect is very pleasing. Messrs. Rendtorff & Co. are pushing the sale of their 1893 Ideal Oak, which they offer in four sizes.

THE BRAND STOVE COMPANY of Milwaukee are closing their Chicago warehouse, but will probably maintain an office in the latter city. They find that with their foundry in Milwaukee they are sufficiently close to make shipments promptly to their Chicago trade. De Witt Van Evera will attend to Chicago business, as heretofore.

EDMOND RAFTERY of Rathbone, Sard & Co.'s Chicago house has spent the past month in Colorado for the benefit of his health, making his headquarters at Glenwood Springs. At last accounts he was able to walk 20 miles a day with ease, so that he seems to have regained his vigor.

The Prepayment Gas Meter.

The following is a portion of a paper read by Geo. Keillor before the North British Association of Gas Managers:

As requested, I have prepared a few notes on the prepayment meter system, with the view of bringing the subject before you for discussion; but having had these meters in use for only about a year, I am afraid my short experience may be of little service.

This prepayment adaption to the ordinary meter may be said with truth to be another step in the right direction. The system has already been rewarded with very great success; and it is rapidly finding favor among the poorer class of gas consumers. By this arrangement, "a long felt want" has been supplied. It is indeed a friend to the poor, and completely eclipses the old, but true, saying "Short accounts mak lang friends."

I may here state that at a meeting of my directors held in March, 1892, I had a meter fitted up in the secretary's office by which it was shown how a pennyworth of gas could be bought and afterward consumed. The chairman expressed great satisfaction with the arrangement, and said he considered the coin meter to be the best invention he had yet seen for the poorer class of consumers, and to keep gas companies from making bad debts.

A short time after this 12 of these meters were ordered, so that I might experiment with them. These have now been thoroughly tested; and I am pleased to inform you the results were very satisfactory, and also that my anticipations, formed with regard to the quantity of gas consumed and the corresponding pennies in cash boxes, have been more than realized. I may, however, state that I had very grave doubts as to the meters possibly being troublesome to consumers, by the light going out at a busy moment, or that the slot arrangement might get out of order, and so pass a greater quantity of gas to the consumer than the money value in the cash box; but in practice I find these apparent doubts and inconveniences entirely disappear. The consumers get so well acquainted with the working of the meter, and the time their one, two, three or more pennies' worth will last, that they like the system, and are put to no inconvenience whatever. On one occasion only had I to take in a meter which ceased to give light; the cause of which was found to be a penny stuck in the slot—the penny having been, by some youth, hammered into an irregular shape—which necessitated our taking the cover of the meter off. Makers should therefore enlarge the slot a little, as it is not necessary for it to be the exact size to admit the coin.

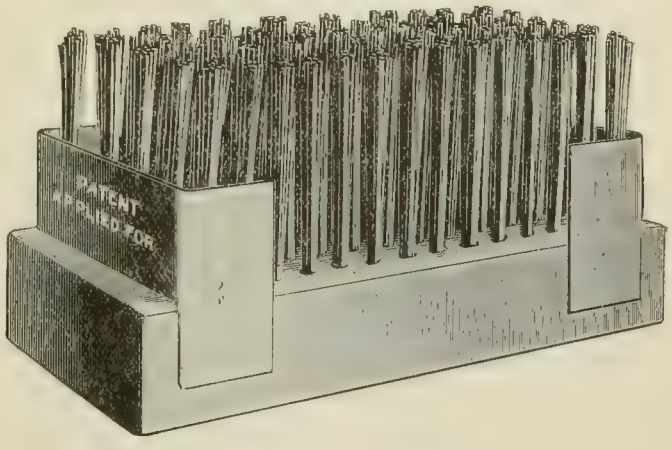
When ordering these 12 meters it was not my intention at first to press for new consumers, and, of course, we had no applications for them. But it occurred to me that rather than give them out to new consumers to commence with, I might select 12 ordinary small consumers, who were all more or less in arrears, and, consequently, would have been more than likely to have their gas supply cut off. Rather than do this, and very probably lose all, I used some liberty with these defaulters by way of making an experiment with the prepayment meter. Most of them were glad to get such a meter, while several others absolutely refused to allow their meters to be shifted, and declared if such were done they would commence using oil. Notwithstanding these remonstrances I insisted on having the meters put in, and, strange to say, on making our periodical calls three months after we did not find oil in use, neither did we find the cash boxes by any means empty. On the contrary, nearly double the quantity of gas had been paid for than would have been consumed by the ordinary meter, and this without a word of complaint. One consumer remarked: "I doubt you have given me a stick to break your own back with. You will not get me overcharged this time as you did the three corresponding months last year. I have only put in a few pennies each time I needed light, and that was no oftener than I could help." However, on reading the meter, the inspector considered that if the pennies in the box agreed with the number of feet registered, the gas company would have no reason to complain, and the consumer also was, apparently, well satisfied. The result was 12 shillings in the box, as compared with 7 shillings and 6 pence the corresponding months complained of.

I have now only to say that gas companies and corporations ought to give notice, by advertising or otherwise, to all proprietors, architects and builders, that when erecting new buildings or when altering old ones, the gas company will supply automatic meters, to be fitted into all workmen's houses. Also that when architects specify the plumbing and gas fitting work, it should be specially mentioned in the specification to the effect that a meter and suitable gas bracket will be fitted up complete by the gas fitter, after which the gas company would send an official to instruct the tenants as to the working of these prepayment meters. In Nairn, among other buildings, I did the architectural work in connection with a block of houses where there are 12 tenants. In the specification of plumbing and gas fitting work it was specified that one automatic gas meter must be fitted complete into each house, the meter to be supplied by the gas company and fitted in by the contractor. I knew very well that none of these tenants had any intention of using gas when they rented these houses—most of them, in fact, informed me they did not want the meter placed. But on discussing the matter with them, I said it was a part of the gas fitter's duty to fix these meters and that they had just better allow them to be put in in the ordinary way. I also took the opportunity of saying that perhaps the first time they were out of oil, or it might be a lamp chimney got broken, they might for a change put the value of the new lamp chimney in the slot of the meter, and by so doing they would come to see how handy and ready the gas is when obtained in this way compared with oil. I remarked that ultimately I expected to see an ornament on each of their shelves in the shape of an oil lamp.

Well, whether you believe the system to be just as successful as I do or not—a great deal of which success depends on gas managers themselves—there is one thing certain, that the cleanliness, readiness, and easy purchase of the light by this system will go on finding favor among the poorer classes; and I most certainly recommend the system wherever gas is used. And, further (more especially in small towns), I would say, should this class of consumer not get the opportunity to use gas by this system we shall be guilty of what I am afraid we too often are—viz.: "standing in our own light."

Steel Wire Brush.

This steel wire brush for cleaning castings is made by the S. Obermayer Company of Cincinnati, Ohio. It will be noted that there is a sheet metal strip inserted in each end of the block and which by the protection it affords the wires adds to the durability of the brush. It is stated that the wire will not break, and that it will wear down to the block.



STEEL WIRE BRUSH.

Last year about 1,250,000 tons of cotton seed were crushed in the United States, from which were extracted 1,000,000 barrels of oil. A Southern journal shows where the bulk of this product goes, as follows: Chicago pork packers buy 300,000 barrels, most of which is made into lard. Maine sardine packers use 20,000 barrels. Between 50,000 and 100,000 barrels are consumed by various soap makers. Between 200,000 and 300,000 barrels go to Europe, where it is made into "butter."

Unemployed workmen are flocking from the small towns and country districts into the large cities, hoping to get work. As in most of the cities it is a difficult matter to provide for their own unemployed, this fact is naturally a cause for complaint. New Orleans, Pittsburgh and Indianapolis are among the cities suffering from this invasion.

TRADE REPORT.

The Iron Market.

The shock which the Iron trade has received through the publication of the Wilson tariff bill has staggered even those who were ready to admit that the industry could stand a conservative readjustment of rates. It has startled them out of their fancied security.

The belief is gaining ground, however, that the bill has no chance of passing as at present framed, because it attacks indiscriminately interests in sections of the country whose loyalty to the framers of the bill must be retained to carry it through.

The immediate effect upon business cannot help being bad. The early date named for its going into effect must act to deter buyers from covering spring and summer requirements. It seems likely to confirm purchasers all along the line in a policy of keeping supplies down to the minimum.

A heroic effort is being made on the part of some of the Southern furnaces to advance the price of Pig Iron. The chief basis for this standing out for more money seems to be that considerable sales have been made lately, and that they include speculative purchases. Whether this advance will be actually secured depends upon whether other producers in the South and in Northern districts will see fit to cover the current demand at old prices. As yet no serious disposition has been shown to follow the leadership of the large companies in question.

Pig Iron.—Reports of additional sales of Southern warrants to speculative buyers are current in the New York market. Some of the leading Southern producers are making an effort to secure better prices, but in this market no advance has yet taken place, since a good deal of cheap Iron is still offering. We quote: Northern brands, $14 @ $15 for No. 1; $13 @ $14.25 for No. 2, at tidewater. Southern Iron, same delivery, $13 @ $14 for No. 1; $12 @ $13 for No. 2; $11.50 @ $12.25 for No. 3; $11.75 @ $12.25 for No. 2 Soft, and $12.25 @ $12.50 for No. 1 Soft.

The demand for Pig Iron is not specially urgent in the Philadelphia district, but consumers are getting so short of stock that orders are more frequent, if not large. It is thought that there will be a pretty active business after the turn of the year, as stocks are unusually low and requirements will probably be larger than they have been during the past six or eight months. At the present moment, however, there is no trouble in placing orders at the lowest figures of the entire year, although there is no pressure to sell and less chance for concessions than there was some time ago. General quotations for Philadelphia or near by deliveries are about as follows:

No. 1 Foundry	$13.75 @ $14.25
No. 2 Foundry	13.00 @ 13.25

The most important occurrence in the Chicago market has been an effort of some large Southern companies to put a check to the lowering tendency in prices by asking an advance of about 50¢ ℔ ton. Quite a number of foundries making specialties are getting ready to start in December, while general jobbing foundries are almost all again in operation, although working only part time or with part of their force. Quotations are now as follows for cash:

Lake Superior Charcoal	$15.50 @ $16.00
Local Coke Foundry, No. 1	13.50 @ 14.00
Local Coke Foundry, No. 2	12.75 @ 13.00
Local Coke Foundry, No. 3	12.25 @ 12.75
Local Scotch	14.00 @ 14.50
Ohio Strong Softeners No. 1	15.50 @ 16.00
Southern Silvery, No. 1	@ 13.75
Southern Silvery, No. 2	@ 13.25
Southern Coke, No. 2	11.85 @ 12.10
Southern Coke, No. 3	11.10 @ 11.35
Southern, No. 1, Soft	11.85 @ 12.10
Southern, No. 2, Soft	11.10 @ 11.35
Tennessee Charcoal, No. 1	16.00 @ 16.50
Alabama Car Wheel	18.25 @ 18.50
Jackson County Silvery	16.00 @ 16.50
Other Ohio Silvery	15.00 @ 15.50

Pittsburgh advices indicate no improvement in the Pig Iron market since last report. Prices, if anything, are a shade weaker, due largely to some recent sales of Valley Iron, at a heavy loss to the seller, and at prices much lower than any Pittsburgh makers care to accept. While it is true that more Pig Iron is being consumed now than at any time since July, it is also true that there has been a large increase in production, owing to the recent blowing in of several stacks in the district. Quotations are as follows, for cash: No, 1 Foundry, $12.50 @ 13; No. 2 Foundry, $11.50 @ $12.

The increase in the volume of business in Southern Pig Iron markets keeps up well. During the past week it was much larger than in the preceding week. An advance of 25¢ ℔ ton is asked and obtained for spot and early future delivery, and a still further advance would have to be paid for delivery next spring. Furnaces have recently sold more Iron than they have made, and there is some scarcity in one or two favority grades. There is nothing doing in No. 1 Foundry, and scarcely any movement in Charcoal Iron. Quotations are given as follows:

Southern Coke, No. 1	$12.25 @ $12.50
Southern Coke, No. 2	11.00 @ 11.25
Southern Coke, No. 3	10.50 @ 10.75
Ohio Soft Stone Coal, No. 1	15.50 @ 16.00
Ohio Soft Stone Coal, No. 2	14.50 @ 14.75
Lake Superior Coke, No. 1	15.00 @ 15.25
Lake Superior Coke, No. 2	14.00 @ 14.25
Hanging Rock Charcoal, No. 1	18.50 @ 19.00
Hanging Rock Charcoal, No. 2	17.50 @ 18.00
Tennessee Charcoal, No. 1	14.00 @ 14.25
Tennessee Charcoal, No. 2	13.00 @ 13.25
Standard Southern Car Wheel	17.75 @ 18.00
Lake Superior Car Wheel and Malleable	17.00 @ 17.25

Metal Market.

Pig Tin.—For spot stock and on deliveries running during the balance of the year, prices have been well maintained on the basis of about 20.65¢. Speculation has remained almost at a standstill, and regular operators, as well as outside interest, seem to have virtually withdrawn pending the fate of the new tariff bill. The jobbing and consumptive demand has also been on a moderate scale, but the best information on the subject goes to show that steady inroads have been made upon spot stocks, and that the distribution exceeds the combined total quantity afloat and the importations since the McKinley duty went into effect. Along with the fact that stocks in Europe have been steadily increasing this would suggest more than a bare possibility of some lively speculative movement in the event of the present duty being removed. Estimates as to the present supply of Pig Tin in this country vary from 2500 to 5000 tons, including several hundreds of tons now in bond. The lesser figure is, however, generally taken as being nearest the mark. Jobbers' prices for small lots remain unchanged at the rates quoted last week; namely, 21½¢ @ 22¢ ℔ lb for Straits Pig and 22½¢ for Banca.

Copper.—No large sales of Lake Superior Ingot have been reported or even rumored, but brokers have been supplied with orders to bid stiff prices, not only on Exchange contracts, but on actual Copper for near future delivery. In some quarters it was claimed that 5,000,000 lb or any part would have been taken at 10¢. Elsewhere *bona fide* bids of 10⅛¢ for moderate quantities were turned down. On the Metal Exchange a trade was recorded involving 50,000 lb, for delivery during the latter part of December, at 10⅛¢, but reliable information went to show that several prominent producers were willing and ready sellers at that rate for delivery during the first quarter of next year. There is a "bullish" tendency to make the most of all the best features prevailing, but enough legitimate demand exists to give the market a good tone. Jobbers report an improvement in the

demand over the previous week, and inquiries received by them tend to be of a more important character. Quotations for small retail quantities are given at 11¢ for Lake Superior Ingot, 10½¢ Ansonia grade Arizona, 10¢ Ansonia grade casting.

Sheet Copper.—The interest in Manufactured Copper is good for the season of the year and prices have stiffened. Stocks are low with both jobbers and consumers, and it is believed that the conditions exist for a good trade after the turn of the year, when consumers are able to arrive at the probable extent of their wants for spring business. Meanwhile, prices remain unchanged per list, but dealers are not eager to take much forward business on the present basis, anticipating an advance in rates in the near future.

Pig Lead.—There has been somewhat freer offering, due partly to slow condition of trade latterly and partly to some uneasiness over the provisions of the new tariff bill, which proposes to reduce the duty on Lead. Under the weight of the two circumstances selling price has dropped to 3.40¢. Carload and larger lots have been offered at that rate for delivery up to the balance of the year. At the present there seem to be no buyers at above 3.35¢, and few at over 3.30¢. The market thus has a weak as well as a dull appearance in the face of all the bullish speculative manipulation and argument that has been brought into play during the past two weeks. The general consumptive demand shows no signs of greater activity, jobbers reporting business in this metal as exceedingly dull. American Pig in small lots, less than a ton, is quoted at 4½¢ @ 4¼¢ ℔ lb.

Lead Pipe and Sheet.—Business in Manufactured Lead and Plumbers' Supplies is of the slightest nature. Nor is any material improvement looked for until the spring. List prices in the East are still nominally held to with firmness, but it is an open secret that shading of rates can often be secured on desirable orders.

Spelter.—Under the influence of good demand from Western consumers, along with about average buying in this city and vicinity, the market shows better form and closes quite firm. Single carload lots of ordinary Western went at 3.75¢ @ 3.85¢ for prompt and near future shipment. The latest sales were at the higher price. That is now bid, and in remote instances offers were made as high as 3.87½¢ for ordinary deliveries. Spelter, in fact, after a long period of neglect, appears to have again attracted the attention of speculators for some more or less occult reason. For moderate jobbing quantities of Western Spelter the quotations are 4½¢ @ 4¼¢ ℔ lb, with only fair demand.

Tin Plates. Business has been uneven and somewhat slow, and the market is bare of any particularly encouraging features. Spot goods are taken in small quantities only as immediate requirements dictate, and interest in future deliveries appears to have slackened down. Sufficient jobbing business in the way of spot sales is, however, moving to keep the trade from anything approaching stagnation. The total volume of negotiations for the week, however, hardly approaches the average for this season of the year, and as the season for stocktaking and adjustment of accounts is approaching, it is hardly likely that any tangible revival of interest will develop until this annual duty is accomplished. The proposed Tariff changes, too, will probably serve to still further depress the trade until it is known exactly what the ultimate arrangements will be in regard to the duty on Tin Plates. The proposal as it at present stands is generally regarded in the trade as a most mischievous one—namely, to charge an ad valorem duty in place of a specific tariff, thus leaving a wide margin for fraud and misrepresentation, and involving a complete revolution in the business methods and arrangements of the trade.

It is strongly believed that the clause of the Wilson bill relating to Tin Plates will not pass the Legislature in its present form, but the fact of the proposal having been made, and that there is a probability of its being carried into effect, will operate as anything but an encouragement with the trade. Uncertainty and want of confidence must prevail to the depression of business until the matter is settled. Imports of Plates continue to be on a very moderate scale, notwithstanding the extreme lowness of prices on the foreign market, which would, ordinarily, be an inducement to American importers. Prices are soft, although showing no radical change. Later in the week some very good sales of Coke for future shipment were reported. Consumers are, however, remarkably backward in placing their respective orders in view of probable tariff changes making material alteration in values of Plates in the near future.

A cable despatch from London to *The Iron Age*, dated November 29, reports the British Tin Plate market as dull. Prices were weak and irregular, and orders scarce. Many works are idle and others only partially employed. Liverpool quotations for Plates were at follows:

IC Charcoal, Alloway grade	12/6 @ 13/
IC Bessemer Steel, Coke finish	11/3 @ 11/6
IC Siemens " " "	11/6 @ 11/9
IC Coke, B. V. grade, 14 x 20	11/3 @ 11/6
Charcoal Terne, Dean grade	11/ @ 11/3

Sheet Iron.—Black Sheets are almost entirely neglected. Jobbers and consumers appear to have secured sufficient stock to last them for some time to come, and this condition, combined with the recent settlement of the Sheet scale and the subsequent starting up of some further mills, has given softness to prices. Black Iron can without much difficulty be obtained even in small lots at anywhere from 2½ % to 10 % lower than quoted prices, provided spot cash or other inducement be offered. Galvanized Iron continues in good demand. An augmentation of production has obviated all present risk of scarcity in this material. There is now no difficulty experienced by jobbers in getting their orders filled promptly at the mills. Prices are firm at last week's quotations.

Chicago Report.

Scrap.—Considerably more business is doing in Old Material, but receipts from the country are large and prices are weak. Dealers furnish the following list of buying prices, Chicago delivery:

	Per net ton.	Per lb
No. 1 Wrought Scrap	$7.00	....
Machinery Cast	7.00	....
Malleable Cast	6.00	....
Stove Plate (free of burnt)	5.00	....
Burnt Iron and Grate Bars	3.50	....
Sheet Iron and Hoops	2.00	....
Plow Steel and Breaking Stock	5.50	....
No. 2, such as Shovels, Hoes, &c	4.00	....
Old Boilers—whole (Iron)	4.00	....
" (Iron)—cut in single Sheets and Rings	6.00	....
Old Gas-Pipe and Boiler Tubes	5.00	....
Cast Borings	3.25	....
Turnings	4.00	....
Horseshoes	7.00	....
Copper Bottoms	....	5 ¢
Copper Clips and Heavy	....	7 ¢
Heavy Brass	....	5½¢
Light Brass	....	3½¢
Pipe Lead	....	2½¢
Tea Lead	....	2 ¢
Zinc	....	2 ¢
Rubber	....	4 ¢

Anthracite.—The volume of business is disappointing. The recurrence of mild weather suddenly changes the tone of dealers and consumers. Labor troubles on the railroads are also being adjusted and there is no apprehension of shortage of cars. Carload lots of 12 net tons or over are quoted as follows:

	Grate.	Egg, Sto. and Ch.
Chicago, Ill	$5.85	$6.10
Milwaukee, Wis	5.85	6.10
Kansas City, Mo	9.05	9.30
Council Bluffs, Iowa	9.05	9.30
Lincoln, Neb	9.20	9.45
Sioux City, Iowa	9.05	9.30
Aberdeen, S. Dak	9.10	9.35
Dubuque, Iowa	7.15	7.40
Madison, Wis	7.35	7.60
St. Paul, Minn	8.35	8.60
Burlington, Iowa	7.35	7.60
Des Moines, Iowa	8.80	9.05
Davenport, Iowa	7.15	7.40
St. Joseph, Mo	9.05	9.30
Leavenworth, Kan	9.05	9.30
Omaha, Neb	9.05	9.30

Colorado Anthracite.

COLORADO FUEL & IRON COMPANY.

Denver	$8.00
Pueblo	8.00
Colorado Springs	8.00
Leadville	8.00
Cheyenne, Wyo	10.00
All points between Denver and Missouri River	8.85

Japanese trade with the United States, according to a late statement issued by the Japanese Customs Bureau, is increasing more rapidly than it is with England, France or Germany.

CONDITION OF THE

Hardware Trade.

Business during the past week has been without material variation in volume except the falling off which is expected at this season and during the last days of the month. The market has been characterized by a somewhat more hopeful tone, and manufacturers and merchants have been making their plans for a more vigorous conduct of their business. While the volume of trade has not increased, inquiries in regard to future shipments and the placing of orders for spring delivery have been more frequent, which was regarded as an indication that things were resuming their normal course. The announcement of the new tariff bill, however, with its large reductions in the duties on the many lines of Hardware and related goods, will, it is appre hended, have the effect of unsettling business and checking the improvement which was beginning to make itself apparent in trade circles.

Advices from Chicago.—Shelf Hardware jobbers report a somewhat better condition of business. Not only are orders a little more numerous, but collections are also improving considerably. Shelf goods are going out in larger volume, as well as seasonable goods. The demand for Snow Shovels and other winter supplies, Skates, Sleds and holiday goods generally has been very fair during the week. There is also increased movement in Sheet Iron and Tinners' Stock. Owing to the sustained winter weather, no material change is reported in the price of Shelf goods. Manufacturers seem to have produced in sufficient quantities only to meet the regular demand, and are, therefore, not pressing sales of accumulated stock, as in some other lines. Heavy Hardware keeps up fairly well, owing to the demand for Iron and Steel coming in from both large and small consumers. There are indications of an improvement in the Carriage trade, and a few orders have already been entered for Carriage material for spring delivery.

Notes on Prices.

Wire Nails.—The market has developed no special features of importance since our last review. The demand is only moderate, but the aggregate is considerable, as the low prices which are ruling induce many dealers to purchase such Nails as they require in the near future. Quotations continue on a basis of $1.15 to $1.20 for round lots at mill, the former figure being usually obtainable on good orders. Carload lots delivered in New York are quoted at $1.35.

Advices from Chicago.—The heavy purchases of Wire Nails continued during the past week, but as navigation on the lakes has now closed, the movement will probably be light from this time. There are, however, inquiries for delivery in January, February and March, but manufacturers hesitate to quote so far ahead. Prices dropped to a little lower level during the active trade of the past week, but with the change to all rail delivery an effort is being made to keep prices at the equivalent of $1.30, Chicago. Small lots are now selling at $1.40 to $1.45 from stock.

Cut Nails.—The condition of the Cut Nail market is unsatisfactory, but prices are not quotably lower than last week. The market is represented by the quotation of 95 cents for carload lots at mill, though this figure is shaded and orders can be placed at 90 cents. Small lots from store in New York are quoted regularly at $1.20.

Advices from Chicago.—A fair trade is in progress in Cut Steel Nails, with continued good shipments to the Southwest. Wheeling Nails are again being quoted in this market quite freely, but thus far little business has resulted, as the local makers appear to have a firm grip on the trade. Prices on factory lots are quoted at $1.15 to $1.20, according to the character of the order, while small lots from stock are selling at $1.25.

Barb Wire—In view of the unsatisfactory condition of the market and the extremely low prices which are ruling, some of the manufacturers are practically withdrawing from the market for the time being, refusing to meet the prevalent figures. The competition, however, continues active and prices are low and weak. We continue to quote $2.15 to $2.20 for car lots of Four-Point Galvanized at mill.

Advices from Chicago.—The demand for Barb Wire is of a light character throughout the Northwest and manufacturers appear to be getting most of their business from the South and Southwest. Competition for this business has been keen, but so far it has not affected the local trade. Carload lots of Galvanized are quoted to purchasers in this vicinity at $2.40, while jobbers quote small lots from stock at the old rate of $2.55. Heavy transactions have taken place in Plain Wire at lower prices than ever before made in this vicinity.

Skate Sharpener.—The Union Skate Sharpener, manufactured by the Union Hardware Company, Torrington, Conn., is listed at $3 per dozen, subject to a discount of 30 per cent. to the retail trade.

Climax Lamp Stove.—The Climax Lamp Stove, which is manufactured by Clarence M. Kemp, 101 North Frederick street, Baltimore, Md., is sold to the trade, without the lamp, at $48 per dozen, net.

Brass Nails. — The Just Enough Brass Nails, manufactured by the Grand Crossing Tack Company, Grand Crossing, Chicago, are sold at 50 cents per carton of 20 papers.

Novelty Scraper.—Smith's Novelty Scraper is manufactured by Fernando B. Smith, Canton, Ohio, and is sold at 75 cents per dozen, or $7.20 per gross, net, f.o.b. Canton.

Universal Brace.—The Universal Brace, manufactured by the National Mfg. Company, Wilkesbarre, Pa., is sold at a discount of 20 per cent. from the following list:

	Sweep		
	6-inch.	7-inch.	8-inch.
Nickel plated, per doz.	$33.00	$36.00	$39.00
Black enameled, nickel plated trimmings, per doz.	30.00	33.00	36.00

Glass.—The dissolution of the Plate Glass Manufacturers' Association, to which reference was made in our last issue, has resulted in an open market, and manufacturers of American Plate Glass are in a position to accept orders at any price they may individually choose. There is a reported decline in prices from factory of 20 per cent. American Window Glass is being sold from factory at 85 and 20 per cent. discount for Single Strength and 85 and 20 and 5 per cent. discount for Double Strength. In face of a declining market something like 200 additional pots are reported as having gone into operation since our last report. French Window Glass is still quoted at 75 and 10 and 5 to 80 and 5 per cent. discount. It is too early to surmise what reduction the proposed tariff would make in the selling price of imported Glass, or to what extent it would affect American Glass manufacturers.

Old Metals.—The market for Old Metals continues tame at a low range of prices. Scrap Iron is, however, selling more freely, chiefly in small lots for immediate use. Prices are firm at about last week's quotations—namely, for New York delivery:

Heavy Copper	℔ lb 6¾¢
Light and Tinned Copper	℔ lb 6¼¢
Heavy Brass	℔ lb 5¼¢
Light Brass	℔ lb 4½¢
Lead	℔ lb 3¢
Tea Lead	℔ lb 2½¢
Zinc	℔ lb 2½¢
No. 1 Pewter	℔ lb 14¢
No. 2 Pewter	℔ lb 6¢
Wrought Scrap Iron ℔ gross ton	$9.00 @ $10.00
Heavy Cast Scrap ℔ gross ton	9.00 @ 10.00
Stove Plate Scrap ℔ gross ton	.... @ 5.60
Burnt Iron (delivered at mill) ℔ gross ton	.... @ 5.00

Old Rags, Paper, &c.—The demand for Paper Stock has improved, sales and inquiries being reported as increasing. Prices rule steady at about the following quotations:

No. 1 White Rags	℔ lb 3¼ @ 3½
No. 2 White Rags	℔ lb 2¼ @ 2⅝¢
Mixed Rags	℔ lb ¾¢
Blues and 3ds	℔ lb 1 @ 1¼¢
Hard Sized White Shavings	℔ lb 2¼ @ 2⅝¢
No. 1 White Book Shavings	℔ lb 2 @ 2⅛¢
No. 2 White Book Shavings	℔ lb 1 @ 1⅛¢
Light Book Shavings	℔ lb ¾¢
No. 1 Mixed Shavings	℔ lb ¾ @ 1 ¢
No. 2 Mixed Shavings	℔ lb ½ @ ¾¢
No. 1 Printed Books	℔ lb 1 @ 1¼¢
Ordinary Mixed Books	℔ lb ½ @ ¾¢
Newspapers	℔ lb 3-5¢

No. 1 Manila Paper	℔	1 @	1⅛¢
No. 2 Manila Paper	℔	⅝ @	¾¢
Bogus Paper	℔		⅝¢
Common Paper	℔	¾ @	1⅛¢
Straw Chips	℔	⅛ @	⅝¢
Binders' Clippings	℔	⅛ @	⅝¢
Jute Butts	℔	1⅞ @	2 ¢
No. 1 Jute Bagging	℔	1 @	1¼¢
Mixed Bagging	℔	¾ @	1 ¢
No. 2 Bagging	℔	½ @	⅝¢
Hemp Twine	℔		2¼¢
Manila Rope	℔		2½¢
Jute Rope	℔	1½ @	1¾¢
Mixed Rope	℔	¾ @	⅞¢

Old Rubber.—The market for Old Rubber is of a very restricted character, prices ruling low. The following quotions represent about the values, New York delivery:

Car Springs, ton lots, ℔ lb.	@	$0.03¼
Rubber Shoes, carloads, delivered at factory, ℔ lb.	@	.03
Rubber shoes, less than carloads, ℔ lb.	@	.03⅛
Large Hose, ℔ ton	@	9.00
White Wringer Rolls, ℔ lb.	@	.04¼
White Syringes, ℔ lb.	@	.05

Trade Notes.

THE VIENNA STAMPING & ENAMEL WORKS, at Porter, Ind., whose proprietors failed during the summer, have been sold to new parties. Arrangements are being made to resume manufacturing operations.

THE ALASKA REFRIGERATOR COMPANY of Muskegon, Mich., started work in their factory on the 23d inst., after an idleness of four months. This is claimed to be the largest plant of its kind in the world, and the resumption of work gives employment to a great many hands.

THE GRAND RAPIDS REFRIGERATOR COMPANY, Grand Rapids, Mich., in a neatly gotten up circular to the trade state that their factory is and has been running full time, ten hours a day, six days a week. The company suggest that the trade send in their orders early so that they can make up the identical sizes desired. Last season, they explain, they were caught with a large stock of the wrong sizes on hand, which they refer to as having been unsatisfactory to themselves and their customers. Reference is also made to the fact that the company were awarded three gold medals and a special diploma at the World's Fair for the excellence of their Refrigerators.

THE IRONDALE ROLLING MILLS, at Anderson, Ind., which burned recently, will probably not be rebuilt there. Indiana papers report that the offer made by Middletown, Ind., in the next county to that in which Anderson is located, has been accepted. The rolling mill company are to take $10,000 in lots, and get in addition to this $40,000. They agree to erect a plant that will employ 400 men. Thirty days will be given in which the money is to be paid over.

THE FACTORY AND STOREHOUSE of the T. New Mfg. Company, Avenue B and Twentieth streets, New York, were completely destroyed by fire on November 27. The firm are manufacturers of tar, felt and asbestos roofing.

Chicago is reported as suffering from a regular fire insurance famine. So many insurance companies have been crippled by large damage claims of late that big business concerns find it impossible to obtain all the insurance they desire to carry.

The Chicago Master Plumbers.

The Chicago Master Plumbers held their regular meeting at their hall, 197 Madison street, Monday evening, November 27. T. B. Bryson & Son and Alexander M. Cameron were inducted into membership in the association. There was considerable discussion on the question of having manufacturers of plumbing goods give a guarantee of one year for the perfect working of their goods when properly installed. The members of the association were unanimously in favor of having this result brought about. A communication was received from the Illinois Humane Society requesting a donation of $5, which was complied with. Secretary Murray was requested to use his best endeavors to secure a photograph (cabinet size) of all the deceased master plumbers of Chicago, whether they were members of the association or not. The photographs, when secured, are to be properly grouped and placed in appropriate frames. Those having photographs of deceased master plumbers are requested to communicate with Secretary A. W. Murray. It was announced that a committee from the Real Estate Board would be present at the next meeting and discuss matters pertaining to the care of plumbing work in vacant buildings. Some of the members were of the opinion that, as the World's Fair was over, the high license demanded of plumbers should be reduced to the former rate. Through the kindness of the various manufacturers and dealers in the different articles required by the plumbing trade, who promptly responded to Secretary A. W. Murray's request by sending him circulars and catalogues, a valuable feature has been added to the library of the association. These circulars and catalogues have been properly numbered and indexed, so as to be of easy access to the members of the association, and are generally used.

THE CHICAGO stove trade now moves up and down with the weather. Every cold snap brings in a flood of orders, but as soon as the winds shift to the south business falls off. Merchants have laid in such slender stocks this year that mail orders are likely to run fully up to the average, unless the weather ceases its vagaries and settles down to a long period of mildness.

The deplorable waste of natural gas continues. A well drilled recently near Greenfield, Ind., was wrecked by the pressure of gas, and by last accounts a flow of gas estimated at 30,000,000 cubic feet a day was rushing out unrestricted, the owners being totally unable to get it under control.

Plenty of capital is said to be ready for carrying out a rapid transit system for New York City as soon as the commissioners come to a decision on the plan to be adopted.

A most curious dinner, so far as regards the place in which it was consumed, was given in Brooklyn last week, when 108 persons, guests of the Brooklyn City Railroad Company, were entertained inside of the big chimney of that company's newly constructed power house. The chimney, which is 300 feet high, is the loftiest in New York State and one of the highest in the world, and forms a very conspicuous feature of the Williamsburgh district of the city of Brooklyn.

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Metal and Miscellaneous Prices.

CHICAGO, NOVEMBER 30, 1893.

Tin—
Straits pigs .....23¢

Imported Tin Plates—
Charcoal Plates.—Bright.

Guaranteed Plates command special prices, according to quality.

		Per box.
Calland and Melyn Grade	IC, 10 x 14	@ $6.75
	IC, 12 x 12	@ 6.75
	IC, 14 x 20	@ 6.75
	IC, 20 x 28	@ 13.50
	IX, 10 x 14	@ 8.75
	IX, 12 x 12	@ 8.75
	IX, 14 x 20	@ 8.75
	IX, 20 x 28	@ 17.50
	DC, 12½ x 17	@ 6.50
	DX, 12½ x 17	@ 8.50
Allaway Grade,	IC, 10 x 14	@ 6.50
"	IC, 12 x 12	@ 6.50
"	IC, 14 x 20	@ 6.50
"	IC, 20 x 28	@ 13.00
"	IX, 14 x 20	@ 8.00
"	IX, 20 x 28	@ 16.00

Coke Plates—Bright.

		Per box.
Steel Coke—	IC, 10x14.14x20.	$5.75 @ $5.85
	IC, 14x20.90 ℔	5.50 @ 5.60
	IC, 14x20, 100 ℔	@ 5.85
	10 x 20	8.75 @ 9.00
	20 x 28	11.50 @ 12.70
	X, 10x14, 14 x 20	@ 7.35
B.V. Grade.	IC,10x14, 14x20.	5.85@ 6.00

Charcoal Plates.—Terne.

Guaranteed Plates command special prices, according to quality.

Hansel and Dean Grades.—	
IC. 14 x 20	@ $5.62½
20 x 28	@ 11.25
IX. 20 x 28	@ 14.25
Worcester Brand and equal.—	
IC, 14 x 20	6.12½@
IC, 20 x 28	12.25 @
IX, 14 x 20	7.62½@
20 x 28	15.25 @

American Tin Plates.
Charcoal Plates.—Bright.

Irondale, A. A.—	IC, 14 x 20	$7.00
" "	IX, 14 x 20	9.00
" "	IXX, 14 x 20	11.00
" "	IC, 20 x 28	14.00
" "	IX, 20 x 28	18.00
" "	IXX, 20 x 28	22 00
Florence.—		
	IC, 10 x 14, 12 x 12, 14 x 20	6.75
	IX, 10 x 14, 12 x 12, 14 x 20	8.50
Palma.—		
	IC, 10 x 14, 12 x 12, 14 x 20	7.25
	IX, 10 x 14, 12 x 12, 14 x 20	9.25

Each extra cross $2.00 and 20 x 28 double these prices.

Brilliant, Tissue Packed,	IC, 14 x 20.	$9.25
Royal ,extra,	IC, 14 x 20	7.25
Merion,	IC, 14 x 20	7.00
Almond,	IC, 14 x 20	6.50
Mint,	IC, 14 x 20	6.25

Coke Plates.—Bright.

Elwood.—	IC, 14 x 20	$6.00
"	IC, 20 x 28	12.50

Roofing Plates.

Arch, IC, 20 x 28	@ $11.75
Crescent, IC, 20 x 28	@ 12.25
Crescent, IX, 20 x 28	@ 15.25
Empire, IC, 20 x 28	@ 12.50
Empire, IX, 20 x 28	@ 15.50
Hickory, IC, 20 x 28	@ 12.75
" IX, 20 x 28	@ 15.75
Alaska (heavily coated), IC, 20x28	@ $14.50
Alaska IX, 20 x 28	@ 17.75
Special, IC, 20 x 28	@ 15.50
" IX, 20 x 28	@ 18.50
Merchant's Roofing (extra coated), IC, 20 x 28	@ $17.75
Merchant's Roofing (extra coated), IX, 20 x 28	@ $21.50
Merchant's Old Method, (extra heavily coated), IC, 20 x 28	@ $19.75
Merchant's Old Method (extra heavily coated), IX, 20 x 28	$23.60
Irondale A : IC, 14 x 20	$6.25
IX, 14 x 20	7.75
IC, 20 x 28	12.50
IX, 20 x 28	15.50
Westmoreland : IC, 14 x 20	$6.25
IC, 20 x 28	12.50
Elwood : IC, 20 x 28	$12.00
Juno : IC, 14 x 20	$5.75
IC, 20 x 28	11.50
Illinois, Old Method : IC, 20 x 28	$17.00
E. L.: IC, 20 x 28	$12.50
Jessie : IC, 20 x 28	$12.00
Scott's Extra Coated, Stamped and Resqured, IC, 14 x 20	$9.50
Scott's Extra Coated, Stamped and Resqured, IX, 14 x 20	11.00
Scott's Extra Coated, Stamped and Resqured, IC, 20 x 28	19.00
Scott's Extra Coated, Stamped and Resqured, IX, 20 x 28	22.00
Neville, Stamped, IC, 14 x 20	6.25
" " IX, 14 x 20	7.50
" " IC, 20 x 28	12.50
" " IX, 20 x 28	15.00
Taylor's Old Style, IC, 14 x 20 (Stamped and Resqured)	$9.50
Taylor's Old Style, IC, 20 x 28 (Stamped and Resqured)	19.00
Taylor's Roofing, IC, 14 x 20 (Stamped and Resqured)	8.25
Taylor's Roofing, IC, 20 x 28 (Stamped and Resqured)	16.50
Columbia, IC, 14 x 20 (Stamped)	7.25
" IC, 20 x 28 (Stamped)	14.50
Maple, IC, 14 x 20 (Stamped)	6.75
" IC, 20 x 28 (Stamped)	13.50
Willow, IC, 14 x 20	6.50
" IC, 20 x 28	13.00
Knoxall, IC, 14 x 20	6.25
" IC, 20 x 28	12.50
Globe, IC, 14 x 20	6.00
" IC, 20 x 28	12.00
Miami, IC, 14 x 20	6.00
" IC, 20 x 28	12.00
" IX, 20 x 28	15.00
" (Redipped), IC, 20 x 28	17.00

Tin Boiler Plates.

	Per box of 100 sheets.	Per box of 112 sheets.
X, 14 x 28	$13.00	$13.00
XX, 14 x 28	14.50	14.50
X, 14 x 31	14.50	15.80
XX, 14 x 31	16.50	17.50

	Per box of 56 sheets.	
X, 14 x 56	29.50	16.50
XX, 14 x 56	32.50	18.20
X, 14 x 60	31.50	17.65
XX, 14 x 60	35.50	20.90

Sheet Iron—
Black.

	Common American	Refined.
Nos. 10 to 16	℔ 2 6-10¢	3 2-10¢
17 to 20	℔ 2 7-10¢	3 3-10¢
21 to 24	℔ 2 8-10¢	3 4-10¢
25 and 26	℔ 2 9-10¢	3 5-10¢
27	℔ 3¢	3 6-10¢

Russia, Planished, &c.

Genuine Russia, all numbers....13¢ net.
Patent Planished....℔ D A, 10½¢; B, 9½¢ dis. 5%
Craig's Polished Sheet Steel.....8½¢

Galvanized.

Juniata or first quality.....dis. 70&5%

Copper—
Ingot.

Lake.....11¾¢ @ 12½¢
Casting Brands.....11¢ @ 11¾¢

Sheet and Bolt.

Discount, 25%.

Copper Bottoms.

Discount, 25%.

Seamless Brass and Copper Tubes.

Base price, 17½¢, Chicago, with extras according to size.

Copper, Bronze and Gilding Tube, 3¢ ℔ D additional.

Brazed Brass Tubing.
(To No. 20 inclusive.)

Add freight from New York to Chicago to these prices, or 50¢ ℔ 100 D.

Above 5-16 inch to 3 inch inclu...35¢
Plain, above 3 inch.....45¢
Plain, 5-16 inch.....45¢
Plain, ¼ inch.....60¢
Plain, 3-16 inch.....$1.00
Plain, ⅛ inch.....$1.50
Fancy Tubing, Brass, to No. 20 incl.....43¢ D
Bronze Tubing, 8¢ ℔ D more than Brass.....

} 40 & 45 %

Roll and Sheet Brass.

Discount, 35 @ 40%.

Slab Spelter—
Western Spelter.....5

Sheet Zinc—
600 D casks.....5 ¢
300 D casks.....5¼¢
Loose sheets.....5½¢

Lead—
Soft Pig Lead.....4¢
Bar.....4½¢
Pipe.....5½¢, dis. 10¢
Block Tin Pipe.....35¢
Sheet.....6¢, dis. 10%

Solder—
½&½.....12¾¢@13¼¢
Extra Wiping.....11½¢

The prices of the many other qualities of Solder in the market indicated by private brands vary according to composition.

Antimony—
Cookson.....12¢@12½¢
Hallett's.....11¼¢@11¾¢

Wrought-Iron Pipe—
List on following page.

1¼ and under, Plain	57½&10%
1¼ and under, Galv.	50½&10%
1½ and over, Plain	67½&10%
1½ and over, Galv.	57½&10%
Boiler Tubes, list Oct. 24, 1892	65@67½%
Casing, list Nov. 16, 1892	62½%
Inserted Joints Casing, list Nov. 16, 1892	47½%
Steel Boiler Tubes	27½%
Cold Drawn Seamless Steel Tubing	50%

Cast-Iron Soil Pipe—
Cast-Iron Soil-Pipe, Tarred ; sizes 2 to 6 inches, inclusive.....dis 70&10%
Other sizes.....dis 60%

Leader Pipes—
Abendroth's Galv. Spiral Riveted.....60%
Austin's Corrugated.....60%
Gordon & Gilbert's Corrugated.....60%
Ritchie's (Galv. Iron only) Cor'd.....60%
Ritchie's Spiral Lock Seam, Galv'd.....55%
Austin's Spiral Ribbed Pipe.....60%
Plain Adjustable Elbows.....60%
James A. Miller Bros. (Galv'd Iron only) Corrugated.....60%

Furnace Fittings—
Discount from Excelsior Steel Furnace Co.'s list.....50%

Steel Roofing—
Perfection.....$3.75 square
Climax.....$3.50 square
The Lloyd Spanish Tiling.....$4.50 square

Metallic Shingles—
Cushman's.....$1.25 square
Merchant & Co.'s Spanish Tiles :
Copper, 14 oz.....$36.00 square
Tin.....$9.75@$14.25 square
Steel, painted.....$9.00 square

Drain Pipe—*Tile.*
Discount from list..... 70%

Paints Oils, &c.—
Deodorized Benzine.....7½@8 ¢
Iron Paint, Bright Red.....℔ D, 2 ¢
" " Brown.....℔ D, 1½¢
" " Purple.....℔ D, 2½¢
" Ground in oil, B. Red ℔ D, 6¼¢
" Ground in oil, Red..℔ D, 6¼¢
" Ground in oil, Brown ℔ D, 6¼¢
" Ground in oil, Purple ℔ D, 6 ¢
Linseed Oil, Boiled, in bbls.....44¢
Linseed Oil, Raw, in bbls.....41¢
Mineral Paints.....2@4¢
Orange Mineral.....10¾¢
Pure White Lead in Oil.....6¾@7¾¢
Dry White Lead in bbls.....6¼@6¾¢
Red Lead, American.....7@7½¢
Red Venetian, English, dry...$1.65@$1.70
Red Venetian in oil; asst'd cans, 8½¢ ; kegs.....7¾¢
Sipe's Japan Oil, in bbls, ℔ gal.....$4
Spirits Turpentine, in bbls., ℔ gal..35½¢
Asphaltum, Trinidad Refined, ℔ ton..$45
Tarred Felt, 1 Ply, ℔ 100 D.....$1.60
Tarred Felt, 2 Ply, ℔ roll 108 sq. feet.....$1.25
Tarred Felt, 3 Ply, ℔ roll of 108 sq. feet.....$1.70
Roofing Pitch, D bbl. of 300 D.....$3.00

NEW YORK, DECEMBER 1, 1893.

The following quotations are for small lots.

Aluminum—
No. 2 Grade Metal, in ton lots..℔ D, $0.75
No 1 (guaranteed to be 98 % pure and over), in ton lots .....℔ D .90
Lots less than 1 ton, 10¢ ℔ D additional.

Antimony—
Cookson .....℔ D, 11¢
Hallett's.....℔ D, 10½¢@10½¢

Brass—
Planished.....net
Roll and Sheet.....35@40%

Brass and Copper Tubes
Brazed Brass Tubing—
List May 20, 1889.

	Per D.	
Plain, to No. 20 inclusive, above 5-16 inch to 3 inch inclusive	$0.35	35@40%
Plain, to No. 20, above 3 inch	45	
Plain, 5-16 inch to No. 20	45	
Plain, ¼ inch	60	
Plain, 3-16 inch	1.00	
Plain, ⅛ inch	1.50	
Fancy Tubing to No. 20, inclu	43	

Copper and Bronze Tubing—
3¢ ℔ D more than brass.

Bronze, Tobin—
Drawn Rods for Bolts, Forgings, &c
Over ¼ to 3½ inches inclusive....17¢ ℔ D
Over 3½ to 5 inches inclusive.....18¢ ℔ D

Piston Rods, Finished True, Smooth and Straight.
Over ¼ to 3½ inches inclusive....18¢ ℔ D
Over 3½ to 5 inches inclusive.....19¢ ℔ D

Clips—
Buffalo Damper: Nos. 1, $1.25; 2, 2.50 per doz.....40&10%

Conductors—
Corrugated. *Round or Square—*
Galvanized.....60%
Galvanized, Locked Joints.....60%
Tin.....60%

Spiral Riveted—
Galvanized.....50%

See also *Elbows and Shoes; Eave-Trough Miters; Strainers, Conductor.*

Conductor Strainers—See *Strainers, Conductor.*

Copper—
Bottoms, Pits and Flats....25@25&5%
Ingot.
Lake.....11¢
Ansonia Grade Arizona.....10½¢
Ansonia Grade Casting.....10¢
Planished.....net
Sheet and Bolt.....25&25&5%

Tubes—See *Seamless Brass Tubes.*

Coppers, Soldering—
See *Irons, Soldering*, in Current Hardware Prices.

Damper Clips Buffalo—
See Clips, Buffalo Damper.

Eave Troughs—
Lap or Slip Joint, Galvanized.....60&10%
Lap or Slip Joint Terne.....60%

Eave-Trough Mitres—
Lap or Slip Joint.....list, net

Elbows—
Plain Adjustable—
Tin.....70%
Galvanized.....70%

Crimped Tubing—
Re-Tinned or Galvanized.....35%

Stove-Pipe—
Buffalo Four-Piece.

4½	5	5½	6	7 inch,
$0.78	.87	.90	.99	1.20 per doz.

..20 %

Elbows and Shoes—
Flat Crimp.
Tin.....35%
Galvanized.....35%

Corrugated.
Flat Crimp.
Galvanized.....60%

Round or Square.
Tin.....60%
Galvanized.....60%

Iron, Sheet—
Black.

	Common American.	R. G. Cleaned American.
Nos. 10 to 16	℔ D, 2¾	3½¢
Nos. 17 to 20	℔ D, 3	3½¢
Nos. 21 to 24	℔ D, 3	3¾¢
Nos. 25 and 26	℔ D, 3½	3¾¢
No. 27	℔ D, 3¼	3¾¢
No. 28	℔ D, 3⅜	3¾¢
American B. B.	℔ D, 4¢@4¼¢	

Russia, Planished, &c.
Genuine Russia, according to assortment.....℔ D, 11¾@12¾¢
Patent Planished....℔ D, A, 10¢; B, 9¢, 5%
Craig Polished Sheet Steel.....℔ D, 8½¢

Galvanized.

	B. B.	
Nos. 10 to 16		70@2½%
Nos. 17 to 22		
Nos. 23 to 24		
Nos. 25 to 26		
No. 27		
No. 28		
Nos. 29 and 30		

Filter Joints—
Lee's.....33⅓

Lead—
American Pig.....4½¢@4¼¢
Bar.....4½¢
Pipe.....6½¢, 20%
Tin Lined Pipe.....15¢, 20%
Block Tin Pipe.....37½¢, 20%
Sheet.....7¢, 20%
Old Lead in exchange, 3½¢ ℔ D.

Metal Expanded—
Manufacturers' list No. 5.

Lathing	10%
Fencing, Painted Sheets	20%
Netting, Painted Sheets	20%
Door Mats, Galvanized	25%
Window Guards, Paneled	15%
Tree Guards, Paneled	15%

Mitres Eave-Trough—See *Eave-Trough Mitres.*

Paints Oils &c.—

Lead, Amn. White, in oil	6¾ @ 7¼
Lead, Red, bbls. and ⅛ bbls.	6½ @ 7
Lead, Red, kegs	6¾ @ 7
Ocher, American	1 @ 1½
Red, Venetian, American	1½ @ 2½

Linseed Oil:
Raw, ₱ gal..... @ .40
Boiled..... @ .43
Spirits Turpentine:
In bbls..... @ .32
Putty:
In barrels and ½ bbls..... .01¾ @ .01¾
In tubs..... .01⅝ @ .01¾
In tin cans..... .01½ @ .02½
In bladders..... .01⅞ @ .02½
Roofing Material, &c.:
Asphaltum, Trinidad Refined, ₱ ton..... $30.00@$35.00
Asphaltum, Rock, ₱ ton..... $14.00
Coal Tar Felt, 1 Ply, ₱ ℔..... 2¢
Coal Tar Felt, 2 Ply, ₱ roll 108 sq. ft. $1.42½
Coal Tar Felt, 3 Ply, ₱ roll 108 sq. ft. $1.85
Roofing Pitch, ₱ bbl..... $2.26

Pipe, Drain 50%

Pipe and Fittings, Cast Iron Soil—

Cast-Iron Soil Pipe, Tarred, sizes 2 to 6 inches, inclusive..... 60@60&10%
Other sizes..... 55@55&10%
Cast-Iron Fittings, Tarred, sizes 2 to 6 inches..... 60@60&10%
Other sizes..... 55@55&10%

Pipe, Spiral—

Galvanized..... 60%
Tin..... 60%

Rock and Slag Wool—

	₱ ℔	₱ cub. foot
Slag Wool, ordinary	1¼	15¢
Slag Wool, extra	4¼	38½¢
Rock Wool, ordinary	2½	27¢
Rock Wool, extra	7¼	43½¢

Rosin—

Cmono n and Good—Strained,
Rosin, C. & D..... ₱ bbl. $1.33@$1.35
Rosin, E. & F..... ₱ bbl. $1.45@$1.57½
Rosin, G. & H..... ₱ bbl. $1.92½@$1.85
Rosin, I. & K..... ₱ bbl. $2.50@$3.00
Rosin, M. & N..... ₱ bbl $3.65@$4.20

Seamless Brass Tubes..ne

Shoes and Elbows—See *Elbows and Shoes.*

Slate Roofing—

According to size, f.o.b. cars, Quarry Station.

Pennsylvania:
Best Rangor, ₱ sqr..... $3.25@$4.50
Pen Argyle, ₱ sqr..... 3.50@ 4.25
Peach Bottom, ₱ sqr..... 5.00@ 6.25
No. 1 Chapman, ₱ sqr..... 4.00@ 4.65
Lehigh Slates, ₱ sqr..... 3.00@ 4.50
Vermont:
Sea Green, ₱ sqr..... 2.70@ 3.20
Purple, ₱ sqr..... 3.50@ 4.50
Unfading Green, ₱ sqr..... 3.50@ 4.00
Red, ₱ sqr..... 9.75@12.00

Solder and Soldering Fluids—

Solder—

½ & ½..... 13½@14½¢
No. 1..... 11¾@12 ¢
Prices of Solder indicated by private brands vary according to composition.

Soldering Fluids—

Concentrated Soldering Flux.
f.o.b. New York.
In barrels, ₱ ℔..... 4¢
Smaller quantities, ₱ ℔..... 5¢

Gedney's Soldering Fluid.
In carboys or barrels, ₱ ℔..... 2¢
$1.50 for carboy or barrel; money refunded when returned.

Perfection Soldering Flux.
No charge for package.
8bls., about 500 ℔, ₱ ℔..... 3½¢
½ bbls., about 300 ℔, ₱ ℔..... 4¢
Kegs, about 110 ℔, ₱ ℔..... 4¢
75¢ extra for keg. } 5%
Kegs, about 55 ℔, ₱ ℔..... 4¢

Yager's Soldering Salts.
½-℔ bottles, each..... 30¢
Large quantities, per ℔..... 40¢

Spelter—

Western Spelter..... 4½¢@4¾¢
Bertha..... 8¾¢@9¢

Spiral Pipe—See *Pipe, Spiral.*

Stove-Pipe Elbows—*See Elbows, Stove Pipe.*

Stove Polish—See *Polish, Stove.*

Stove Trucks—See *Trucks, Stove.*

Strainers Conductor—

Galvanized..... 60%

Tin, Pigs and Bars—

Banca, pigs, ₱ ℔..... 22½¢
Straits, pigs, ₱ ℔..... 21½¢@22¢
Straits in bars, ₱ ℔..... 22½¢@23¢

Tin Plates—

American Terne Plates—

Alaska (re-squared) IC, 14 x 20..... $7.00
Alderly, extra quality, IC, 14 x 20..6.37½
Allegheny, IC, 14 x 20..... 6.12
" IX, 14 x 20..... 6.38
Apollo Roofing, IC, 14 x 20..... 6.25
" " IX, 14 x 20..... 7.25
Bonus, Extra Coated, IC, 14 x 20... 6.75
" " " IX, 14 x 20 ... 8.25
Buckeye, IC, 14 x 20..... 7.00
" IX, 14 x 20..... 8.25
Chicago, IC, 20 x 28..... 11.50
Central, IC, 14 x 20..... 5.37½
Climax, IC, 14 x 20..... 5.70
Columbia, IC, 14 x 20..... 7.00
Crescent, IC, 14 x 20..... 6.00
DeMilt's First New York, IC, 14 x 20. 5.75
" First New Jersey, IC, 14 x 20 5.50
" Mohawk, IC, 14 x 20..... 5.50
Dunlap's Double Dipped, IC, 14 x 20 8.25
" " " IX, 14 x 20 9.50
" Domestic, IC, 20 x 28 ....12.00
" " IX, 20 x 28..... 15.00
Empire, IC, 14 x 20 ..... 6.12½
Extra Central, IC, 14 x 20..... 5.62½
Flag, IC, 14 x 20..... 5.50
Fort Pitt, IC, 20 x 28 ..... 11.00
Globe, IC, 14 x 20..... 5.75
Hamilton's Best Redipped, IC, 14x20 9.25
" " " IX, 14x20 10.75
Hickory (Resquared), IC, 14 x 20..6.37½
Juno, IC, 14 x 20..... 5.75
Kensington, IC, 14 x 20 ..... 6.75
" IX, 14 x 20 ..... 8.00
Knoxall, IC, 14 x 20 ..... 6.00
Laufman's Apollo (Resquared), IC, 14 x 20 ..... 8.12
Laufman's Apollo (Resquared), IX, 14 x 20 ..... 9.37
Leominster, Extra Coated, IC, 14x20 7.75
Lion (Stamped), IC, 14 x 20..... 6.25
Lula, Best Charcoal, IC, 20 x 28 ...12.50
" " IX, 20 x 28....16.00
Manhattan, IC, 14 x 20 ..... 7.00
Maple, IC, 14 x 20 ..... 6.50
Merchant's Old Method (Resquared), IC, 14 x 20 ..... 9.50
Merchant's Roofing (Resquared), IC, 14 x 20..... 8.50
McKinley, IC, 20 x 28..... 12.00
" IX, 20 x 28..... 15.00
Neville, IC, 14 x 20 ..... 6.00
" IX, 14 x 20..... 7.25
N. F. Old Style, IC, 14 x 20..... 7.50
" IX, 14 x 20..... 9.00
Old Colony, IC, 14 x 20..... 8.00
Optimus, Best Redipped, IC, 14 x 20 8.25
" " " IX, 14 x 20 9.50
Osceola, Hand Coated, IC, 14 x 20.. 8.25
" " " IX, 14 x 20.. 9.75
Palacio, IC, 14 x 20..... 5.55
Pennsylvania Old Method (Treble Coated), IC, 14 x 20..... 8.50
Phœnix, IC, 14 x 20..... 5.80
Scott's Extra Coated (Resquared), IC, 14 x 20 ..... 9.25
Scott's Extra Coated (Resquared), IX, 14 x 20..... 10.75
Taylor Old Style (Resquared), IC, 14 x 20..... 9.25
Taylor Roofing, IC, 14 x 20..... 8.00
Thomson's Puritan, IC, 14 x 20.....5.75
Tip Top, IC (Resquared), 14 x 20.... 6.62
" " IX " 14 x 20.... 7.88
U. S. Monongahela, IC, 14 x 20..... 6.50
U. S. Redipped, IC, 14 x 20..... 9.25
Venux, IC, 14 x 20 ..... 5.60
Waldo Redipped, IC, 14 x 20..... 7.25
Westmoreland, IC, 14 x 20 ..... 6.25
Wilkinsburg Redipped, IC, 20 x 28.16.00
" " IX, 20 x 28.19.00
Willow, IC, 14 x 20..... 6.25

American Bright Plates—

Almond, IC, 14 x 20..... $6.25
Brilliant (Tissue Packed), IC, 14x20. 9.00
Climax, IC, 14 x 20 ..... 6.50
" IX, 14 x 20..... 8.00
Florence, IC, 14x20..... 6.75
Hazel, IC, 14x20..... 5.80
Linden, IC, 14x20..... 6.50
Merchant's Dipped, IC, 14x20..... 11.00
Merlon, IC, 14x20.. ..... 6.75
Mint, IC, 14x20..... 6.00
Palma Xtra, IC, 14x20..... 7.25
Phœnix, IC, 14x20..... 6.25
" IX, 14x20..... 7.75
Royal, Extra, IC, 14x20..... 7.00
U. S., IC, 14x20..... 7 25

Imported Terne Plates—

Charcoal.
Dean Grade.—IC, 14 x 20.....@$5.50
20 x 28.....@11.00
IX, 14 x 20.....@ 6.75
20 x 28.....@13.50
Abercarne Grade.—IC, 14 x 20.....@ 5.40
20 x 28.....@10.80
IX, 14 x 20...@ 6.62½
20 x 28.....@13.25

Imported Bright Plates—

Charcoal.
Duty: 2.2¢ ₱ ℔.
Melyn and Cal-
land Grade. IC, 10 x 14.....@$6.50
" " IC, 12 x 12.....@ 6.75
" " IC, 14 x 20.....@ 6.50
" " IC, 20 x 28.....@13.00
" " IX, 10 x 14.....@ 8.50
" " IX, 12 x 12.....@ 8.75
" " IX, 14 x 20.....@ 8.50
" " IX, 20 x 28.....@17.00
" " DC, 12½ x 17.....@ 6.00
" " DX, 12½ x 17.....@ 8.00
Allaway Grade. IC, 10 x 14.....@ 6.00
" " IC, 12 x 12.....@ 6.25
" " IC, 14 x 20.....@ 6.00
" " IC, 20 x 28.....@12.00
" " IX, 10 x 14.....@ 7.50
" " IX, 12 x 12.....@ 7.75
" " IX, 14 x 20.....@ 7.50
" " IX, 20 x 28.....@15.00
" " DC, 12½ x 17.....@ 5.50
" " DX, 12½ x 17.....@ 7.00

Coke.
Steel Coke.—IC, 10x14, 14x20.....@$5.50
10x20.....@ 8.50
20x28.11.50@12.00
IX, 10x14, 14x20.....@ 6.75
B. V. Grade.—IC, 10x14, 14x20....@ 5.55

Imported Boiler Plates.—

IXX, 14x26..(112 sheets)..... ..@$13.35
IXX, 14x28..(112 sheets)..... ..@ 14.50
IXX, 14x31..(112 sheets)..... ..@ 16 00

Tinning—Brass and Copper.....net

Tubing—

Tin..... 55%
Galvanized..... 55%

Brass and Copper.—

Standard List..... 35@40%

Troughs, Eave—See *Eave Troughs*

Trucks Stove—

Improved Lock Frame, per doz....$15.00
Steel Lock Frame, per doz..... 18.00
Daisy Improved Pattern, ₱ doz..... 18.00

Zinc—

600 ℔ casks..... ₱ ℔ 5½¢@5¾¢
Per ℔..... 6¼¢

Price-Lists, Circulars, &c.

BLAIR MFG. COMPANY, Springfield, Mass.: Lawn Mowers, &c. A handsomely printed catalogue illustrates with descriptions and prices the Easy, Archimedean high wheel, Hercules high wheel, Bay State, style B, Lawn Razor, style B, Leader, style B, Archimedean horse-power and the Mohawk, style B, Lawn Mowers; California Lawn Sprinkler, Revolving Turf Edger, Lawn Rakes, Model Lawn and Garden Roller and Lawn Sweepers. The manufacturers remark that for the first time during the 15 years they have been engaged in the manufacture of Lawn Mowers and Lawn specialties they now present under one cover a complete list of the different styles of Lawn Mowers, &c., of their production; and that their line of Mowers includes both front cut roller and rear cut side wheel machines of varying hight of wheels and number of revolving knives. The point is emphasized by the makers that in the manufacture of Mowers they apply the principle of exact duplication of different parts of the finished product, by tools and fixtures specially designed and adapted to the work to be done; and that as a result they are able to produce Mowers of superior mechanical construction at the lowest possible cost. It is further stated that they make but one quality—the best—and that any product of their works is warranted to be the highest grade of its kind; also that no order is too large or too small to receive their careful attention. Their European agents are Markt & Co., New York, London and Hamburg.

SILVER & Co., 20 Warren street, New York, and 304-310 Hewes street, Brooklyn: Household Inventions. Large illustrated circulars show Fruit Strainers, Egg Beaters, Soap Cups, Measuring Glasses, Flour Bin and Sifter, Gas Burner Stoves, Spirit Stoves, Steam Cookers, Cooking Crock, Display Stands, Yankee Roach and Beetle Trap, Coffee and Tea Pots, Novelty Gas Heaters, Royal Roasting and Baking Pans, &c.

GEORGE CHASE, 107th street and First avenue, New York: A reduced price-list, under date December 1, 1893, relates to best White Washita, Washita mounted in polished cases, Green Paper grade, and Arkansas Stone. In addition are Arkansas, Scotch and Hindostan Dental Wheels, Regarding Chase's Green Paper brand of Washita Stone, it is remarked that the Stone is carefully selected as to its cutting qualities, being of a soft, even, fast cutting grain.

FLORENCE DISPLAY FIXTURE COMPANY, Geo. H. Bennett, proprietor, 204 Lake street, Chicago, Ill.: Store Display Fixtures. One catalogue illustrates their regular line of standard fixtures, which are always carried in stock. These include Stands, Cutlery and Plate Glass Brackets, Post Bands for iron columns, over counter fixtures, fixtures in shape of letters, &c. Another catalogue shows new and accurate designs of fixtures, the leaves being secured by silken cords to allow the addition of extra leaves. The manufacturers state that their work is all first class and absolutely original. They are prepared to make designs for any style of window or display. The plates in this catalogue show elaborate and handsome designs of fixtures, many with electric lights in them.

THE COLUMBIAN SILVER FLAT WARE COMPANY, Unionville, Conn.: Solid Columbian Silver Flat Ware. The goods made of this substitute for solid silver include Knives, Forks and Spoons. The ware is described as being nearly as white as sterling silver and it is stated that with as careful use as sterling silver it will outlast any flat ware on the market. It is claimed that the knives are as good cutters as solid steel Knives, and that they never show any rust, and that they can be sharpened at any time. The manufacturers warrant the goods manufactured from the metal 25 years to wear as white as sterling silver, to hold a temper equal to silver, and never to show any signs of rust. Illustrations of the goods are shown in various patterns.

LUDLOW-SAYLOR WIRE COMPANY, St. Louis, Mo.: United States Wire Mats and Matting. The Mats are made in regular, circular and irregular shapes. The Matting is made in 50 and 100 feet rolls, 16 to 48 inches wide, or wider if desired. It is explained that rolls can be cut to any required lengths by cutting one wire in two places; that it rolls up close, is elastic, flexible, cleanly, of heavy wire, and that it is so woven as to form a good scraping surface in any position. The point is made that remnants can be worked into regular sizes of domestic Mats.

GRAND CROSSING TACK COMPANY, Grand Crossing, Chicago: New goods. An illustrated pamphlet is devoted to 5-cent goods put up by this company, including Hammer Carpet Tacks, Claw Handle Carpet Tacks, Bonnie Blue Tacks, Bill Nye Brad Box, Just Enough Brass Nails, Double Enough Cobblers' Nails, Wood Keg Carpet Tacks, Gilt Nails, Centum Carpet Tacks, Austral Steel Tacks and House Tacks.

LABOR EXCHANGE.

Notices under this heading of reasonable length are inserted free of charge. Only those relating to employment are admitted. Write distinctly on one side of paper only, and do not use postal cards.

HELP WANTED.

A SALESMAN to travel for a leading manufacturer of warm air furnaces and hot water boilers; must be capable of directing work and estimating from plans and possess a thorough knowledge of the business; give references, experience and state salary desired. "Satisfaction," office of *The Metal Worker*, 96-102 Reade street, New York City. Dec. 2

SALESMEN visiting hardware, tinners and general stores to carry our goods as a side line. "X. Y. Z.," office of *The Metal Worker*, 96-102 Reade street, New York City. Dec. 2

AGENTS who are acquainted with the wholesale and retail hardware, tinware and stove trade to sell our line either on commission or salary; correspondence solicited. "Percy," office of *The Metal Worker*, 96-102 Reade street, New York City. Dec. 2

A large specialty manufacturing company for the coming year wish to market their goods direct to the retail trade throughout the States; reliable SALESMEN, with a good record, who cover their territory every three months, will find this a good opportunity for obtaining a valuable account on a commission basis. For full particulars, address "Factory," 304 Hewes street, Brooklyn, N. Y. Dec. 2

SALESMAN for New York City and vicinity; must be thoroughly acquainted with the trade; references. Rathbone, Sard & Co., Albany, N. Y. Dec. 2

FOUNDRY FOREMAN who is capable of managing 175 molders and thoroughly familiar with all forms of foundry work; give references and state salary expected. "Mobile," office of *The Metal Worker*, 96-102 Reade street, New York City. Dec. 2

SALESMEN to sell on commission to the hardware, plumbing and rubber trade the best and cheapest line of lawn sprinklers made; see advertisement in this paper. Ette & Henger Mfg. Co., St. Louis, Mo. Nov. 25

A bright, energetic man to take charge of a grinding and polishing plant; one who is sober and industrious; a cutlery man preferred. C. H. Covel, 171-187 Wallabout street, Brooklyn, N. Y. Nov. 25

A man who thoroughly understands the tinners' business; none other need apply; state wages, experience and age. G. T. Rock, Lake Charles, La. Nov. 25

Two first-class STOVE SALESMEN for New York State; give age, experience, references, &c. "M.," office of *The Metal Worker*, 96-102 Reade street, New York. Nov. 25

SALESMAN visiting stove dealers in City, Brooklyn and Jersey City wanted to sell stoves on commission. "D.," 142 Chambers street, New York City. Nov. 25

SALESMAN for New York and vicinity trade; address, stating age, experience and salary wanted, "Q. X.," office of *The Metal Worker*, 96-102 Reade street, New York City. Nov. 25

SITUATIONS WANTED.

As home or traveling SALESMAN in New York State, by a man who has gone out of the stove and furnace business; can furnish abundant evidence of integrity and ability; will contract on commission basis if expenses are paid. "J. B. L.," office of *The Metal Worker*, 96-102 Reade street, New York City. Dec. 2

By a TINSMITH who is a good furnaceman and roofer. S. Teichman, 253 Stanton street, New York City. Dec. 2

By a first-class STOVE MOUNTER and PATTERN FILER. "T. C. X.," office of *The Metal Worker*, 96-102 Reade street, New York City. Dec. 2

By a young man 25 years of age in a hardware store as SALESMAN and TINNER; can do any kind of tin work, roofing and spouting; good references; can speak English and German. "T. P. S.," Box 103, Alexandria, Neb. Dec. 2

By a first-class PLUMBER, in city or country; sober and industrious; can furnish best of references. "R. J.," 349 East Fifty-eighth street, New York City. Dec. 2

A1 TINSMITH would like to correspond with parties wanting a good man. Frank Wilcox, Oxford, N. Y. Dec. 2

Any party wanting the services of an experienced man in steam and hot water or hot air heating can learn of such by addressing the Adams Radiator & Boiler Company, Reading, Pa. Dec. 2

By a first-class PLUMBER, in city or country; also good hot water, steam and gas fitter; sober, steady and reliable; references furnished. "Plumber," 19 Centre street, Yonkers, N. Y. Dec. 2

By a brass foundry FOREMAN, to take charge of a small foundry; a good hustler, who will manage same to advantage and help work himself and study employer's interes'; 25 years' experience; reference. C. E. McKenna, 68 Beech street, Paterson, N. J. Dec. 2

In a store or factory, by a STOVE MOUNTER who has had 15 years' experience in first-class work. P. Lobges, 552 Emmet street, Scranton, Pa. Dec. 2

By an experienced MILL MACHINIST on steam piping, shafting or any kind of mill repairs. J. Roberts, Lymansville, Providence, R. I. Dec. 2

By a young man, as TINSMITH; city or country. Fred. Waxman, 209 East Houston street, New York City. Dec. 2

Young man would like to be employed as a general hand in some good hardware store; good all around tinner; country store preferred; best of references. W. R. Thomas, 305 West Harrison street, Dunville, Ill. Dec. 2

A stove and furnace SALESMAN with an established trade in Ohio and Michigan would like to hear from some good concern for the season of 1894. "Home," office of *The Metal Worker*, 96-102 Reade street, New York City. Dec. 2

A furnace SALESMAN, acquainted with trade in Michigan and Indiana, would like to correspond with reference to business engagement for 1894. "Furnace," Box 1130, office of *The Metal Worker*, 96-102 Reade street, New York City. Dec. 2

By a CORNICE CUTTER of several years' experience, where he could take his 8-foot cornice brake. "Brake," 28 East Third street, Covington, Ky. Nov. 25

By a TINSMITH, for outside and inside work and general jobbing; also an experienced roofer; sixteen years' experience in all branches of the trade; strictly temperate. J. O. Samuck, 183 Delancey street, New York City. Nov. 25

Practical TIN and SHEET IRON WORKER of 20 years' practical experience on stoves, ranges, furnaces and general jobbing; city or country. George Laird, 186 Tenth street, Brooklyn, N. Y. Nov. 25

By a first-class TINSMITH; city or country; ten years' experience. "Tinsmith," 11 West street, New York City. Nov. 25

By a STOVE PATTERN MAKER with 20 years' experience on all kind of stove patterns; the same time a first-class carver and designer; competent to make all this line of work for alteration or for new work; and capable to take charge of the shop or work on the bench. F. C. Carver, 426 Fourth avenue, Lansingburg, N. Y. Nov. 25

An experienced ELECTRO PLATER wishes position. "Oxide," office of *The Metal Worker*, 312 The Cuyahoga, Cleveland, Ohio. Nov. 25

All round IRON MOLDER wishes steady employment in the South; Georgia preferred. "I. W. A.", office of *The Metal Worker*, 312 The Cuyahoga, Cleveland, Ohio. Nov. 25

As SPINNER and IRON WORKER on tin and all kind of stamped ware; 17 years' experience with an iron clad manufacturing company; can do anything in the line of spinning and wiring. Chas. Seider, 263 Floyd street, Brooklyn, N. Y. Nov. 25

SALESMAN of eight years' experience and acquaintance with steam and plumbing supplies trade in Connecticut, New York, Pennsylvania, New Jersey, Delaware and Maryland, desires position after January 1; manufacturer preferred; exceptional reference turnished. P. O. box 744, Philadelphia, Pa. Nov. 25

By a practical PLATER of gold, silver, nickel, brass, copper, oxidizing, &c.; capable of managing polishing and plating departments; good reference; steady and sober. "Plater," rear, 28 Seymour avenue, Cleveland, Ohio. Nov. 25

As BRASS MOLDER; eight years' experience; best of references. "J. J. T.," 79 Woodhull street, Brooklyn, N. Y. Nov. 25

As TRAVELING SALESMAN; a young man having a long experience and thorough acquaintance with the tin plate and metal business; can furnish the best of references. "W. W.," office of *The Metal Worker*, 220 South Fourth street, Philadelphia, Pa. Nov. 25

In a tin and hardware store as TINNER and CLERK; 16 years' experience; can do all kinds of tin and furnace work; competent to make estimates on tin roofing; 33 years of age; would desire to engage with a good live business man for a year or more, willing to work for my employer's interest; can furnish good references as to workmanship, honesty, &c. "Tinner," Box 332, Madison, Ohio. Nov. 25

By a first-class FURNACEMAN. N. F. Parks, 1646 Penn avenue, Denver, Col. Nov. 25

A sober and industrious MECHANIC wishes steady employment; well acquainted with all kinds of pipe work, windmills, hot air engines, all kinds of deep well and surface pumps; also very handy on forge and machinery; references; ten years' experience. "G. F.," 136 Macdougal street, New York City. Nov. 25

TINNER and FURNACEMAN with some hardware house, or would take shop to run; competent to estimate on furnace work, roofing, &c.; best of references as to ability and character; situation at once or for next year. "Tinner," P. O. Box 488, Macedon, N. Y. Nov. 25

By a man experienced in making estimates, plans and specifications for steam and hot water heating apparatus, and in superintending the erection of the same; satisfactory references as to character and ability furnished. "Heating," office of *The Metal Worker*, 96-102 Reade street, New York City. Nov. 25

By a first-class SLATE and TILE ROOFER anywhere in United States. Wm. P. Kennedy, general delivery, Omaha, Neb. Nov. 25

By a competent PLUMBER; member of the United Association Journeymen Plumbers, G. and S. F. and S. F. H. of U. S. and C.; good workman on lead or brass; job preferred in a good steady union shop; would go to any part of United States or Canada, providing mileage could be advanced outside of Massachusetts. "R. C.," Lynn, Mass. Nov. 25

Unmarried hardware and house furnishing CLERK seeks position where experience and integrity will work their reward; territory unrestricted; ready at once. "Nominal," office of *The Metal Worker*, 96-102 Reade street, New York City. Nov. 28

As NICKEL PLATER, by a man who has had 15 years' experience as foreman of polishing and nickel plating departments in some very large manufacturing concerns; well recommended; would prefer to go South. Frank June, W. C. F. U. House, Elmira, N. Y. Nov. 25

By a practical stove foundryman as GENERAL FOREMAN or SUPERINTENDENT; can handle a large plant to good advantage; 15 years' experience as foreman and foundry manager; first-class references furnished; ready to take position at once on account of foundry closing. Geo. Kimmich, Greenfield, Ind. Nov. 25

As BOOKKEEPER or SALESMAN, a young man experienced in plumbing, steam fitting and engineers' supplies; A1 references; immediate engagement. "D.," 14 Spruce street, Toronto, Ont. Nov. 25

By a young man as TRAVELING SALESMAN; ten years' experience in stoves, tinware, crockery and glassware; four years on the road; references from former employers. "W. T. G.," office of *The Metal Worker*, 96-102 Reade street, New York City. Nov. 25

A FOREMAN and SUPERINTENDENT of cornice shop working 50 men desires a change. "Reliable," Box 1118, office of *The Metal Worker*, 96-102 Reade street, New York City. Nov. 18

An ADVERTISING SIGN PAINTER with ten years' experience in retail trade is open for an engagement; would like to hear from parties wishing to work the California trade. H. M. Merrill, Marshall, Mich. Nov. 18

A thoroughly experienced tinware and housefurnishing goods salesman would like position as OFFICE MANAGER or BOOKKEEPER and CORRESPONDENT with large jobbing house or manufacturing concern; can furnish good references; no objection to locality. "J. S.," office of *The Metal Worker*, 96-102 Reade street, New York City. Nov. 18

SUPERINTENDENT of stove, range and furnace foundry desires position for January 1, 1894; has had 13 years' experience, and can furnish first-class references from present and other employers. "Superintendent," office of *The Metal Worker*, 96-102 Reade street, New York City. Nov. 18

With a good, reliable house as TRAVELING SALESMAN for tinners' and plumbers' supplies, hot air furnaces and steam heaters; can furnish the very best references regarding character, ability, &c. "J.," Box 1118, office of *The Metal Worker*, 96-102 Reade street, New York. Nov. 18

As SUPERINTENDENT or FOREMAN of stove works, by a thoroughly competent man, capable of handling a large number of men; 15 years' experience; position just vacated on account of closing of shop. P. O. Box O, Greenfield, Ind. Nov. 18

THE METAL WORKER.

NEW YORK AND CHICAGO.

Saturday, December 9, 1893.

DAVID WILLIAMS, - PUBLISHER

BUSINESS OFFICES:

NEW YORK.....96-102 Reade Street.
PHILADELPHIA.....220 South Fourth Street.
BOSTON .....146 Franklin Street.
PITTSBURGH..... Room 509 Hamilton Building.
CHICAGO.....59 Dearborn Street, cor. Randolph.
CINCINNATI.....Rooms 22-24 Pickering Building.
ST. LOUIS.....Bank of Commerce Building.
CLEVELAND.....312 The Cuyahoga.

BRITISH AGENCY: The Ironmonger, 42 Cannon street, London, England.

The Ad Valorem Tin Plate Duty.

While opinions in the tin plate trade differ widely on the question of the advantage or otherwise of reducing the present import duty on that class of material, the entire trade appear to be unanimous in condemning the unwisdom of the proposed change from a specific to an ad valorem tariff. Investigation among importers, jobbers and consumers has elicited a general chorus of disapproval of the action of the Ways and Means Committee in proposing to return to a practice which was abandoned at the earnest solicitation of the trade in 1875 on account of its complete failure up to that time. The practical objections to an ad valorem duty in the particular case of tin plates, as we pointed out last week, are many and weighty, however just and equitable such an arrangement may be in the abstract. When it is considered that an accurate appraisement of tin plates by inspection is practically impossible, even by those most intimately acquainted with the trade, the temptation to fraud and misrepresentation which a duty based on estimated value presents is only too obvious. Apart from any question of high or low tariff, the Wilson bill, in this particular aspect, urgently requires modification, and it is to be hoped that the remonstrances of those best qualified to offer an opinion will be effectual in causing the tariff on tin plates to be made specific before the bill becomes a law.

Misplaced Blame.

In a neighboring city stands a large steam heated building, the heating apparatus having been placed in it a few years ago by a firm of merited reputation for this class of work, and who, in prosperous times, do a large business. It is stated that when the apparatus was first erected both the contracting firm and the owner of the building were much pleased with the job, as in all respects it worked satisfactorily. The plant is of the two-pipe, gravity return variety, and occupants of the building aver that when completed and for a considerable time after it was put in regular service the circulation was good; that the apparatus worked without noise, and that the numerous offices in the building were uniformly warmed. Now the very reverse prevails throughout the building. The noise of the water hammering in the pipes is especially annoying. People who occupy or visit the building and who are unable to perceive the true cause of the existing imperfections unjustly blame the firm that put in the apparatus; whereas, the secret of all the present trouble lies in the unequal settling of the building, which has materially changed, and in some parts completely reversed the inclination of nearly every run of pipes in the building. These pipes are supported by substantial hangers; but no matter how good they may be, if hangers are themselves not firmly supported, the results described may be expected in many steam heating jobs.

A Precaution.

It is not enough to say that people who are inexpert in heating work should not, as they generally do, too readily challenge either the ability or integrity of contractors when, after a time, heating plants work imperfectly. The example given above is one of many existing in all American cities. Heating contractors cannot guard against the settling of buildings in whose construction they have had no part, and are liable to have their most accurate work thus rendered more or less imperfect; but steamfitters ought to bear constantly in mind the fact that they run this risk, and remember that as it does no harm to give a greater inclination to pipe runs than would be needed could absolute stability in structures be relied upon, and as such inclination costs nothing, the greater they can make it within reasonable limits the less will be the risk that subsequent settling of buildings will so diminish the inclination as to interfere with proper working. By following this rule they may often escape blame, which, though it may be totally unjust, is not on that account to be viewed with indifference as affecting their reputations and business.

Help for the Unemployed.

A good deal of serious thought is being given to the very grave question of how to take care of the unemployed during the coming winter. In every community there are many men who are initiating measures looking toward relief. Naturally the different boards of trade are taking the matter into their hands. While, of course, local circumstances must govern the action of such bodies, it would seem that some interchange of opinions ought to take place between their representatives. A good many very important questions of common interest might be very profitably discussed. Delegates of the boards of trade of the great divisions of the country should assemble at such convenient points as Philadelphia, Chicago, Denver and Nashville, to exchange estimates of the magnitude of the misfortunes which they must soon alleviate, and discuss the best and safest methods of reducing distress among the worthy to a minimum. It needs only the invitation of a few leading chambers of commerce or boards of trade to bring about such gatherings, which might do so much good.

Fire losses of the United States and Canada recorded for the month of November keep up the distressingly large figures which have been shown by each month of this year. According to the New York *Journal of Commerce* they amounted to $11,493,000; bringing the total for the year up to the enormous sum of $144,340,000, which will be equivalent to about $156,000,000 for the year, or $24,000,000 in excess of last year's losses. There were 212 fires in November of a greater destructiveness that $10,000 each, 11 of which were over $100,000 and eight over $200,000. This terrible record of fire waste is unparalleled since the great Chicago conflagration, and is out of all proportion with the country's growth.

There appears to be some disposition on the part of the Franklin fund trustees in Boston, Mass., to modify their original and most laudable decision in regard to the disposition of that fund. Pressure from certain influential quarters is, it is said, being used to induce the trustees to expand their views so as to give the proposed institution more of a general educational character, in the way of a technical or manual training college, instead of a trade school pure and simple. It is to be hoped that the Franklin Fund trustees will adhere to their original decision. A definite training in a certain trade, and not a smattering of a number of trades, is what is most needed by the "young American mechanic," for whose exclusive benefit Benjamin Franklin bequeathed the money now available under the terms of his will.

A circumstance, which is quoted as an illustration of the effects of hard times, is that the sales of postage stamps in New York in November were less by nearly $50,000 than those in November, 1892.

Western Freight Discrimination.

Adverse discrimination by local railroads, says *The Iron Age*, has been a long standing complaint of Northern producers. Some of the Eastern railroad systems have yielded to the pressure steadily applied by their local patrons and have made equable rates on commodities manufactured along those lines, but Western managers have been stubborn, and such concessions as they have made up to this time have only been aggravations. There are signs now, however, of a radical change in this policy. Intimations have been given from influential quarters that on at least important business originating at Chicago the interests of the local producers are to be more carefully regarded than has thus far been the case. Whether the policy thus to be changed will have a wider bearing and will characterize Western roads generally cannot now be foretold, but there is good reason to expect a movement of this kind to be somewhat general within the limits of the great traffic associations having their headquarters at Chicago. A change in this respect may bear heavily on the distant producers who are now favored with disproportionately low freight rates on through shipments, but they will have no real ground of complaint if the change is made, especially if local producers are merely put on a perfect equality with themselves.

The persistent refusal of Western managers to put local producers on an even footing with outside competitors in reaching markets further west or northwest shows how deep seated a certain practice can become in railroad management. The growth of manufactures has been very rapid at Chicago and other Western points within the past five years. Commod ities are now manufactured in abundance which at that time were largely supplied from other sections of the country. Having supplied local requirements, these commodities seek a market for the surplus, which is naturally further west and northwest. They are confronted, however, with the fact that under certain moss-grown arrangements their own local roads prorate with lines from competing producing districts on such terms as to give their competitors a much lower rate than they can secure to the same points. This is particularly true in pig iron, but also applies to bar iron, nails, and in fact to iron and steel commodities generally. To reach Western or Northwestern markets manufacturers at Chicago or other points in that vicinity must pay from 25 to 50 per cent. more freight than their competitors on such business pay for that part of their haul over the same track and, perhaps, in the same train, drawn by the same engine. This policy is a relic of the days when manufactures in Indiana and Illinois were confined to the local demands of the community and those States were almost exclusively consumers of staple goods. Freight rates were then devised to meet the conditions existing in the local jobbing trade and, perhaps, were satisfactory at the time. Now, however, both jobbing and manufacturing interests have outgrown the arrangements then made and have long since been ripe for a change.

The plea for fair treatment made by these interests is one that appeals to everybody's sense of justice. There are territorial advantages which ought to inure to the benefit of those located in that territory. A distant producer must expect to be handicapped to some extent in endeavoring to secure business in competition with them. Perhaps he may have compensating advantages in cheaper materials or labor, so that he can overcome the natural difference in freight and offer his product at an even or lower rate at the very door of the local manufacturers. Surely he ought not to complain if he is obliged to pay the same freight rates as those manufacturers when he goes further on and competes with them in territory beyond.. This is the point for which many Northern manufacturers have been long contending. The day may come when they will expect their local roads to go further and give them special rates so as to exclude outside manufacturers. Their attitude would then be indefensible from a rational standpoint. But their present demand to be placed on merely an even footing with distant competitors is just and reasonable.

Rules and Regulations.

BY FOSSIL.

Statutory laws are supposed to be the product of an aggregation of human wisdom and made for the general good, but in some cases they fail to accomplish their intended purposes, or, worse, become like

> "The gun which, aimed at duck or plover,
> Recoiled and kicked the owner over."

In like manner the rules and regulations of domestic or business life can only be proven good or bad by experiment, and it often happens that a modification or abrogation is necessary. The ability to do this makes modern law—unlike that of the Medes and Persians, "which altered not"—of plastic matter and kaleidoscopic construction, so that it may be molded at will or made to assume varied forms to different eyes.

We have an idea that, allowing the inflexibility of those Medo-Persian laws, Daniel, had he a political pull or a good lawyer, might have been acquitted, or failing that, been cast into a den of muzzled lions. Any modern attorney would have discovered that toothless or dead lions were in keeping with the letter of the law.

Coming back to those rules which may be established by that autocrat, the boss. We must concede their necessity subject to circumstantial changes. "Denis," said the boss mason, "I notice that you are a little slow in getting to work, also that your hod is always empty some minutes before quitting time. Now we will have this rule, to start and stop work promptly on time. Drop everything when you get the signal for closing, but give me full time previous."

Next day the clock struck twelve when Denis was on the ladder with a hod of mortar, and remembering the rule, he then and there dropped it, which caused the boss to remark, "We'll put into the rule, except when you are on a ladder." A rule which won't always work is better than none at all and a lack of system is always injurious and often dishonest. The workman who is dilatory or given to "sogering" is like procrastination, which we read is the "thief of time," and if in addition he wastes or loses material, the boss will be likely to rule him out of the shop.

We can conceive of a system, not universally prevalent, which compels a faithful attendance to business in its hours, care in the use and disposal of tools, so that they may not be lost in the chaos of the shop, or left behind at the end of an outside job, and an avoidance of that forgetfulness which must send the helper back for a missing article, while the jour takes it easy at the expense of the customer. There is sometimes a looseness in keeping the account of stock and time on a job, which may result in a disputed bill, for while the customer "can't see where all that went to," the dealer, lacking a system enforced by strict rules, is in poor condition to explain.

We all admit that a code of laws for shop affairs is desirable, but many employers will not take time to make them and their business is run in an erratic manner. It is not necessary that a shop should look as though a cyclone had struck it. Order in everything should be enforced, and to this end there should be rules and regulations.

A Bunsen Burner.

Every one, says an exchange, should have a Bunsen burner in his kit, as it is such a handy little thing and very simple and easy to make. It is simply a piece of brass or other tube about ½ inch in diameter and 5 inches long and then put in a little bushing in one end so that it will just slip down on a gas burner so as to bring the jet about 1 inch from the bottom of the tube. Drill four ¼-inch holes about half way between the bottom to the position of the jet in the tube; this brings the air holes below the flame.

The principle is that the heated gas rushing up to the flame above causes a draft in the tube and the external air rushes in through the openings below the flame, combines with the gas, becomes heated and aids in combustion the same as in the blow pipe. It is very nice to put a piece of brass tubing outside of the Bunsen burner with holes drilled to correspond with the holes in the burner and then the amount of air can be adjusted by turning the outer piece the same as is done in the old tin pepper boxes with the holes in the cover; in this way the air can be adjusted to the burner, as it is best to have the gas at full head unless a very heavy pressure is used. This outer tube can be very readily applied and will be found very handy in many cases where a stationary flame is wanted.

California's Midwinter Fair, to be opened at San Francisco on January 1, gives promise of being a highly successful venture. Twenty-five nations have appointed commissioners and will be represented by important exhibits, and many of the most striking objects from the Chicago World's Fair are being transferred to Golden Gate Park. So many applications for space have been received that the directors are hard put to it to find accommodation for all who desire to exhibit there.

THE TIN SHOP.

Pattern of Flaring Article—Oblong Bottom and Round Top.

From C. D. W., *Willimantic, Conn.*—Can the pattern of inclosed article be obtained by the method shown in Fig. 321 of "The Metal Worker Pattern Book?"

Answer.—The pattern referred to is for a flaring article the top of which is round and the bottom of which is oblong, with semicircular ends. The round top is less in diameter than the width of the oblong base. The pattern can be obtained as shown, or by triangulation, as desired. In Fig. 1 is shown the side elevation and plan as inclosed by our correspondent, to which has been added the end elevation. S is the center from which the round top is described, while the semicircular ends are struck from R and T as centers. The elevation is placed so as to correspond with the plan, as indicated by the lines A M, G R, F T and E N. The part of oblique cone of which one of the ends of article is composed is indicated in plan by P*a* O*a* N O P T, and in elevation by C D E F. One of the triangular sides is shown in plan by O P Q, and in elevation by F C G. The article can be said to be composed of two ends and two sides.

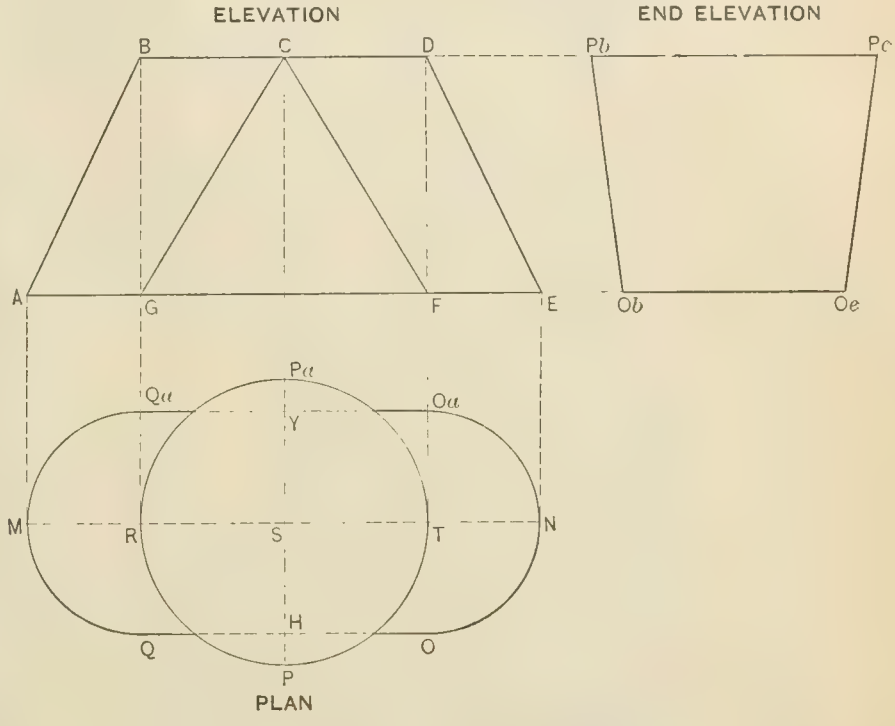


Fig. 1.—Plan, with Side and End Elevations.

To obtain the part of pattern indicated in plan, Fig. 2, by P*e* T*e* N*e* O*e* Divide P*e* T*e* into any convenient number of equal parts, as shown by the small figures. With Z*e* as center, and the points in P*e* T*e* as radii, strike arcs cutting S*e* T*e*, as shown, and from the points thus obtained in S*e* T*e* erect perpendiculars cutting C*d* D*d* of elevation.

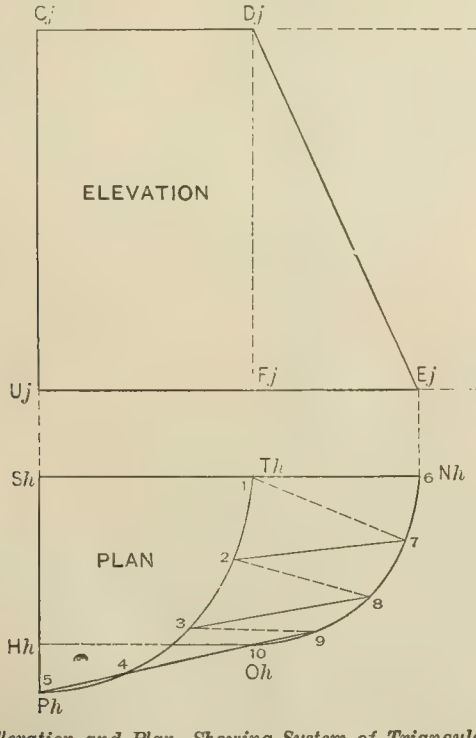


Fig. 3.—Elevation and Plan, Showing System of Triangulation.

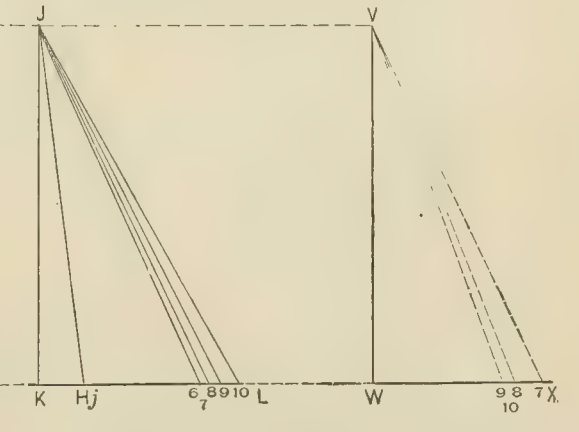


Fig. 4.—Triangles Represented by Solid Lines in Plan.

Fig. 5.—Triangles Represented by Dotted Lines in Plan.

PATTERN OF FLARING ARTICLE THE BOTTOM OF WHICH IS OBLONG AND THE TOP ROUND.

Prolong the side line D*d* E*d* of elevation indefinitely in the direction of J*f*. Through the points C*d* F*d* draw a line, which produce until it meets D*d* E*d* prolonged to the point J*f*. Then J*f* is the apex of an oblique cone in elevation, of which C*d* D*d* E*d* F*d* of elevation is a part. The apex of this cone is shown in plan by Z*e*. From J*f* as center strike ares corresponding to the points in C*d* D*d*, as indicated, and from the same center strike similar arcs from the points in F*d* E*d*, produced by the lines drawn from C*d* D*d* to J*f*.

The arcs from the upper set of points are to receive the stretchout in the fol-

lowing manner: From J*f* draw any line meeting the upper arc, as J*f* P*g*. Set the dividers to the space used in stepping off the plan, and, commencing at P*g*, step from arc to arc, and through the points thus obtained trace a line free-hand, as shown. From each of the points thus obtained draw lines cutting side of article, as shown on plan by H*e* O*e* P*e*. The other part of pattern, as indicated on plan by P*f* O*f* N*e* T*e* Y*f*, can be obtained in a similar manner or by duplication, as indicated by T*g* P*k* Y*k* O*k* N*g*. The pattern when constructed as shown would require two pieces for the article, the seams being P*h* T*h* and O*h* N*h* of plan into any equal number of parts, and connect the points in P*h* T*h* with those in O*h* N*h*, as indicated by the solid lines. These lines represent the bases of triangles, the altitude of which will be equal to the straight hight of the article. For a diagram of the triangles representing

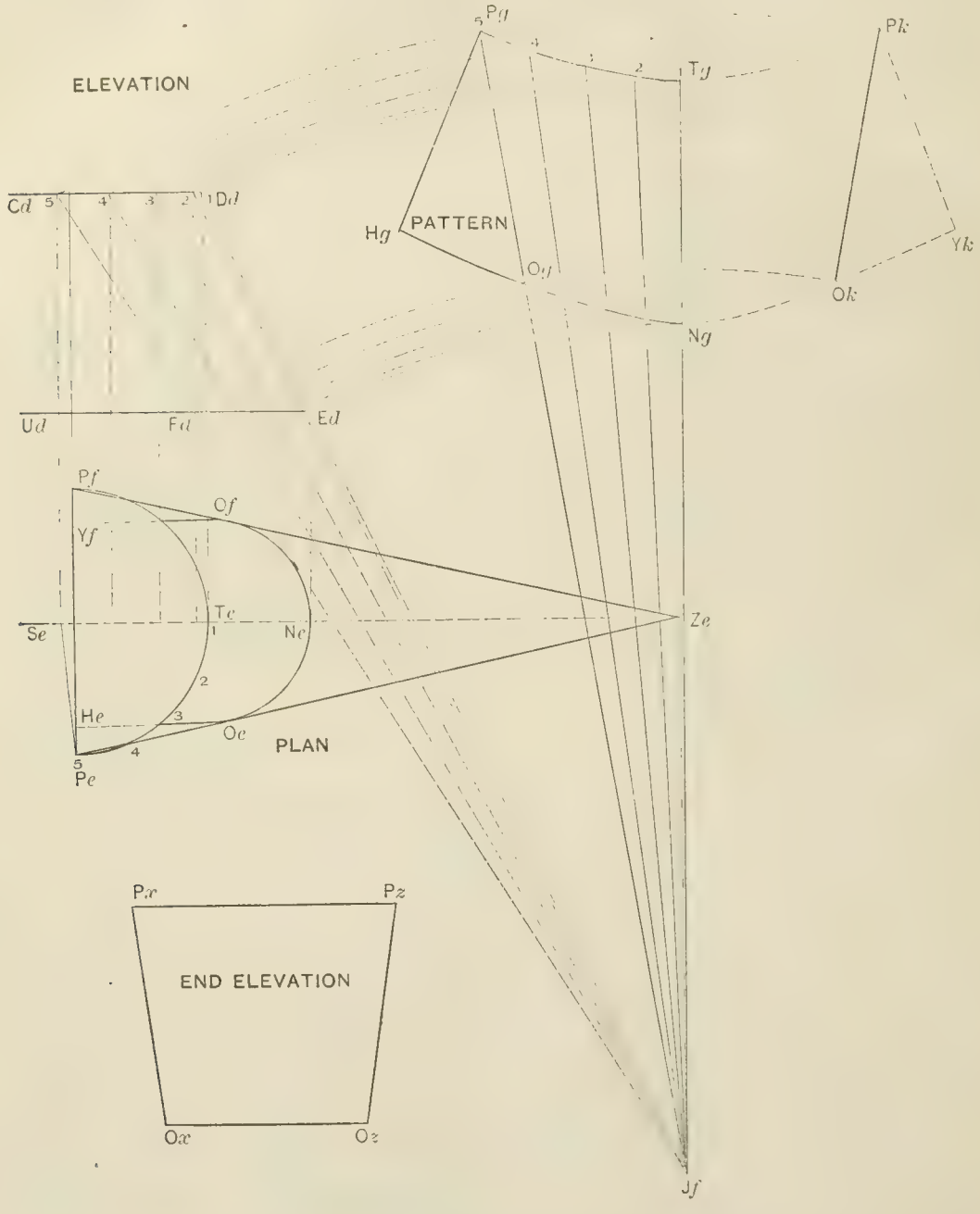


Fig. 2.—Method of Obtaining Pattern from Part of an Oblique Cone.

PATTERN OF FLARING ARTICLE THE BOTTOM OF WHICH IS OBLONG AND THE TOP ROUND.

the lower set of arcs, when a line drawn through these points of intersection will form the lower edge of the patterns, as shown in O*g* N*g*. Then P*g* T*g* N*g* O*g* is the pattern for part of article shown on plan by P*e* T*e* N*e* O*e*. With P*g* as center, and P*z* O*z* of end elevation as radius, describe a small arc in the direction of H*g*, and with O*g* as center, and O*e* H*e* of plan as radius, describe another small arc cutting the one just struck. Draw P*g* H*g* and H*g* O*g*. Then P*g* H*g* O*g* is the pattern for the half of

at the sides, as indicated in Fig. 1 by P H and Y P*a*.

In Figs. 3, 4 and 5 is shown the system by which the pattern can be obtained by triangulation, and for convenience in drawing the triangles the plan and elevation have been enlarged. As shown in Fig. 3, the quarter plan is only necessary for obtaining the necessary triangles for describing the pattern. The hight of the article being known, the elevation is not required, but can be drawn if desired. Divide

the solid lines in plan erect the vertical line K J in Fig. 4, equal to the hight of the article, as indicated by U*j* C*j* of elevation. Then at right angles from K lay off a base line, and on this set off distances, measuring from K, equal to the lengths of the solid lines drawn across the plan in Fig. 3. Thus make K 6 equal to T*h* N*h* and K 7 to 2 7 of plan, and so on. Also set off from K the distance H*h* P*h* of plan, as shown by K H*j*. From the points thus established in K L draw lines to the apex J.

If the triangles shown in Fig. 4 were each cut out separately and placed upright on the corresponding lines in plan their hypotenuses would give the distances between points in the base and top as if measured on the finished article. It must be evident that the same measurements can be obtained from the diagram itself.

The next step will be to construct a diagram of triangles that will give the cross distances between points in the base and top, as indicated by the dotted lines in plan. This diagram is constructed in a similar manner, as shown in Fig. 5. Draw the right angle V W X, making V W equal to the straight hight of the article, and from W set off on W X the length of dotted lines in plan. Thus make W 7 equal to T*h* 7 and W 8 to 2 8, and so on. From the points thus established in the base draw lines to the apex. The hypotenuses of the triangles thus obtained will give the distance from points in the base to points in the top, as indicated by the dotted lines in plan.

In the quarter pattern shown in Fig. 6, P*k* T*k* represents the stretchout of the top P*h* T*h* of plan, Fig. 3, as O*k* N*k* does the stretchout of O*h* N*h* of plan. The distances in pattern represented by solid lines are obtained from radius equal to T*h* 2 of the plan, strike a small arc, as shown, and intersect it with another from point 7 of pattern as center with J 7 in Fig. 4 as radius, thus establishing the point 2 in pattern. Proceed in this manner, using alternately the hypotenuses of the triangles in Fig. 5, the spaces in plan of base O*h* N*h*, the hypotenuses of the triangles in Fig. 4, and the spaces in the plan of top, P*h* T*h*, in the order named, and as above explained. The resulting points, as indicated by the small figures in the

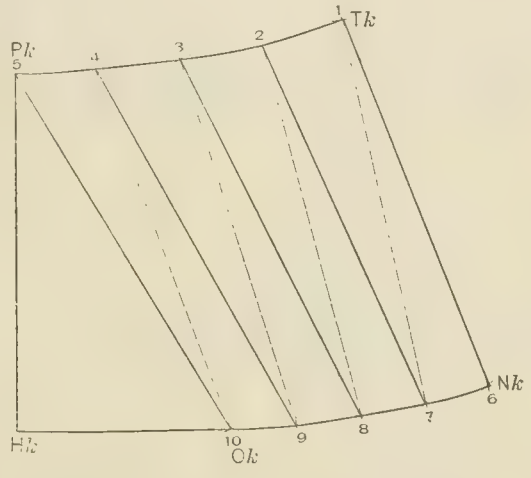


Fig. 6.—Quarter Pattern Obtained by Triangulation.

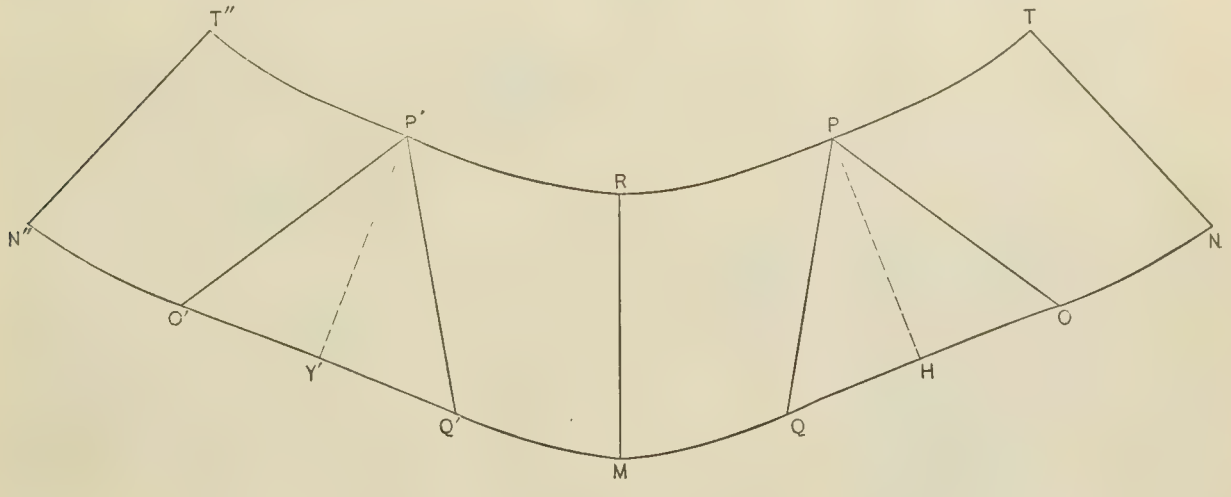


Fig. 7.—Pattern for the Article.

PATTERN OF FLARING ARTICLE THE BOTTOM OF WHICH IS OBLONG AND THE TOP ROUND.

the diagram of triangles in Fig. 4, and the distances represented by dotted lines are obtained from the diagram of triangles in Fig. 5. Then to describe the part of pattern indicated in plan, Fig. 3, by T*h* N*h* O*h* P*h* H*h* proceed as follows: Draw any line, as T*k* N*k* of pattern, in length equal to J 6 of first diagram of triangles, or, which is the same thing, D*j* E*j* of elevation. From N*k* of pattern set off a distance equal to N*h* 7 of plan, striking a short arc, as shown. From T*k* of pattern as center, with radius equal to V 7 of the second set of triangles, intersect this arc with another, thus establishing the point 7 of pattern. From T*k*, with pattern, will be points through which the pattern line will pass. These lines may be traced freehand or by bending a strip of metal to the required shape and scribing round it. For the pattern of triangle P*k* H*k* O*k* of pattern, with O*k* of pattern as center, and O*h* H*h* of plan as radius, strike a small arc in the direction of H*k*. With P*k* of pattern as center, and J H*j* of Fig. 4 as radius, describe another small arc intersecting the one just struck. Draw O*k* H*k*, H*k* P*k*, thus completing the quarter pattern.

In Fig. 7 is shown the pattern for the entire article, corresponding to the plan in Fig. 1. If it was desired to have the article made from two pieces with the joints on the sides, P′ R P H Q M Q′ Y′ would be the pattern. Or, if the article was to be made from two pieces with the joints on the ends, R P T N O H Q M would be the pattern. It will be seen that the pattern for the entire article can be obtained by duplicating P T N O H in the order shown.

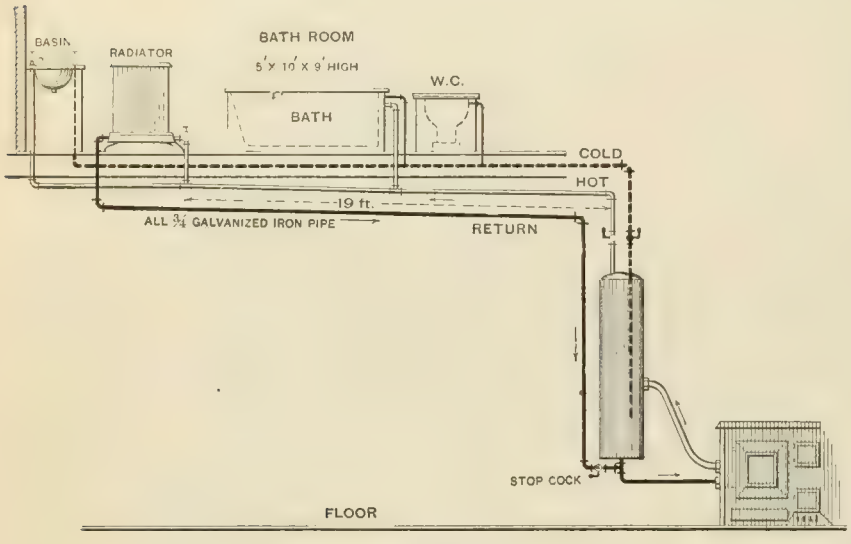
In a small lock factory in Wolverhampton, England, employing but six workpeople all told, their united ages amount to 336 years. They have worked at the factory 52, 48, 41, 36, 33 and 23 years respectively. Such a record, justly observes the *Ironmonger*, is not to be met with every day.

Idle miners in Northern Michigan are said to be becoming desperate. Thousands of them, who have had no work since spring, are, with their families, in a state of destitution ; cold and disease having lately added to their sufferings. Governor Rich has invited the mayors of the principal cities in Michigan to meet in Detroit with the view of taking action to relieve the distress. From indications it is believed that 10,000 to 15,000 will have to be fed and clothed until spring, as none of the mines can start much before that time.

THE LETTER BOX.

Fails to Heat.

From R. J. M., *Dover, N. J.*—I am a young plumber and apply to the Letter Box for assistance to get proper heat from the fixtures shown in the illustration. The bathroom contains 450 cubic feet of space and has a cast iron radiator with 16 feet of surface connected with a 40-gallon kitchen boiler. The pipes are all ¾-inch galvanized iron except that to the lavatory, which is ½ inch. There is a Detroit valve on the radiator and a stop cock on the return at the bottom of the boiler to stop circulation in summer. When the job was put in operation this fall it failed to heat. One evening I attended the fire from 7.30 until 10 o'clock, and while steam came from both of the lavatory faucets the water in the radiator did not become more than tepid and the boiler in the kitchen did not get hot below the hot water connection from the range. It is a 40 gallon boiler setting not more than 2 feet from the range. I was compelled to use square bends, as the customer wanted a neat job and has all of the piping arranged on a board. I am at a loss to know why the job will not work. The pipe from the radiator ought to act as a circulating pipe and keep the radiator hot, and with a good fire there should be no trouble at the boiler. The pressure of the water supply is ample to fill all the fixtures. When I found the radiator would not heat I shut it off and since then the customer reports that he can only get the water in the boiler hot enough to scald when he has a roaring fire. Can the difficulty be in the water back? I have done a number of plumbing jobs, but this is the first that has given me any trouble, and I cannot locate the cause, but hope to get some explanation through *The Metal Worker*.



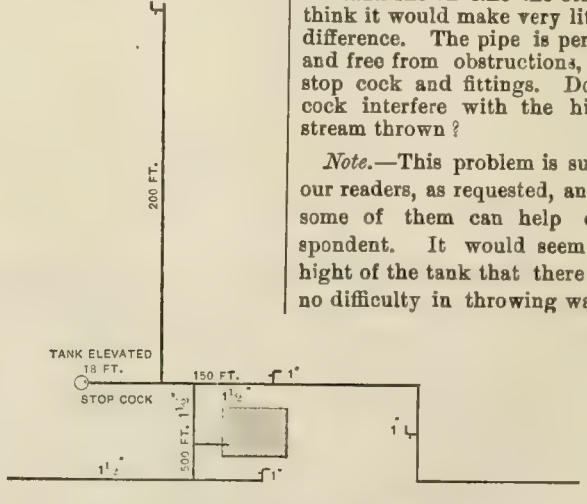
Fails to Heat.

Note.—It is likely that some of our practical readers can help this correspondent. The failure of the radiator to heat is probably because it is air bound, as no mention is made of a pet cock or air valve in the radiator. To put one in the radiator at the top should remove all trouble in heating. If there is a burr on the pipe it would obstruct the flow of water through it to some extent. The failure of the boiler to heat when the radiator is shut off, except when there is an extra fire, points to lack of water back capacity, or some defect either in the water back or the two pipes connecting with it. Provision should be made for an unrestricted flow of water, of the full volume of the pipes, through them and the water back. If the water back used has a partition cast in it this may extend too far, or the mold may have "broken down" and reduced the water way, or if the wires and rods used to support the core have not been removed they might produce the same result. Under such circumstances the circulation would be of such small volume that a large body of water could not be heated quickly, and under heavy firing steam would readily be produced. If the water back is small and so located in a small fire chamber that ashes accumulate quickly and the draft of the smoke and gases is away from it, a large supply of water could not be heated. The arrangement of the pipes, as shown in the illustration, presents no defects in principle, and the trouble must arise from some fault in the piping.

Difference in Stream Thrown.

From E. D. S., *Newman, Cal.*—I would like to hear from *The Metal Worker* and its readers what causes the difference in the hight of the stream of water that is thrown from the two tanks described. The illustration gives a plan of the location of a 5000-gallon tank that is 6 feet high and which rests on a frame work that is 18 feet above the ground, and of a house and stop cocks at different points on the grounds. A 1½-inch pipe leads from the bottom of the tank to the ground, where it divides and runs to the points shown, where 1-inch stop cocks are used. On attaching a ⅝-inch hose, using a nozzle with a $\frac{3}{16}$-inch aperture, there is not enough force to throw water to the top of a carriage. In another place a tank that is 4 feet deep and only 9 feet above the ground, with a 6-inch pipe in the bottom that tapered to 1½-inch pipe near the ground, would throw water three times as high as the stream from this one. Would it increase the hight of the stream thrown to fix the outlet from the tank shown like the other one? I think it would make very little, if any, difference. The pipe is perfectly clear and free from obstructions, except the stop cock and fittings. Does the stop cock interfere with the hight of the stream thrown?

Note.—This problem is submitted to our readers, as requested, and no doubt some of them can help our correspondent. It would seem from the hight of the tank that there should be no difficulty in throwing water to the top of a carriage unless there is a considerable obstruction of some character to create friction and reduce the pressure. To change the pipe from the tank to a tapering pipe would make no radical difference in the stream. Bends in pipes, especially ells, reduce the press-



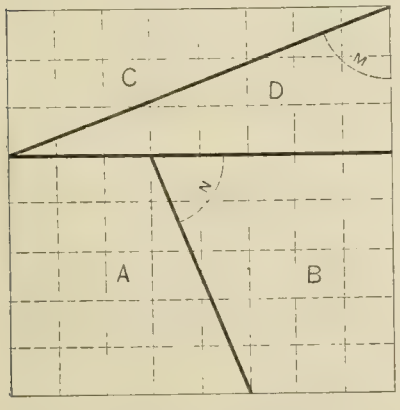
Difference in Stream Thrown.

ure of the water much more than is generally believed. The bends in our correspondent's case may have something to do with his trouble.

An Area Trick.

From H. N , *Philadelphia, Pa.*—In *The Metal Worker* of December 2, "H. D." makes inquiry relative to an area trick in which a square 8 x 8 inches, equaling 64 square inches, is cut up in such a manner as to measure 65 square inches. I inclose square of same size, and how it can be called a "hallucination" is beyond my comprehension, as when the parts are rearranged it consists of 5 x 13 inches, which is equal to 65 square inches.

Answer.—This problem, though an old one, is particularly interesting, because the error is not readily detected. We are indebted to our correspondent



An Area Trick.—Fig. 1.—*Square of* 64 *Square Inches.*

for a card from which we have constructed the accompanying diagrams, Figs. 1 and 2, and will explain wherein the defect lies. Fig. 1 shows the square, 8 inches to a side, drawn to one-quarter scale, while Fig. 2 shows the parts rearranged into a rectangle of the dimensions 5 x 13 inches, or 65 square inches. We have lettered the several parts so that it may be seen in the second diagram how they are placed. Apparently, as we have said, the four parts fit together in the rectangle, making it 5 x 13 inches, and, in reality, that is the outside measurement. But the extra inch is taken out along the middle

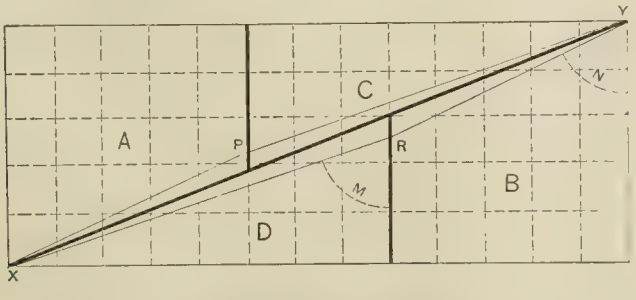


Fig. 2.—*Rectangle* 5 *by* 13 *Inches.*

line X Y, the variation, however, from the true line being so slight that in an ordinary cardboard diagram it would not be noticed. If the line X Y, which represents the edges of the parts A and C and D and B, were straight and continuous there would be no room for the missing inch. As a matter of fact, however, it is not a straight line. In other words, the angles in the corners of B and D, marked respectively M and N, are not equal. This can easily be proved by cutting out such a diagram and placing the part B over the part D, when it will be seen that the corners are not exactly alike, though they are nearly the same, M being slightly larger than N. It will also be seen in a full size diagram that the diagonal lines do not cut the sections evenly. The dotted lines X P Y and X R Y illustrate, in an exaggerated way, the point that we have mentioned, and the space included within X P Y R X would be equal to 1 square inch in a full size diagram accurately drawn.

Since writing the above we have received from a correspondent, G. L. Hayes, Middletown, Conn., a diagram giving a similar solution of the area trick, that is, telling how the square should be cut to produce a rectangle 5 x 13 inches.

Sweated Joint.

From J. R., *Norwich, N. Y.*—Will *The Metal Worker* please explain the process of burning together two lead pipes with a copper bit ?

Answer.—The ends of the two pieces of pipe should be made perfectly square, then cleaned and tinned. If the joint is to be made in an upright position, it is somewhat easier than in a horizontal position. While both ends of the pipe are thoroughly heated they should be accurately joined together so that the bore of the pipe will not be obstructed The hotter the two pipes are previous to their being joined together, the easier it will be to sweat the joint. After the pipes have been joined a hot copper is moved around the pipe at the joint slowly, so as to produce sufficient heat to make the solder on the two ends of the pipe fuse. It is not necessary that the copper should be tinned or that that portion of the copper which is tinned should be used on the joint in doing such work. In some cases, instead of the ends being perfectly square, one end of the pipe is slightly countersunk, and the other end tapered to fit. In a horizontal joint this enables the work to be more readily accomplished.

Electric Tank Filling Alarm.

From H. L. R., *Hannibal, Mo.*—I notice in *The Metal Worker* of November 18 a description of an electric device for telling when the tank is full of water by means of a float valve. I made a similar device, which I used some four years ago, for accomplishing the same end, which I think was simpler than the one your correspondent describes. I made permanent connections, running one wire from the bell in the first story to the sheet lead lining of the tank, to which it was soldered, another wire from the bell to the battery, and a third from the battery to a bent iron rod, which was screwed fast on the outside to the wood of the tank, but not touching the sheet lead, and bent over the top and down in the tank to the level to which we wished the water to come. When the water rose to this point it would complete the circuit and ring the bell.

Note.—Our correspondent sends a sketch with his description, but the simple device is so clearly explained that no illustration it necessary to understand it.

Material for Furnace Smoke Pipe.

From J. B. W., *Lexington, Ky.*—What material is the most durable to use for a furnace smoke pipe that passes over the top of a furnace inside of the casing, galvanized or black iron ?

Answer.—One of the results to be obtained in galvanizing iron is to protect it from rust, and this object is secured providing the iron is not subjected to such a degree of heat as to cause the zinc coating to fall off. In the case of a smoke pipe placed within a furnace casing, it is possible the heat would be so great as to remove the zinc coating from the iron, and if such was the case there would be little difference in durability between galvanized and black iron after the former had been subjected to heat.

A thorough cleansing of the streets of London is carried out every week. Commencing at midnight on Saturday it continues without intermission until 9 o'clock on Sunday morning. All carriageways are swept daily, frequently twice in the day. Courts and alleys are daily cleansed, and washed with jet and hose twice a week. Altogether nearly 4,000,000 gallons of water are used yearly in the work. These operations cost the city the sum of $188,886.

There has recently been introduced in England a new vegetable material called flexus fibra, which is said to possess in a satisfactory degree the properties of the finest leather, being particularly supple and flexible, and taking a polish equally well with the best kinds of calf. It appears to be a flax derived material, suitably prepared and oiled, so that to all appearance it really is leather.

Sudden cold in the West has caused great suffering, owing to the scarcity of coal which exists in nearly every part of the interior. In many parts of Kansas and Oklahoma coal is entirely unobtainable.

PLUMBING and GAS FITTING.

Domestic Electrical Work.—III.*

By W. A. W.

VARIOUS CIRCUITS.

Fig. 6 shows a single bell circuit having three pushes, located at front, side and rear door. Fig. 7 shows a circuit with two bells and three pushes, the bells being arranged as described in Chapter II. Both bells ring from either push. In Fig. 8 is shown an arrangement of bells, which is frequently very convenient, whereby either bell can be used at pleasure. This arrangement is particularly desirable for physicians or any one likely to have night calls. By using a two-point switch, as shown at A, either bell can be thrown into the circuit. Thus, by placing the regular door bell, say, in the hall, another can be placed in the chamber. By throwing the switch over from point 1 to point 2, as shown by the dotted lines, the hall bell will be thrown out and the chamber bell thrown into circuit.

This arrangement will, no doubt, suggest numerous uses to which it can be put to advantage besides that just described. Where it is intended to awaken a sleeping person an automatic drop should be used, which, when the push button is once pressed, automatically closes the circuit and keeps the bell ringing until the person intended to be awakened again hooks up the drop. When using the automatic drop an extra wire must be run so as to make a complete circuit without the push button after the bell has once commenced ringing. When the automatic drop is not used simply omit the wire B and connect C to D, which makes the arrangement first mentioned.

Among the many uses to which electric bells can be put, their use in the dining room should not be overlooked. By its use a servant may be called to the table without attracting the slightest attention, quite a contrast to the old fashioned clanging bell placed directly on the table and which is likely to attract more attention from those gathered about the board than from the servant for whom it was intended. The fittings for dining room bells can be purchased in combination so as to be operated by the foot pressing a push in the floor or by a neat little spring clamp push button provided with ten yards of flexible silk conducting cord, which can be slipped on the edge of the table by the side of the hostess and pressed by the finger without attracting the slightest attention from any one.

Another very useful little instrument is the electric buzzer. In places that are usually very quiet and where the ringing of a bell would be an annoyance, or where a person requires, for instance, to be called away from his desk without attracting any particular notice, the buzzer is invaluable. It operates on the same principle as an electric bell. A popular instrument of this kind can be purchased in the shape of an old fashioned beehive, not larger than 3 x 3 inches and which can be adjusted to emit a musical and pleasing hum instead of the harsh rattling sound which some of the earlier instruments of this kind made. In looking over the catalogue of any first-class dealer in electrical house goods a wide awake person will find a multitude of things which he can bring to the attention of customers with profit to himself and pleasure to the purchaser.

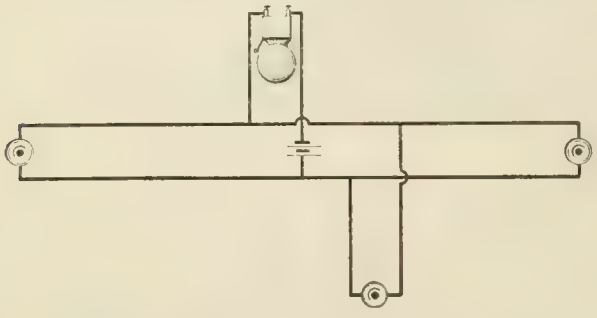


Fig. 6.—Single Bell Circuit with Three Pushes.

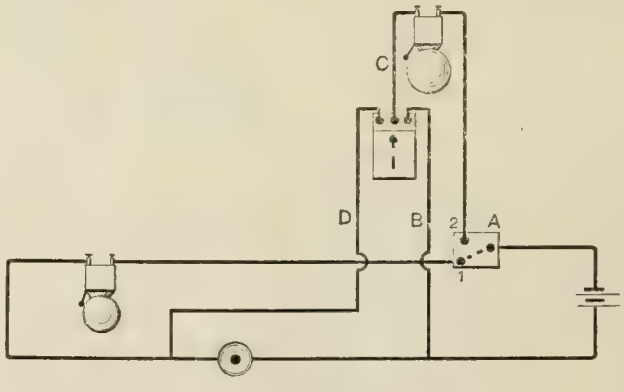


Fig. 8.—Throwing Separate Bells into Circuit by Switch.

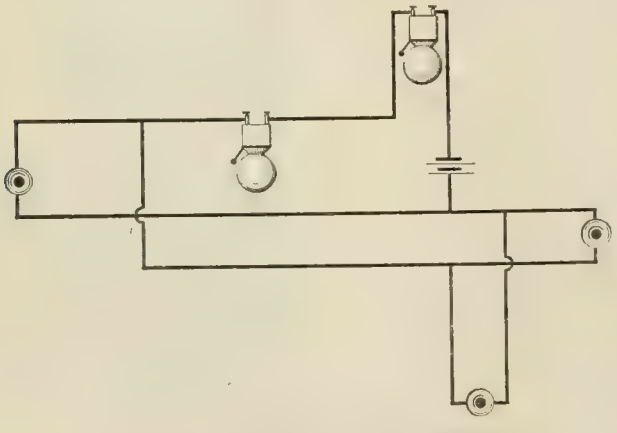


Fig. 7.—Two Bells and Three Pushes.

* Copyrighted, 1893, by David Williams.

Philadelphia Master Plumbers

The Master Plumbers' Association of Philadelphia, Pa., are engaged in the work of securing an agreement from the dealers and manufacturers of plumbers' supplies to conform to the spirit of the Baltimore resolutions. This is the result of the recent visit of President Finnerty of the National Association, who in an address called attention to the great benefit that has been derived from a mutual agreement for the protection of the plumber. He also gave a brief account of the increasing strength of the National Association from the continual addition of new local associations. The proportions that the main body has now assumed give it a prestige that becomes an advantage to all of its branches as an inducement to be set before plumbers who are not already members to take steps to form local bodies.

A MEDAL WAS AWARDED by the World's Fair to the Smith & Anthony Company of Boston, Mass., for their exhibition of Sanitas closets and traps. Their exhibit was inclosed with a handsome railing and was artistically arranged on a carpeted floor. A Sanitas closet was shown in working order that had been divided through the center and a plate of glass cemented to the edges. By this means the operation of the closet was exposed so that it

could be readily understood, and it was examined with interest by many outside of the plumbing profession.

Plumbing Regulations of Clinton, Mass.

Through the favor of C. C. Crowley, Inspector of Plumbing at Clinton, Mass., we are enabled to give a set of regulations governing plumbers and plumbing under the Massachusetts law:

SECTION 1. The Board of Health may license persons to engage in or work at the business of plumbing, provided they have passed satisfactorily the examination required by law.

SEC. 2. No person shall work at or engage in the business of plumbing unless he shall have first obtained a license and shall have registered his name and place of business in the office of the Board of Health. And notice of any change in the place of business of a registered plumber shall be immediately filed with said board, except in the case of a person working for a licensed plumber.

SEC. 3. Every plumber before doing any work in a building, shall, except in the case of repairing of leaks, file at the office of Inspector of Plumbing, upon blanks for that purpose, notice of the work to be performed, with plans and specifications of the same, and no such work will be done in any building without the approval of said inspector.

SEC. 4. Every building used as a dwelling in which plumbing arrangements are to be placed shall be supplied with a water closet for every 15 persons, conveniently located and constantly supplied with water. All water closets constructed after the passage of this by-law must be supplied with water from a special tank or cistern not used for any other purpose, unless permission has first been obtained from the Board of Health to use other fixtures. It shall in all cases be connected with the general or common drain pipe of the house. The use of pan closets is prohibited.

SEC. 5. Every water closet shall be provided with a local vent, the material of which shall be copper, cast iron or galvanized iron. The diameter of this vent shall be for one closet not less than 2 inches, for two and not more than four closets not less than 3 inches, and for any number exceeding four such increased diameter as said board may direct. It shall be carried upward and into a heated flue provided for the purpose, or into the kitchen chimney. In either case it must be entered above the highest opening in the said chimney, or in such other manner as the said board may direct.

SEC. 6. When it is necessary to lay soil pipe under the ground, it shall be of a quality known as "extra heavy" pipe. The pipe passing through the walls of the building, and to a distance outwardly of at least ten (10) feet from inside face of foundation walls, shall also be "extra heavy." All cast iron pipe must be sound and free from holes and other defects, of a uniform thickness and of not less than the weight specified below for the corresponding diameters, and before use shall be thoroughly coated inside and out with coal tar or an equivalent substance.

External Diameter.

ORDINARY PIPE.

2 inches, 3⅓ pounds per foot.
3 inches, 4½ pounds per foot.
4 inches, 6½ pounds per foot.
5 inches, 8 pounds per foot.
9 inches, 10 pounds per foot.

EXTRA HEAVY.

2 inches, 5⅓ pounds per foot.
3 inches, 9½ pounds per foot.
4 inches, 13½ pounds per foot.
5 inches, 17 pounds per foot.
6 inches, 20 pounds per foot.

SEC. 7. Drain and soil pipes through which water and sewerage is used and carried shall be of sound iron when within a building and at least four (4) inches in diameter. They shall be securely ironed to walls or laid in trenches of uniform grade or suspended to floor timbers by strong iron hangers, or as the said board may direct. The space between these hangers shall not exceed ten (10) feet. They shall have a fall toward the drain or sewer, and soil pipes, shall be carried out through the roof, open and undiminished in size, to a distance of not less than two (2) feet above the roof, or more, if the said board shall so direct. Changes in direction shall be made with curved pipes and all connections with pipes shall be made with Y-branches.

SEC. 8. All vertical branch lines of soil pipe twelve (12) feet or more in length must extend up through and two (2) feet above roof, undiminished in size, or more than two feet, if said board shall so direct, or they may be connected with main soil pipe above the highest plumbing fixture. All branch lines of waste pipe fifteen (15) feet or more in length, must be carried up through and two (2) feet above roof or into main soil pipe above highest plumbing fixtures. When two or more fixtures such as sinks, bowls or baths are used in one line, the waste pipe must be of iron, and not less than two inches in diameter. All pipes must be four (4) inches in diameter where they pass through the roof.

SEC. 9. Every drain pipe shall be supplied with a suitable trap placed with a brass clean out at or near the point where it leaves the building. There must also be provided an inlet of at least four (4) inches in diameter for fresh air to enter the drain in house side of trap. This inlet is to be carried to the outer air, opening at such a distance from the nearest window as shall be satisfactory to said board, and where it cannot possibly contaminate the cold air box of a furnace.

SEC. 10. The plumbing of every building shall be separately and independently connected with the public sewer, where such sewer is provided, or with a proper and sufficient drain thereto outside of the building, and if a sewer is not accessible, with a proper cesspool.

SEC. 11. Rain water leaders must never be used as soil waste.

SEC. 12. Sewer soil pipes or waste pipe ventilators shall not be constructed of brick, sheet metal or earthenware, and chimney flues shall not be used as such ventilators.

SEC. 13. Joints shall be run with molten lead, packed with oakum, thoroughly calked and made tight. Connections of lead pipe with iron pipes shall be made with brass ferrules properly soldered and calked to the iron. The lead pipe must be attached to the ferrule by a wiped joint.

SEC. 14. All connection of lead waste and vent pipes shall be made by means of wiped joints. The joints between the soil pipe and water closet shall be made by means of a brass or lead connection.

SEC. 15. Every sink, basin, bathtub, water closet, slop hopper, and of each set of traps or other fixtures, shall be furnished with a separate trap, which shall be placed as near as practicable to the fixture that it serves. Traps shall be protected from syphonage or air pressure by special air pipes of a size not less than the waste pipe, but air pipes for water closet traps shall be of not less than two (2) inch bore. Air pipes shall be run as direct as practicable, and shall not be of less than four (4) inch bore where they pass through the roof. Two or more air pipes may be connected together or with a soil pipe, but in every case of connection with a soil pipe, such connection shall be above the upper plumbing fixtures of the building.

SEC. 16. Waste pipes from refrigerators or other receptacles in which provisions are stored shall not be connected with a drain, soil pipe or other waste pipe unless such waste pipes are provided with traps suitably ventilated, and in every case there shall be an open trap or sink between the trap and refrigerator.

SEC. 17. Pipes and other fixtures shall not be covered or concealed from view until approved by the inspector, who shall examine the same within two working days after notice that they are ready for inspection. When necessarily placed within partition walls, soil and waste pipes must be covered with wood work so fastened with screws as to be readily removed. In no case shall they be absolutely inaccessible.

SEC. 18. No steam exhaust or drip pipe shall connect with the sewer or with any house drain, soil pipe or waste pipe, but blow off pipes may discharge into a suitable tank or condenser, from which a suitable outlet to the house drain may be provided.

SEC. 19. A suitable grease trap must be placed under the sink of every hotel, restaurant, eating house or other public cooking establishment.

SEC. 20. Plumbing must be tested with the water test by the plumber in the presence of an inspector of said board, and all defective joints made tight. Defective pipe discovered must be removed and replaced by sound pipe.

SEC. 21. All material must be of good quality and free from defects. The work must be executed in a thorough and workmanlike manner.

SEC. 22. Every building situated on a public or private way, court or passageway, in which there is a public sewer, and every building connected with any sewer shall have sufficient water closets connected with the sewer and shall not have a cesspool or privy, except where in the opinion of the board it can be allowed to remain temporarily.

SEC. 23. Any license granted under these by-laws may be revoked by the said Board of Health at its pleasure.

SEC. 24. The fee for a license for a master or employing plumber shall be $2; for a journeyman plumber it shall be 50 cents. Said fee to be for the use of the town.

SEC. 25. All by-laws, rules and regulations inconsistent herewith are hereby repealed.

Boston Master Plumbers.

Official information comes to us that the master plumbers of Boston and the master plumbers of Boston and vicinity at a recent meeting appointed their annual Ball Committee. The committee have secured for the evening of January 9, 1894, Odd Fellows' Hall, in which the annual concert, supper and dance will be given. On the morning of the same day the State Convention of Master Plumbers will be held in Boston. It is anticipated that the cities and towns throughout the State will send a large number of delegates, accompanied by their wives and daughters. It is expected that many of the visitors will stop over for the ball in the evening. With this information at hand it is not too early to say "Happy New Year" to the Boston plumbers.

TRAPS AND VENTS.

KENDRICK VALVE & WASHER COMPANY, Syracuse, N. Y., issue an illustrated catalogue and price-list of their specialties that will be appreciated by the plumbing trade. Among the goods noted are plumbers' soil, gas fitters' cement, valve and plunger leathers, cup leathers, packing of various sorts, hose washers, boiler washers, special washers for plumbers' brass work, &c. The illustrations show a variety of cup leathers, valve leathers, valves, &c.; also pipe hooks and straps.

THE WALLACE PLUMBING SUPPLY & SPECIALTY COMPANY, LIMITED, are a new house who have recently opened an office in the Betz Building on Broad street, near Market, Philadelphia, Pa. As their name implies, they will make a specialty of plumbing goods of the higher grade and quality.

PITTSBURGH BRASS COMPANY, 36 Park place, New York, and Pittsburgh, Pa., show in their illustrated catalogue of plumbing goods, recently issued, a very handsome lavatory set known as No. 35. It was on exhibition at the World's Columbian Exposition. The materials used in its construction are brass and onyx, both slabs, the 21 columns in frame supporting slab and the tapering legs being of rich Mexican onyx. The metal parts, of brass, are finished with a heavy gold plate. In this set a square bowl is shown, although oval or round bowls can be furnished if desired. The size of the slabs can also be varied to suit purchasers. This set is of unique design and very attractive appearance.

IT IS REPORTED that the manufacturers of sanitary ware at Trenton, N. J., have recently made a cut of one-third in the price of their goods to dispose of the stock on hand.

CHARLES E. REDELL and B. G. DOSCHER started business recently under the firm name of Redell & Doscher, 114 Church street, Charleston, S. C., where they are engaged in doing tin-

smithing, gas fitting, plumbing, &c. Mr. Doscher is a graduate of the New York Trades School, which he speaks of with much enthusiasm for the assistance it gave him. Mr. Redell is the tinner of the firm and both of the partners were formerly in the same shop.

JAMES WALSH, JR., 444 North Fifth street, Philadelphia, Pa., makes a sweeping challenge for his Challenge double seat steam valve, and directs the attention of the public to it by attaching several brooms to a sign which hangs over the sidewalk with the conditions of the challenge upon it.

G. WAGNER is a salesman from the Phillips Mfg. Company, 219 East 34th street, New York, who never fails to impress the plumber favorably with his line of specialties.

THE COMMITTEE ON ACCOUNTS of the city government of Portland, Maine, has decided that the office of plumbing inspector is unauthorized by the city ordinances and has refused to pay his salary. This official was created by the Board of Health last July, after the passage of the plumbing ordinances, to see that they were properly carried into effect. The Committee on Accounts has discovered that the appropriation for the Board of Health is running short, and in order to continue its effective work during the winter more money will be needed.

A MEXICAN EXCHANGE says the subject of the sanitation of the City of Mexico is just now receiving from the press and public the attention it deserves. Mr. Orozco's plan of keeping the city sewers continually flushed with clean water has now been divulged to several local engineers of prominence, who have unanimously approved it and declared it both simple and practicable.

THE plumbing and tinsmithing establishment of Walter C. Mott, on Caroline street, Saratoga Springs, N. Y., has been sold to Edward Fitzpatrick, James Fitzpatrick and Michael Foy, all experienced men, who will hereafter conduct the business.

CLARK BROTHERS, plumbers, at 217 South Twelfth street, Philadelphia, Pa., have recently added a brass foundry to their manufacturing plant. Two of their specialties are the Acme soil pipe plug and the Acme testing and disinfecting apparatus, which is used for testing the soil pipe of a plumbing system. Mr. J. Clark is secretary of the Master Plumbers' Association of Philadelphia.

W. P. OGILSBY, a plumber, at 1017 Walnut street, Philadelphia, Pa., recently purchased filters from the Wallace Plumbers' Supply & Specialty Company of Philadelphia for use in the residence of Clark Merchant, 1615 Walnut street, in the city named. They will be connected with the service to the building to filter all the water that is used in the house.

IN THE ERECTION of the Betz Building, at Philadelphia, which is an office building of modern character, of extraordinary hight and innumerable stories, no lavatories were placed in the different offices. Now workmen are engaged in cutting holes through the various walls through which to run waste and water pipes, in order that the occupants of the offices may have the convenience of lavatories. The thickness of the walls makes this a tedious job, and in some cases this work required as many days as it was thought hours would suffice to accomplish the same result. Another trouble experienced is in not being able to avoid the iron girders that are placed in the building, and frequently, after considerable time has been spent in cutting holes, it was found necessary to begin operations in another place.

CARVER & HOWELL are a new firm of brass finishers at 1819 North Fifth street, Philadelphia, Pa., who will make a specialty of plumbers' brass work. They are issuing a four-page circular of plumbers' goods.

AN EXCHANGE gives the following account of how a plumber got ahead of the corporations: There was a novel case before an alderman a few days ago in which the Steam Heat Company were applicants for a search warrant to examine a plumber whom they suspected of heating his residence with steam manufactured by the Steam Company, and for which they received no pay. It appears that the property occupied by the plumber was formerly a residence of a steam heat company official, and he had to make connections with the steam mains, but on leaving had caused the pipes to be plugged. The plumber removed the plugs After a little detective work on the part of the steam company a search warrant and a policeman caused an admission from the plumber that he had tapped their main. It is understood that the affair is to be settled.

W. H. MORTON, plumber, has opened a store at 259 Main street, Malden, Mass.

THE Clark & Wellington Plumbing and Tinning Company of Bridgeport, Conn., have filled a certificate of organization at the office of the Secretary of State.

JOHN N. MCLEAN is visiting the plumbers of Chicago in the interest of the E. P. Gleason Mfg. Company of New York. This trip is devoted entirely to pneumatic and hydraulic pumps, though gas and electric lighting fixtures may be incidentally talked over.

Gas Engines in Germany.

The last report of Frank H. Mason, Consul-General at Frankfort, Germany, contains the following:

Prominent among the economies which have been introduced during recent years in Germany is the use of gas motors in place of steam engines in all the smaller forms of manufacture where the motive force required does not exceed 75 to 100 horse-power. At the Frankfort electrical exposition of 1891 most of the dynamos were driven by gas and caloric engines, and the display of these motors at that time was almost as varied and interesting to the general public as that of the electrical apparatus to which they were technically subsidiary.

The statement is made that there were in operation in Germany at the time referred to, about 18,000 gas motors, aggregating a motive force of about 60,000 horse-power, since which time, by the gradual cheapening of gas as a result of careful saving of tar, ammonia, and other subsidiary products of coal distillation, the number has increased to about 25,000. The improvement in economy in these motors has been remarkable. The Lenoir machine, the best known as late as 1861, used 1235 cubic feet of gas per horse-power per hour, while at the present time small motors only consume 28 feet, and large motors as little as 23.75 feet. As the cost of gas ranges from 95 cents to $1.36 per 1000 feet, and 21.2 feet of gas will run a 16 candle incandescent lamp an hour, which figure is reduced to 17.6 feet in large plants, it readily appears that this motive power is very economical for the smaller forms of manufacture, and especially for electric lighting by isolated plants.

HEATING & PLUMBING.

NEW WORK AND CONTRACTS.

WESLEY LYNES, one of the progressive plumbers of Johnstown, N. Y., has recently installed the steam heating plants in two large school buildings at that place, using four No. 6 Gorton boilers.

J. J. WADE & SON, 298 Dearborn street, Chicago, have the contracts for plumbing in the addition to the Equitable Building, Washington and Dearborn streets, and the Champlain Building, State and Madison streets. The Wade accessible sewer flushing system is to be used in the above work, and the Wade patent wash basins and syphon jet closets in the Equitable Building.

THE WALCOTT-HURLBUT COMPANY, 175 and 177 Lake street, Chicago, furnish all brass goods used in connection with the plumbing in the huge Stock Exchange building now going up at La Salle and Washington streets. T. W. Potts & Co., 40 State street, do the plumbing.

THE ILLINOIS HEATING COMPANY, 88 Lake street, Chicago, are to supply hot water heating plants in the residences of M. W. Church, Edgewater; C. W. Leeming, Grand Boulevard, and Joseph Kipley, Forest avenue,

AMONG THE CONTRACTS for steam heating recently taken by the Theo. Jacobs Company, 72 and 74 Market street, Chicago, can be mentioned the following: Apartment building of F. Halla, Aldine place; apartment building of Herman Splinter, Belleplaine avenue; residence of A. M. Krause, 989 Milwaukee avenue; Nell apartment building, Orchard street and Garfield avenue; residence of J. J. Wade, Michigan avenue; Champlain Building, State and Madison streets. The American radiators are to be used in filling all the above contracts.

TWO No. 4 GORTON BOILERS were used by the Smith-Courtney Company of Richmond, Va., for heating a large church in that city.

THE BRIDGEPORT STEAM HEATING COMPANY will place the steam heating apparatus in the new Gem Theater, on Broad street, at Bridgeport, Conn.

J. C. F. TRACHSELL, 246 Arch street, Philadelphia, Pa., reports that his trade in hot water heating has increased in that section, and that the Gurney boilers have been used exclusively by him.

D. F. MORGAN has opened an office at 30 North Fifth street, Philadelphia, Pa., where he makes a specialty of steam fitting supplies of every character.

CLARKSON, SCOTT & Co., 118 Custom House place, Philadelphia, Pa., are about completing their large contract of heating the Holmesburg Prison. Among other contracts which recently occupied their time was the residence of Daniel Ball, at Sixteenth and Locust streets, where they used an O K steam boiler and Bundy radiators. The gymnasium building at Swathmore College is another contract which they are completing. They have recently heated the stable of W. Harrison, at Glenside, Pa., using the Mercer steam boiler.

GEORGE W. TILLOTSON has recently installed a new hot air apparatus in the Methodist Church, at Northfield, Vt.

T. J. HARNETT, Newtonville, Mass., has the contract for the plumbing at the Adams School.

SOME of the Massachusetts agents for the Richmond boilers who report a good trade this fall are George R. Estabrook, Springfield; W. S. Backus' Sons, Pittsfield, and E. E. Parker, Woburn.

THE CITY COUNCIL of Joliet, Ill., recently passed a resolution that the city clerk be directed to advertise for competitive drawings or plans for an eight-room school building to be erected in Ridgewood, at the corner of Jackson and Walnut streets. Said plans to provide for the heating of the school by steam.

DESERNO & Co., plumbers, of East Main street, Chillicothe, Ohio, have secured the plumbing and gas fitting contract at the handsome residence now being erected by George H. Smith on East Fourth street.

THE COMMISSIONERS OF PUBLIC GROUNDS AND BUILDINGS will receive separate proposals and plans for the erection of a steam heating plant for the new library and executive building, House of Representatives, and additions to the Senate Chamber, at Harrisburg, Pa., until December 12. Plans and specifications can be seen at the office of the architect, room 10, Capitol building.

JAMES T. KAY, Meriden, Conn., is doing the plumbing and heating on Henry Stockder's new house, also the plumbing on a new house which O. D. Penfield is building on Cook avenue.

RUFE BROS., manufacturers of heating apparatus at Doylestown, Pa., have recently made an addition to their plant of a new horizontal engine and boiler. The firm have the contract for introducing steam heat in St. Vincent's Orphan Asylum, in Philadelphia, and will also put steam apparatus into William E. Geil's new double house in Doylestown.

H. H. FERRIS of Ballston Spa, N. Y., has contracted with J. B. Thomas & Son, Milton avenue, for an Auburn steam heating apparatus for his house on Pleasant street.

THE BERLIN MILLS COMPANY, at Berlin Falls, N. H., have been awarded the contract for heating the new Green Block, in that town, and will use a Richmond hot water boiler.

ARTHUR CARON, Salmon Falls, N. H., has purchased a hot water heating apparatus of the Swamscot Machine Company, South Newmarket, N. H.

BABB, WITHAM & KELLY, Bangor, Maine, have recently finished plumbing the Everett T. Rich house, in Hammond street, built by Charles Smith. It has had a Volunteer heater put in which works to perfection. The plumbing work in this house is first class throughout. They are also doing a large amount of work on the Vanceboro Mfg. Company mills, at Guilford. The mill has been thoroughly piped for heating and 1000 feet of 3-inch water pipe laid for fire purposes, and the mill is being covered with corrugated iron. The work is in charge of Mr. Kelly of the firm.

A PREVIOUS NOTICE inferred that the residence of Clarence V. Gardner, at Cynwyd, Pa., had been heated by a boiler set by J. F. Boyer of Norristown, Pa. To correct this error we are informed that a No. 465 hot air furnace, made by the Fuller & Warren Company, Troy, N. Y., was used by Mr. Boyer to warm the building, and one of their double steel oven ranges is a feature in the culinary department.

IT IS REPORTED that Secretary Carlisle has ordered L. L. Benson, a sanitary expert of Kalamazoo, Mich., to make an examination of the United States Treasury Department building, at Washington, and submit a proposition for such improvements in the ventilation, sewerage and plumbing systems of the building as he may deem necessary.

THE BOARD OF ALDERMEN of Cambridge, Mass., have appropriated $2000 for the purpose of putting the Agassiz school house in a sanitary condition.

THE BOARD OF TRUSTEES of the Whittier State School, at Whittier, Cal., will receive bids up to December 23 for the plumbing, gas fitting and heating, tin and galvanized iron work and metallic roofing for a main cottage building for girls and an industrial building to be erected at that place.

THE DIRECTORS of the State Normal School for Deaf Mutes at Morganton, N. C., will award contracts for heating and lighting their building on December 13.

ALBERT LONGLEY will spent $35,000 in adding two stories to his warehouse building on South Water street, Chicago. The extension will require galvanized iron work plumbing and gas fitting.

THE NEW BUILDING of Snellenberg, the clothier, at Twelfth and Market streets, Philadelphia, Pa, is being heated by the Penn Engineering Company, who are using Keystone radiators.

CALLAHAN & CLAYTON, 44 North Second street, Philadelphia, Pa., are engaged in erecting a ventilating plant and dust carriers for a saw mill for W. H. Jackson & Son, at Salisbury, Md. They made all the sheet iron work used in the ventilating and heating plant at the Hotel Metropole for Thompson & Brothers, steam fitters, on Bread street. They are also engaged in doing the sheet iron work for the heating and ventilating plant which is being installed by Henry B. Pancoast & Co. at the Pennsylvania Hospital, on Locust street, Philadelphia.

THE NEW YORK STEAM FITTING COMPANY, 211 Centre street, New York, have been awarded the contract for heating the Trinity School, at Ninety-first street and Columbus avenue, New York. The building is five stories high and 75 x 100 feet, and will be heated on the plenum system, using Sturtevant fans and a horizontal tubular boiler made by the Vogt Bros. Mfg. Company.

S. J. MARSHALL, Kearney, N. J., has recently completed a contract which, he claims, is one of the best pieces of work in his section. It is a three-story building erected by William Evans. The first floor is arranged as a saloon and dwelling, the second for a ballroom and the third is a lodgeroom. It is heated by an Exeter steam boiler with Exeter radiators, which give excellent results in every particular. On the first floor there is a toilet room, with two of Mott's closets with tanks and two urinals with Mott's self-acting syphon tank, and in his dwelling is a bathroom with bathtub, lavatory and water closet, and a copper boiler and enameled sink in the kitchen. The second and third floors are provided, in addition to a toilet room similar to that on the first for men, with a toilet room for ladies, which has two water closets with automatic seat and tanks and a lavatory. The work throughout is said to have been done in the best possible manner and the best materials have been used. This is the third large and first-class job done by Mr. Marshall recently.

THE ILLINOIS HEATING COMPANY, 88 Lake street, Chicago, are to furnish steam heating plants in the two houses built for the Hecox estate, Austin, Ill.

THE THEO. JACOBS COMPANY, 72 and 74 Market street, Chicago, have the contract for hot water heating in the residence of H. R. Wilson, 4515 Grand Boulevard.

Impenetrability of Armor Plate.

BY A. TINKER.

With the exception of three years spent in helping to adjust a slight difference of opinion I have spent 37 years in the plate business. It has been mostly tin plate and with a light coating, nevertheless I have had some experience in testing armor plates, which occurred during the three years mentioned. Having been on duty as wagon guard, when the Quartermaster issued orders to lighten baggage it fell to my lot to be one of those detailed to go through the wagon train and select those articles which could best be dispensed with. The old quartermaster was a fire eater and had no sympathy for anybody who had a longing for a tree to get behind when the compliments became substantial and were passed with fervency and celerity. He made remarks which should be repeated to ladies in the original Greek when we found stowed away in one of the wagons a dozen vests of very heavy cloth, lined with a thick, soft flannel and having between these materials thin plates of steel which had been guaranteed of the genuine Damascus brand. These vests were originally bought for $15, but their true value could have been thoroughly tested by wearing one in a campaign against Jersey mosquitoes of the World's Fair size. When the old man's back was turned I hung one on a post to test it, with the idea that I would rather come home and brag than have my folks put flowers on the soldiers' monument for a hero who was lost in the wilderness. Well, I blazed away at it, and as I was examining it the old man came back to see what the row was, and on seeing the hole ordered me to put up two, which I did, with the same result, and the old man said put up another, and still I bored a hole, and again with the fourth I proved the quality of my old smooth bore. The old man was now laughing as loud as he had cussed before, and said, "Its a cold day for the cowards, put on more clothes," but the fifth vest stopped the ball, though it made a big dent. He told us to throw all of them we found away, observing that a fighting man's skin made a better soul case than such blasted contrivances, for it didn't inconvenience his movements, while if he wore enough of them "coward's delight" to protect him they would kill him anyhow.

An interesting World's Fair souvenir has been sent us by the Abbott Machine Company of Chicago. It is a *fac simile* of the great check issued Chicago Day at the World's Fair for $1,565,310.76, upon the original of which an Abbott punch was used.

STEAM AND HOT WATER.

American Comments on English Practice.—I.

By Percival H. Seward.

When we go into a residence fitted with a modern system of steam or hot water heating, including magazine boiler, damper regulator, automatic water feeder, and the several other appliances invented and introduced with the idea of making everything practically self acting, it is difficult to appreciate reasons for the adoption of any system requiring endless attention and preventing an appearance that is anything but ornamental. It is a fact, however, that in England at present buildings are being fitted up with appliances for heating which must be not only troublesome and expensive, but are anything but attractive in appearance.

This condition of affairs is not brought about so much by the objection to cost as by the feeling that "what was good enough for the old folks is good enough for me." Of course I am writing on the supposition that the reader is an American and therefore used to all the common, every day little conveniences which are still considered luxuries in Europe.

I had the pleasure of making a trip to England during the past summer, and being engaged in the business of steam and hot water heating, my principal line of observation and comparison was in that field. While there I saw a large number of different kinds of heating apparatus, and I think they fairly represented what may be considered the latest practice.

In all probability the majority of the readers of this article are familiar with steam and hot water heating, particularly that which is generally used for smaller buildings, residences, greenhouses, &c.

ENGLISH BOILERS.

The most popular class of boiler at present in use in England still appears to me to be what we call saddle boilers. These saddle boilers are now made, however, in such a way that they are vastly more economical than the older style and take up much smaller space in proportion to their heating capacity. The common saddle boiler has been substantially improved by the introduction of hoods, baffle plates, internal flues, check tubes, &c. The fact that vertical surface is much better for house heating boilers than horizontal seems to have been kept in view also. Formerly the circular top of a saddle boiler was counted upon as valuable surface when used as one side of the return flue, but I found that this has been done away with. The boiler is now made square on top and then used as a support for the brick work, as people in England are just as liable to clean the heating surfaces of a boiler once in five years as we are in America.

Portable boilers do not seem to be making much headway over there, although there are several styles lately brought out which seem to be bringing this class into favor. The only portable or independent boilers which I saw, larger than the little stove heaters in use here, were imported from this country. The English people seem to have a quiet hankering after brick set boilers, caused principally, I think, by their intense fear of fire, although, as we here know perfectly well, there is not so much danger from one of our modern portable boilers as from a brick set one.

PIPING.

Their principal medium for the distribution of heat seems to be cast iron pipe. Indeed, the extent to which this is used is wonderful to an American. Not only is it used for mains—I might say exclusively—but for radiation as well. I asked a prominent heating engineer over there why this was the case, and he said that the only way he could account for it was that the men are much more used to erecting it, and then their wrought iron pipes are not made so extensively and with such a degree of perfection as with us, while accurate, sightly fittings for the pipe, after it is made, are almost impossible to get. It seems to me to be with them a general rule to use cast iron pipe for all sizes over 2 inches in diameter, while it is often used for smaller work. I ventured the mild remark that there must be lots of trouble and annoyance in making the joints—my idea was derived from seeing plumbers making soil pipe connections—but was quite surprised when informed that it was much easier and more satisfactory than making them with wrought iron fittings. Wrought iron fittings caught my ear but after I had seen a few of these curiosities I did not dispute his opinion. I was the means of securing an order to one of our prominent steam fitting manufacturers for cast iron fittings, and I think if it was not for the annoyance caused by changing threads to agree with the English standard that we would be supplying the entire trade over there with pipe fittings.

I must say that heating contractors are severely handicapped in Europe, for the reason that they have to put up with such miserable appliances. To us they seem trivial, but impress one with their importance when you come to put up a job without them. Manufacturers here are daily receiving orders for such little things as radiator valves, air valves, fittings of all kinds, &c., and I predict that, unless the British manufacturer wakes up to the importance of listening to the cry of heating contractors for these goods, America will be supplying them exclusively, not to speak of radiators &c.

RADIATORS.

Radiators are another thing in which they have great room for improvement. For the same reason that they use cast iron pipes in preference to wrought iron, they use pipes and pipe coils in place of radiators. Just fancy going into an elegant parlor and seeing two 4-inch cast iron pipes running around the baseboard for radiation; yet this is what I saw as an example of heating put in a residence about three years ago. Of course, this is not general, but it would not be seen at all if they had radiators to use which for compactness and beauty of design could approach those we see and use in the United States. Cast iron pipes are all right for greenhouse work, but the line ought to be drawn at that when using them for radiation.

CELLAR PIPING.

I went into the cellar of one house and the system—allow me the expression—of mains put me very forcibly in mind of soil pipes as we are used to seeing them in cellars here. Most of the joints in this case were made with yarn and lead, or of the rust pattern, although one of the firms I visited showed me a rubber ring for use in making these joints, and which had been recently patented by them. To return to our cellar, however, the arms, as we would call them, were all of cast iron pipe, while the risers—this was one of their latest productions — and radiator stubs were wrought iron pipe. The valves were of American make, but the radiators were of their regular extended surface pattern, something similar in appearance to the Whittier radiators. Some of the radiators made in England now are cast in one solid piece and not in sections as we are used to seeing them. The ratings are by feet of 2-inch pipe which they are equal to, and not by their square feet of surface.

(To be concluded.)

Heard at the Air Valve.

An itenerant sends the following collected from here and there in the steam and hot water heating trades:

"I draw the line on chimneys less than 18 feet high for greenhouse heating," said the engineer of a house manufacturing hot water heating apparatus. He could just as well have gone on and said how many square inches of flue area were required by a square foot of grate surface, but he didn't, and I cannot supply the omission.

That the chimney plays an important part in all heating plants is shown by another authority who had to apply a remedy where a steam boiler didn't heat. He found a large old-fashioned open fire place in the room above the boiler, and the pipe from the boiler was run up the chimney just above the top of the fire place and stopped. The fire place rendered the chimney useless so far as the boiler was concerned, though it was large enough to use a ladder in cleaning it. As a fire was sometimes burned on the hearth, the fire place could not be closed, so the pipe was continued to the top of the chimney full size.

"Everything heats up fine but two radiators on one run of pipe," was the report on a steam job which had been carefully laid out by an expert. "I am sorry that the boiler is too small for the work, for I shall lose money in changing it," was the unpleasant reflection on the fault of the planning. On going to find the cause of the trouble, as proof that the boiler lacked power it was stated that "the pipe is hot right

up to the radiator, connection but there it stops." It was a return pipe system and a trap was made in both the flow and return by using too long a piece of pipe in connecting them after the pipe hangers and supports had been adjusted. The flow pipe was filled with hot water just far enough to keep steam out of the radiator. "Oh! that little rise and dip could'nt make the trouble, but I'll change it just to show you." It worked.

An enterprising hot water man thought a hot radiator out in front of his store one winter day would be a good advertisement. So he put it out and connected it with his boiler. The boiler had easily taken care of 800 feet of radiation distributed in his store and residence in zero weather. He found it necessary to shut off all of his indoors radiators to keep his outside radiator from freezing.

A well known authority observed: "I shall hardly be able to harmonize some of the statements I have made in the past with some of the practice employed in a new system of steam heating that I am perfecting, but the world moves and corpses do not. I have learned to understand the principles better and apply them more effectively." Here is an example of progress worthy of being followed, and is evidence that this man does not belong to that class of "people who never change their minds."

HEATING NOTES.

AN ADVERTISING CARD issued by H. R. Ives & Co., Montreal, Canada, bears a *fac simile* in gilt of a card announcing the medal awarded at the World's Columbian Exposition, Chicago, for the Buffalo heaters made by the firm. In an accompanying circular letter they speak of the excellent results that this boiler has given, and they also announce their facilities for furnishing architectural iron work of every description.

THE HERENDEEN MFG. COMPANY, Geneva, N. Y., have established a branch office at Philadelphia, at 1020 Betz Building, with E. K. Barr as manager. Mr. Barr will look after the interests of the concern in Philadelphia and vicinity and push the sale of the Furman hot water and steam boilers.

THE WORK on the Buffalo, N. Y., Steam Heating & Ventilating Company's works, which are in process of erection at Homewood Park, is progressing rapidly. The plant is claimed to be the most complete of its kind in the country. A large force of men is engaged in putting down the cement floors throughout the works. The glazing is nearly finished, and the works will soon be in condition for occupancy. However, the company do not expect to occupy their new quarters until after the first of the year.

THE HEATING AND PLUMBING TRADES will be glad to know that N. E. Frost, connected with the firm of Smith & Winchester, Boston, Mass., is the proud father of an 8 pound boy, who arrived Saturday, November 25. Mr. Frost has not yet decided upon the youth's future occupation, but says that judging from his voice at present, he is likely to become a tenor singer in grand opera.

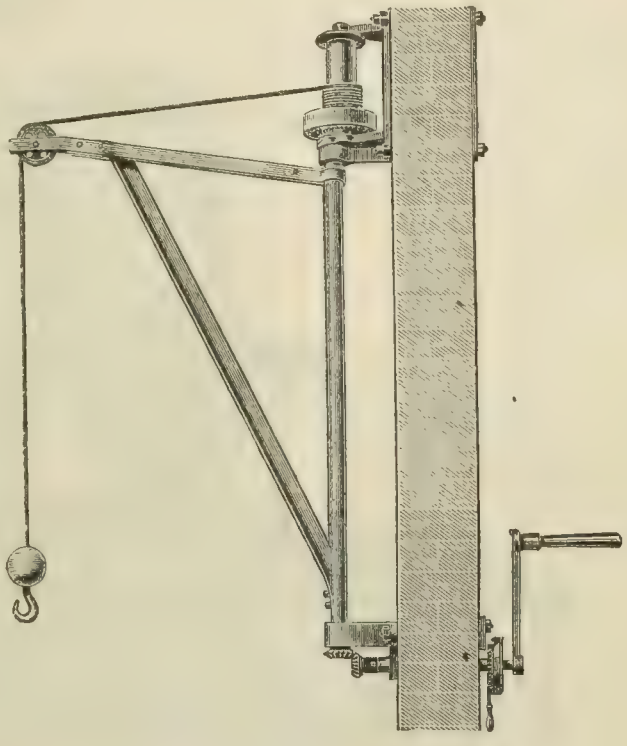
J. S. MAKIN, 54 North Second street, Philadelphia, reports a lively trade on the Monitor steel tubular heater, which is also made as a combination heater for heating with hot water, and is provided with the Monitor draft regulator. The double Monitor is a combination of two of the ordinary Monitors, and designed for heavy duty or for use in the early fall or late spring, when a fire need only be used in one of the furnaces. Quite a number of this style of the Monitor have been used and universal satisfaction given.

SAMUEL BURNS has recently returned from a trip through New England in the interest of the hot water goods made by Thomas Weathered's Sons, 244 Canal street, New York.

A Convenient Jib Crane.

The form of jib crane brought out by the Messrs. Abbott of Newark-on-Trent, illustrated in some of our English exchanges, is described as follows:

The brackets which support and hold the crane externally are bolted right through the wall. Below the foot plate



A Convenient Jib Crane.

are seen externally two bevel wheels. The spindle of the pinion passes through the wall and is worked by a handle inside the building. The other wheel is attached to a shaft working within the tubular upright of the crane, as in a sleeve. The head of this shaft is connected with a vertical winding drum within the grasp of the top external bracket, which, like the foot plate, is secured by bolts passed clean through the wall. Everything thus communicating between outside and inside is a close fit, admitting neither damp nor draft. The jib is supported by a stay. The whole gear is made of steel, and of varying capacities to lift from 2½ to 5 hundredweight, 10 hundredweight and 1 ton.

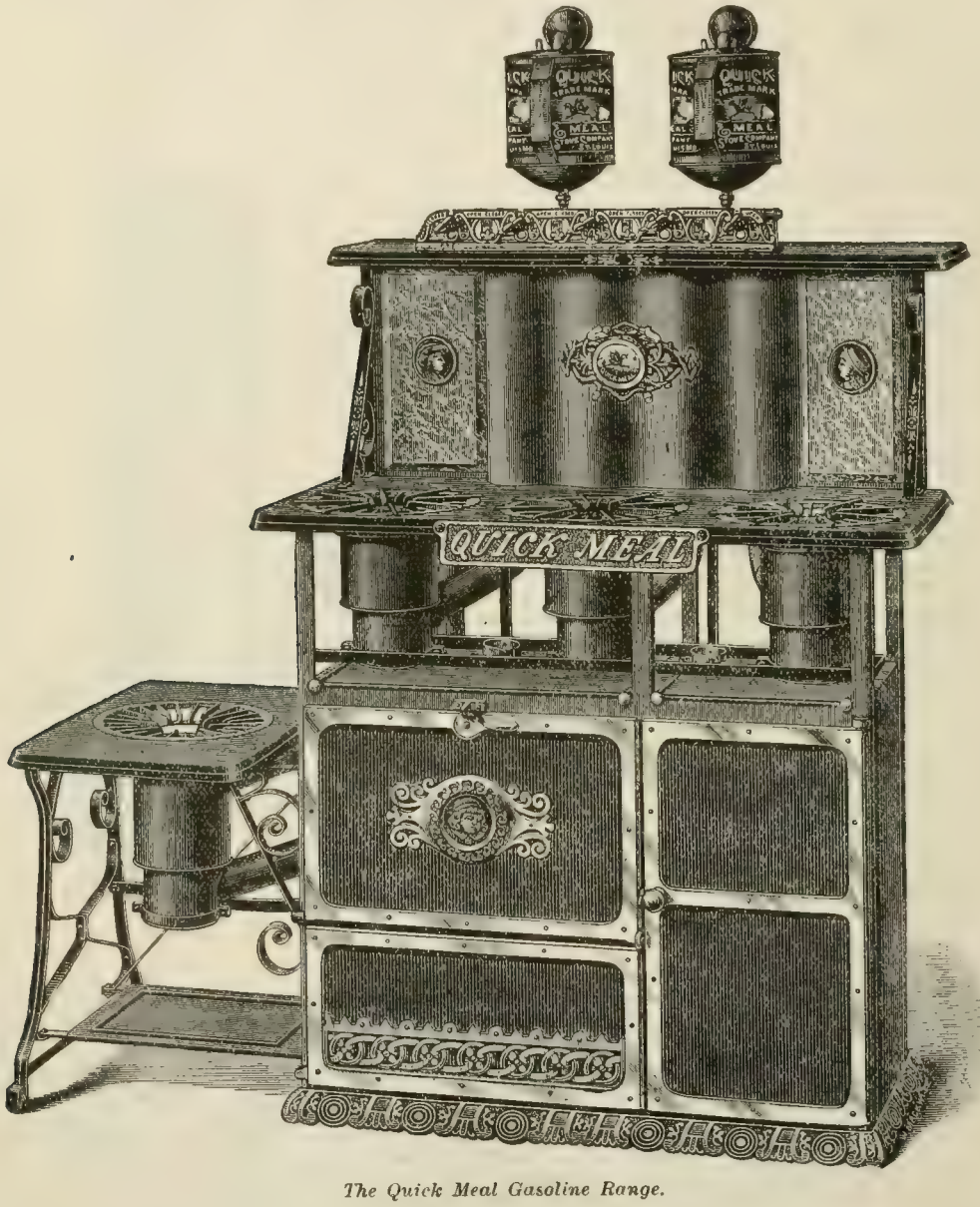
The handle attached to the pinion spindle being inside the wall, a valuable economy of internal floor space in the hoisting operation is afforded. For ordinary winding with the handle alone, a simple and convenient brake connected with the external drum gear can be put in action by a pull-rope hanging down inside the wall within reach of the hoister. But when the goods require careful treatment, and speed of lift is not required, a worm wheel can be added, which works with the utmost smoothness and which will hold the weight of goods in operation at any point where they are simply allowed to rest. This worm wheel works itself out of gear whenever the pressure of the load is relieved by its deposit at its destination. The spindle of the worm wheel, like all other portions of the crane, is fixed without any open orifice in the wall. The two smaller sizes of the crane are worked by the simple bevel gearing at quick speed. Nothing can be safer than the worm gearing, for the load will not run down if ever the handle slips off; but it is too slow in speed for ordinary use, unless where the goods being transferred are liable to damage from shocks.

M. Ghest of Paris has discovered, says an exchange, a new preservative composition which adheres strongly to iron, steel, zinc, copper and other sheathing metals. The preserving coating does not easily crack or peel, and sheets covered with it may be bent or twisted without showing any signs of cracking. The most violent vibration of bridges and viaducts is without effect. It is applied cold like ordinary paint. When dry, a layer of colored paint may be added if desired. Metal sheets, when covered with it, are proof against the strongest acids, such as hydrobromic, hydrochloric, hydriodic, sulphuric, sulphurous, nitric, &c. A brass sheet remained three months in a sewer, and afterward 36 hours in a bath of nitric acid, without the slightest change. Wood impregnated with this product is said to be insensible to change from water, damp or insects. Samples of oak, pine and porous woods have been buried for 16 months in damp earth without showing any signs of decay.

A great pool, or combination, of the lake shipping interests which center at Buffalo and West Superior has, it is rumored, been arranged.

The Quick Meal Gasoline Range.

The Quick Meal Stove Company, of St. Louis, Mo., have just brought out for the season of 1894 a gasoline range known as the Quick Meal, and presented in general view in the accompanying illustration. The range is of a size and completeness which renders it suitable for use in hotels or restaurants, and in other places where it is necessary to prepare food for a number of people. Under the top plate are three burners, while under the step is an extra strong one, with still another under the bake oven. The manufacturers claim that the strength of these latter burners is nearly equal to two of the top burners. Under the latter are removable pans for the purpose of catching the drippings from the vessels above. At the right of the bake oven is a warming closet fitted with three shelves. The range is strongly constructed throughout, the base being of cast iron, which the makers claim greatly adds to the beauty of the stove, while making it more substantial than would otherwise be the case. They also refer to the cast iron base as an innovation in this class of ranges. Another advantage of this form of construction is that the dust is kept from getting under the stove. The ornamentation includes nickel and tile, which form a strong contrast with the jet black japan finish. The back of the high shelf has marbleized panels, in which are inserted tiles in polished brass frames. The company state that the gasoline supply of the stove is ample, there being two independent tanks, one supplying three burners and the other the remaining two. The stove is referred to by the manufacturers as "the most beautiful, most substantial and of the greatest capacity on the market."



The Quick Meal Gasoline Range.

Aluminum is gradually coming to the front in many departments of industry. From a foreign exchange we learn that an officers' field canteen has been introduced into the German army, of which the whole of the cooking utensils, plates, cups, &c., are made of aluminum. The weight of the entire outfit for six persons is little more than 9 pounds.

The Colorado Irrigating Company have projected a canal to irrigate 1,200,000 acres of land in the Salton Desert of that State. The water will be conveyed from the Colorado River, the total length of the canal being about 400 miles, and the estimated cost $5,000,000. Should water be placed on the tract in question, its value would be raised to about $20,000,000.

Constituents of Smoke.

The Russian *savant* Lakline is of opinion, observes a foreign exchange, that the reason why efforts toward smoke prevention have hitherto met with so little success, must be sought in the fact that, while the gaseous constituents of smoke have often been determined, the solid and liquid portions remain but little known. When coal or lignite is burned the lighter products of combustion, especially those containing carbon and hydrogen, are given off under the influence of a high temperature. Their disengagement is complete or partial; and the same is the case with the solid carbides containing less carbon and hydrogen, and which, when the combustion is not complete, are drawn along with the lighter products. In such a case the carbonic acid, nitrogen and the remainder of the oxygen combine not only with the carbonic oxide, but also with the mass of unburnt substances and compounds of carbon, hydrogen, oxygen and nitrogen, carbon being set free in the state of soot, and all those substances forming the dark yellowish-gray substance called smoke.

In Great Britain the work of connecting all the lightships and lighthouses with the telegraph system of the country has been begun.

How I Learned the Trade.

BY A. N. D.

Serving the first six weeks of my apprenticeship, beginning the last week in August, had given me a pretty clear idea that a general notion prevailed that a boy could do as much as a mule, but was not allowed to kick, and reading one day while the impression was making itself felt the door of the shop opened, and "Loafing, as usual, you rat." greeted me, and I was told: "Come get a move on you and go with this gentleman and bring back the

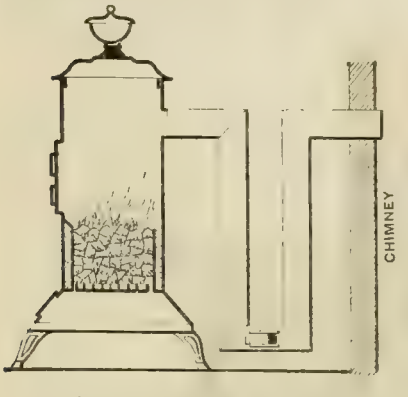


Fig. 1.—Stove Pipe Radiator.

package he sends." Right there I made two good friends, for before I could growl about being called a loafer the gentleman said: "A boy who reads *The Metal Worker* is never loafing, and if he reads it will never be a loafer," and taking him for a good fellow I started off. He asked me if I liked the paper. I said I never had looked at it before and did not know what it was. So he told me it is a paper that every apprentice should study, for instead of getting the ideas from only one shop and its jours it had a good many men all around the country sending in their ideas and asking for ideas on all sorts of work.

I told him I thought I would like to read it, but that I didn't have time to read at the store and the boss wouldn't let his copy leave the place, and I was going to ask him how to get it when he said that he had begun as I had and learned the trade, but now was on the road for a big house from which the boss bought, and as he traveled he picked up news and ideas which he sent in to the paper, and he thought he could get it sent to me easy enough if I would promise to study it and report to him whenever he came to town.

So I promised and he took my name, and the friendship thus made was one of the best I ever made. At first I looked at the pictures of all sorts of things and soon got the names of the makers of stoves, tinware, plumbers' goods and all that in my mind quite familiar, so that the talk I heard was not all Greek to me. Whenever I saw an old stove I looked to see who made it, and how it was made, and asked old Bill, our cyclopedia, why it was made that way, and he explained; but, while I understood, the way he murdered the United States language was simple slaughter, and I noticed the paper explained these things better. So while Bill helped me to understand the principle he said the paper put the polish on.

It wasn't long before I could go over a cook stove or heating stove and explain its construction, conveniences, operation and merits better than some of the salesmen, and they guyed me one day so the boss overheard and called me to him, telling me that no attention should be paid to such remarks, but to keep right on in the same way and I need never stand back for anybody.

As I could not do much in the shop and we were busy in the store, I often had a chance to sell stoves, and I told them the little sheet iron cylin ders with a brick lining and a cast base would work just as well, heat more space and burn less coal if, instead of running the pipe right into the chimney or right up the pipe hole, the pipe was run down to the floor first and then up to the pipe hole, as in Fig. 1, for then they would have more hot surface to heat with, both by radiation and by the air coming in contact with it.

I told them the door need never be opened except to add coal if a slide or register was put in the side of the pipe near the floor, which, when open, would take air out of the room, making it necessary for fresh air to enter, and at the same time checking the draft without cooling off all the upper part of the stove, which opening the door would do. Some said it wasn't pretty and wouldn't have it; others were not so much for style as for comfort and economy, and concluded a smaller stove would do, so the extra pipe didn't cost them more, and as the boss said he made more off the pipe than he did off the stove I talked for all I was worth.

I told them the same amount of coal in a sheet iron stove would heat a bigger room than in a cast iron stove because the sheet iron was so thin that it absorbed the heat from fire and passed it through to the room, and consequently so much heat was not wasted in the chimney. If they wanted a little better grade I always showed one that was an air circulator—Fig. 2. It had one sheet iron cylinder lined with fire brick setting on top of a cast iron fire pot, and outside of this was another sheet iron cylinder 2 inches larger in

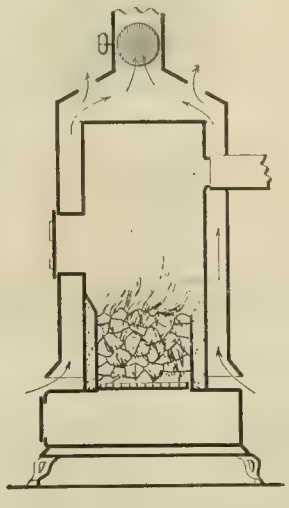


Fig. 2.—Air Circulating Stove.

diameter, made so that air went in between the two at the bottom, was heated, and then came out at the top into the room hot, keeping up a circulation and making all parts of the room warm nearly alike.

Sometimes these stoves had a pipe leading from the top to a register in the floor in the room above, which could be warmed nicely.

There was a damper in the heating pipe to stop off the hot air, when it came out of holes, arranged in a circle on the outer edge of the top, to the room in which the stove was placed.

Then we had another kind, better still, for in them was arranged a flue space under the ash pit and this was connected with the fire chamber by a flue at the back, so that by turning a damper the hot smoke had to go down this flue and all around the bottom back, to the flue and up on the other side of a partition in it to the smoke pipe and the chimney. In this way the fuel was burned slowly and all of the heat gotten out of it. This stove was also made as a circulator and to heat a room upstairs.

Being made of sheet iron the boss bought the castings and fire bricks and they were made in the shop, so I knew all about them and all that Bill knew; and my paper gave me a lot of hints about them, so they were my first loves and are yet.

I could not make them, but I made stove pipe, and by being a little careless and not knowing that a soft snap like making stove pipe could be made a heap of trouble, I made some with two big ends, some with two little ends, and Bill said some with both ends in the middle of the piece.

Well, maybe my arm wasn't tired before I got that lot of pipe right, but I learned a lesson I never forgot.

Prevention of Lamp Accidents.

In view of the numerous fatal and other accidents in England caused by petroleum lamps, the London County Council has lately issued a number of suggestions in regard to the construction and management of lamps, founded partly on recommendations by experts after investigation into the causes of accidents. These suggestions are divided into three groups. The first relates to the construction of lamps, and on this point it is strongly urged that the oil reservoir should be of metal instead of china, glass or other fragile material so commonly used, while it is further said that the wick should be inclosed in a tube of thin sheet metal open at the bottom and reaching almost to the bottom of the oil reservoir. Then it is recommended that every lamp should have a broad, heavy base and a proper extinguishing apparatus. The heavy base is an important matter as tending to prevent the upsetting of lamps, for the upsetting is one of the most fruitful causes of serious accident. Special attention is directed to the management of wicks, and as to extinguishing it is recommended that after the wick has been lowered till there is only a small, flickering flame a sharp puff of breath should be sent across the top of the chimney, but not down it.

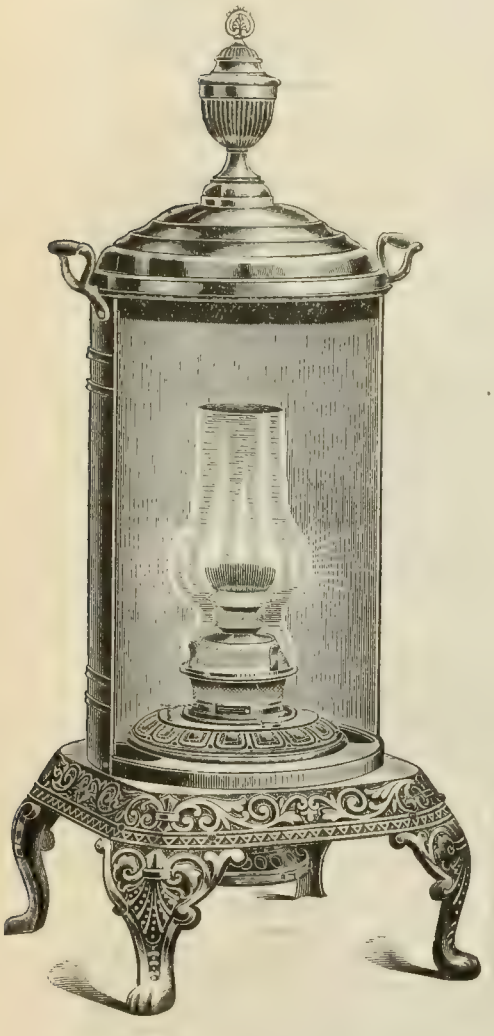
The colored enameled iron which is now being introduced in Europe is produced, according to a French journal, by dipping the iron sheets into an enameling liquid composed of 24 parts, by weight, of borax, 6 of soda salts, 15 of boric acid, 25 of washed sand, 12.5 of feldspar, 3.5 of saltpeter and 3 parts of fluorspar. The plates are dried and fired and the coloring is imparted by adding metallic oxides as desired.

A San Francisco firm have just ordered 25,000 tons of coal from Tonquin for use by California railroads. Tonquinese coal has for some time been in use in the French navy with excellent results.

THE RETAIL STORE.

Browne's Lamp Heating Stove.

The Breitting Metal Ware Mfg. Company, Huron and Sedgwick streets, Chicago, are manufacturing a recently patented oil lamp heater which is herewith illustrated. It is intended to be used for cooking and heating, as well as for light. The hight of this heater is 40 inches over all, while the diameter is 12 inches. The lamp is partly encircled by a highly polished tin reflector which fits into an opening in the base. Cold air is admitted from the floor, heated, and discharged at the top, causing a circulation of heated air in the room. The B. & H. lamp is used, which not only perfectly consumes oil without odor or smoke, but also provides a very brilliant light. The urn and top are nickeled, and in every respect the heater is handsomely finished.

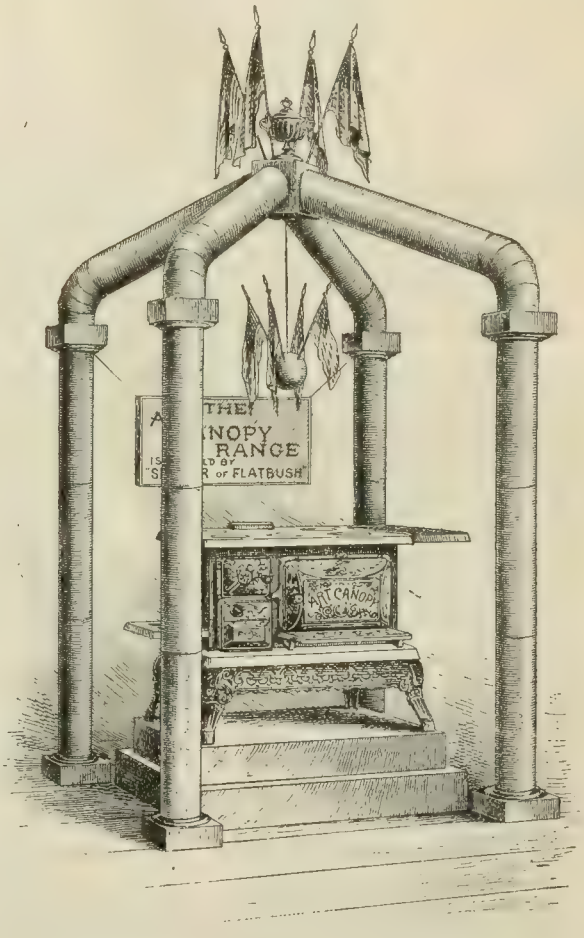


Browne's Lamp Heating Stove.

W. L. ADAMS has bought the stove, tin and plumbing business of F. W. Clarke, at Rome. N. Y., and will run it in future as Adam's Stove Store.

Donations to Fairs.

Our readers are familiar with the annoyance to which merchants are subjected in connection with requests for donations for fairs given in aid of charitable societies. We give herewith an account of the method adopted by an enterprising house, which is referred to as rendering substantial assistance to the fair, while at the same time they derived considerable benefit from it through the advertising which was secured.



An Exhibit at a Fair.

J. J. Snyder & Son of Flatbush, L. I., were recently requested to contribute toward a fair held by one of the local churches, and set to work to devise some method by which the donation could be turned to their profit. As it was the beginning of the stove season and a proper time to bring such goods to the notice of the public, they presented an Art Canopy Range, one of the best they had in stock, and secured the privilege of mounting it to the best possible advantage. This was done as shown in the accompanying illustration by placing it on a platform in a conspicuous part of the hall in which the fair was to be held, the platform being covered with bright red and canary colored cheese cloth. Above and around the Range a pavilion was constructed of Russia iron stove pipe and elbows, with bases and capitals of galvanized iron, the latter being ornamented with brass plated stove pipe collars. The four pipes were held together in the center by inserting the ends in a galvanized iron box with wooden top and bottom. This, in turn, was surmounted by a large stove ornament encircled by American flags placed in holes in the wooden top of the box. From the lower side of the box a wooden ball was suspended, in which were small American flags. The pavilion was also draped with bunting, but not so shown in the cut. Hung from and between the two rear columns was a sign, neatly framed, on which was lettering announcing that the Range in question is sold by "Snyder of Flatbush," their usual firm designation in their advertisements.

One of the conditions of the donation was that the Range should be drawn for at 10 cents a chance. The firm furnished cards as follows, with testimonials printed on the back:

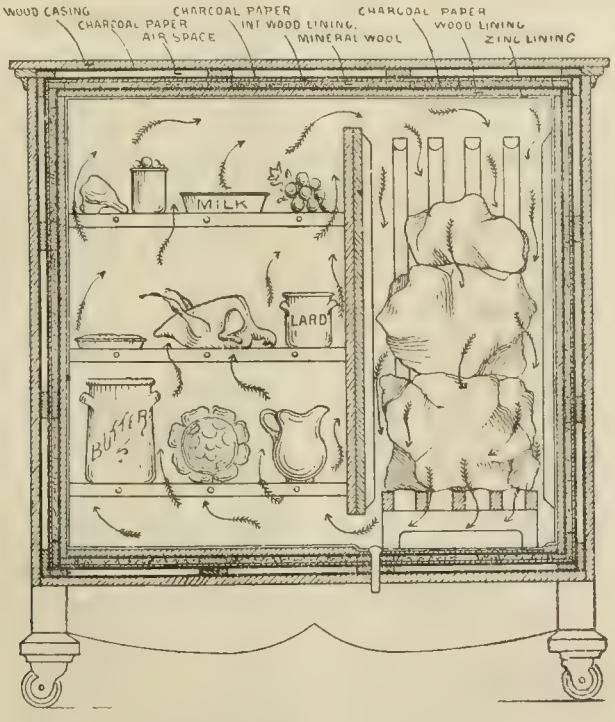
CHANCES, NOS ....
IN THE DRAWING FOR THE
"ART CANOPY" RANGE
AT THE FAIR OF THE
Holy Cross Cath. Church,
IN THE TOWN HALL,
SEPTEMBER 4th to 16th, 1893.

The trifling cost induced almost every person who visited the fair to

invest at least 10 cents, and thus several hundred testimonials of the Range given by residents were carefully carried to every section of the town. Although there were many articles on exhibition of tenfold greater value, nothing attracted more attention, and from the comments which the firm afterward heard they consider it the best advertising hit they ever made.

The Automatic Refrigerator.

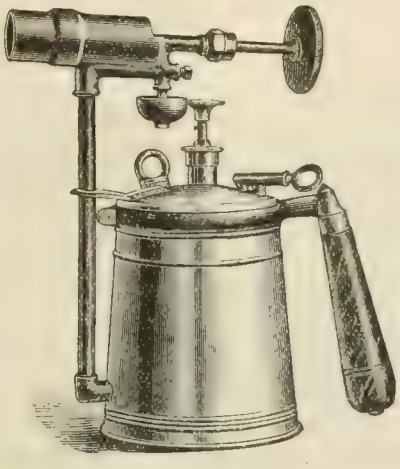
The Illinois Refrigerator Company, 909 Masonic Temple, Chicago, are manufacturing a new line of refrigerators. The illustration given herewith shows the distinctive features of the construction which has been adopted. It will be seen that the ice chamber is placed at the side of the provision chamber. The illustration also shows the manner in which the circulation of air is secured. The air in the ice chamber being colder and heavier than elsewhere, falls to the bottom and flows out under the partition into the provision chamber. The warmer air in the provision chamber flows over the partition into the ice chamber to take the place of the cold air passing out below. As it is cooled it falls. Thus a circulation is secured. The manufacturers state that as the vapors and odor from the food come in contact with the ice they are condensed and drawn off with the waste water from the ice. All the food being above the drip basin, it will be seen that no damage can result should the waste pipe become clogged.



Interior of Automatic Refrigerator.

The Quick Meal Adjustable Paint Burner.

The Quick Meal Stove Company, St. Louis, Mo., are putting on the market an adjustable paint burner, as shown herewith. The handle is adjustable, turning loosely on the brass band which encircles the tank, to enable the operator to throw the flame in any direction without exertion. The tank, pump, &c., are of brass, and the flame is referred to as being blue and very powerful, from 6 to 8 inches long. It is explained that for corners or places in wood work out of ordinary reach the burner will be found serviceable, as the flame can be thrown in any direction desired. The point is made that when the burner needs repairing it is not necessary to make a brazed or soldered joint, and that it is easily taken apart for cleaning and repairing. The burner is designed for the use of plumbers, painters, wood workers, &c.



The Quick Meal Adjustable Paint Burner.

Miller Oil Heater.

Edward Miller & Co., 10-12 College place, New York, and Meriden, Conn., are putting on the market a series of oil heaters, one of which is shown in Fig. 1. The Miller lamp, which is used, has two flame spreaders, one particularly adapted for heating purposes and one for lighting, although either can be used for the stove. The lamp is provided with an aluminum indicator, which will not corrode, for showing when the lamp is full. The lamp has a simple wicking and adjusting device, and no chimney is used with the heater, resulting in greater radiating power. The lamp rests on a heavy nickeled cast base, and is provided with a brass nickeled top. Top or bottom wick adjuster is provided, as desired. The heater cylinder is of Russia iron, with mica at the bottom, all resting on the body of the lamp. The point is emphasized that the cylinder is supported on and locked to the main body of the lamp instead of on the chimney gallery. After the cylinder rest is in place it is fastened on the lamp by an eccentric looking device. The heaters are made in five sizes and styles, designed to heat rooms from 8 to 14 feet square. By removing the cylinder and substituting a chimney, the lamp may be used for lighting purposes. Fig. 2 illustrates how the lamp is lighted with or without the chimney.

Fig. 1.—Miller Oil Heater.

Fig. 2.—Mode of Lighting the Heater.

Experiments are being made in Italy with light electric vehicles, somewhat larger than ordinary tricycles. The vehicles are equipped with a battery of ten cells, capable of yielding sufficient energy to propel them for from three to five hours.

STOVE TRADE NOTES.

Funeral Urns.

A friend of ours whose soul is lacking in the quality of reverence, and who does not believe that a custom or institution is right simply because it is practiced or exists, has had his profane attention directed to the style of ornamentation prevailing in heating stoves. One decorative feature has especially tormented him, and as a relief to his feelings he sends us the following gentle malediction:

I never knew until lately why it was I felt so sad at heart after visiting a store or warehouse where there was a lot of heating stoves. I thought it might be the chilling effect of the mass of cold iron, or the prevailing blackness of the stoves, or even the curious smell that distinguishes these pot leaded products of the foundry. But none of these explanations was at all satisfactory, and I long ago gave up the problem. The other day, however, when looking up a question in ancient history, I stumbled on an elaborately illustrated article on funeral urns, and then, of an instant, I understood what was the matter with the stove. Most of the (I believe you call them parlor heaters) are topped with a melody in cast iron, in careful imitation of the vase used by the ancients to hold the ashes of the dead. Of course there is a certain recondite relation between a stove whose purpose is to make ashes and an urn whose purpose is to hold ashes. And then, as we are somewhat apt to muse before a fire, a funeral urn is as good as a death's head to keep one's thoughts at a proper soberness.

Think again how suggestive a row of stoves on the platform of a hardware store is of an exhibit of old fashioned gravestones, both lines being equipped, one decoratively and the other suggestively, with these emblems of the funeral pyre; only the blackness of the stoves deepens still further the somber impression.

I wish some one among the stove founders would carry out the whole figure of mortality in its details. Have the stove legs broken sections of shin bones, the stove body skeleton ribs filled with mica, a cast iron skull at the top for a preliminary finish, and over it all one of those beautiful funeral urns. What better design for a good selling stove could the most querulous dealer wish for? It would be original enough to attract attention, which is the main feature, I understand, in wares of this order, and, furthermore, it should prove highly efficient as a heater. The frame work of the human body would offer not a half bad model for the frame work of a heating stove.

ACCORDING to some of the Milwaukee papers a meeting was recently held in that city between the representatives of the syndicates interested in North Milwaukee and the officials of the O. R. Luce Company of Kansas City, relative to a proposition of the latter to remove its stove manufacturing plant to North Milwaukee. The report states that several meetings with regard to the matter have been held during the past six months, and that while no definite arrangements have yet been reached, indications point to a satisfactory understanding in the near future.

Heating Stove Patents.

We present herewith the text of the decision of the Supreme Court of the United States in the case of the executors of Philo D. Beckwith, deceased, *vs.* the Detroit Stove Works:

SUPREME COURT OF THE UNITED STATES.

No. 64.—October term, 1893.

WILLIAM G. HOWARD and FRED. E. LEE, executors of PHILO D. BECKWITH, deceased, appellants, *vs.* The Detroit Stove Works.	Appeal from the Circuit Court of the United States for the Eastern District of Michigan.

(November 13, 1893.)

Mr. Justice Jackson delivered the opinion of the court.

This suit was brought by appellants' testator, Philo D. Beckwith, against the appellee for the alleged infringement of three letters patent, viz.: No. 123,142, issued January 30, 1872; No. 135,621, issued February 11, 1873; and No. 206,074, issued July 16, 1878, all for improvements in heating stoves, The defenses set up and interposed were that the patents were all void for want of novelty and patentable invention. Pending the suit, the patentee died, and the cause was revived and proceeded in the name of his executors. The court below dismissed the bill and complainants appeal to this court to reverse that decree.

The first patent, issued January 30, 1872, relates to an improvement in stoves, wherein an exposed fire pot section, cylindrical in shape and tapering downwardly, is fitted into the upper end of a hollow ash pit section. This fire pot has formed on the inner side of its lower end an annular flange on which the grate rests. The theory of the patent is that this flange, which may be cast on, or made separate from the fire pot, and riveted or otherwise fastened to it, is made of such a width that it will collect upon it a bank of ashes, which will have the effect of preventing undue expansion of the fire pot at the point of junction with the ash pit. Or, in other words, the collection of ashes on the flange will prevent such an expansion of the lower end of the fire pot as would cause it to leave its seat on the ash pit and expose an open joint at this point. The inventor stated in his application that he had found that the expansion of the fire pot is so great without the flange that the stove proves a failure; but with the flange cast on it at the point designated above, the joint will remain tight during the lifetime of the stove. The novelty involved in the patent consists entirely of the tapering cast iron fire pot with the annular flange or shelf formed on its inside lower end at the point where it joins the ash pit, and upon which flange the grate rests. The single claim is "the tapering cast iron section B with the flange or shelf c framed on it, as described and shown."

It was claimed by the appellee that this feature of the invention was so common in actual stove construction at the time the patent was issued as to be deemed obvious, and that prior patents, attaining the same results, had been granted which practically covered the same design or contrivance included in this particular patent. In support of this contention it was shown that a patent had been issued to Benjamin Brownell on September 18, 1868, for a soft coal hot air furnace, in which it appears from the drawings set out in the record that a tapering fire pot is one of the elements of his invention, although it is not described in the specification. The drawings also indicate, and it was established by expert testimony, that this tapering fire pot had a flange on the inside lower end, upon which the grate rests. At the trial a model of the Brownell patent was introduced in which it was shown that the model differed from the patent drawings in having the projecting flange at the lower end of the fire pot formed on the ash pit, instead of on the fire pot.

The appellee further showed that a patent was issued to A. Atwood, May 14, 1850, No. 7356, which has a flange projecting under the lower edge of the fire pot as wide as the outer rim of the grate. This flange is upon the ash pit and not upon the fire pot. A patent issued to Bush & Richards, No. 171,129, November 19, 1867, shows a construction like the Atwood patent, except that the fire pot is tapering.

It therefore appears in these three patents offered by the appellee in support of its contention that the invention of the appellants had been anticipated, that they contain a clear and accurate representation of the contrivance of the Beckwith patent; that even if the flange was formed on the ash pit instead of on the fire pot it was the equivalent thereof, because it performed the same function in the same way, and that the only function of the flange would be to collect a ring or bank of ashes at the base of the fire pot when the stove was in use.

If there is any material difference between the patent under consideration and those just discussed it is found in the width of the flange. The appellants lay particular stress upon the fact that the width of the flange in the Beckwith patent, which was to serve the primary purpose of permitting a bank of ashes to form upon it, which would have the effect of preventing the lower part of the fire box from becoming unduly heated—is greater than shown in the previous patents, but neither in the specification nor claim of the patent does the patentee indicate what shall be the width of this flange. The description of the invention is vague and indefinite and is not sufficient to enable those skilled in the art to construct it without experiment so as to attain the desired result. The width of the flange is a mere matter of degree, and if at the time of the invention the proper width of the flange to accomplish the purpose desired was known, then the patentee made no invention. If the proper width was not known at that time, it should have been described in the patent; as the patent is silent on this point, except that the drawings indicate that the width of the outside rim of the grate is the proper width for the flange, it can hardly be said under such circumstances that the vague and indefinite description of the width of the flange elevates it to the dignity of invention, for it has been shown that the stoves covered by the patents just discussed also had each a flange which performed the same function, although not specifically claimed in the patents. We think it is obviously apparent that the patent of appellants' testator has not only been anticipated, but that it is wanting in all of the elements of patentable novelty.

The next patent to be considered is No. 135,631, issued February 11, 1873. This patent is for improvement in wood stoves, and consists of the construction, combination and arrangements of the various co operating devices comprising the parts of the stoves by joining them together with short bolts or rivets, adapted to lugs or flanges, instead of long rods, which, when exposed to the fire, are liable to be burned off several times during the life of the stove. The claims are four in number, but the third is not claimed to be infringed. The general form of the fire pot is the same as in the former patent including the internal flange, which, it is alleged, now performs a triple function—viz., collecting ashes, as before; supporting the grate, as before, and securing the ash pit to the fire pot by means of bolts or rivets passing through holes in the flange. The three claims in controversy are as follows:

"1. The section A (ash pit) and section B (fire box), constructed and secured together by means of bolts or rivets, and the internal flange *b*, substantially as described.

"2. The sheet metal section C (body of the stove) fitted into the fire pot section B, and secured thereto by mean of bolts or rivets, substantially as described.

"4. The top plate or section G, secured to the section F by means of lugs and bolts or rivets, as set forth."

The first claim of this patent is the same as covered by the former patent of Beckwith, except that the fire box and the ash pit in the former patent were not bolted together. The second and fourth claims are also found in the prior patent, except that the parts are not riveted together, and the top plate, or section G of Claim 4 has in the older patent an annular depending flange entering the lower section instead of lugs. In the present patent the flange is shown riveted to the lower section.

It is shown conclusively by letters patent issued to J. H. Keyser, March 19, 1867, No. 62,961, and by No. 114,614, issued May 9, 1871, to Samuel Smith, and by patent No. 127,535, issued to H. Whittingham, that it was common to secure the various sections of stoves together by bolts and rivets, and unimpeached testimony shows that the Barstow Stove Company of Providence, R. I., since 1856, has made a stove in which a cast iron top and base are provided with lugs, through which holes are drilled for the purpose of riveting the sheet iron body of the stove to the top and base. These claims, in view of the state of the art, limited the novelty to the use of bolts and rivets, and it is too plain for discussion, or the citation of authorities, that this does not involve invention.

The third patent, No. 206,074, issued July 16, 1878, which the appellants claim has been infringed, contains two claims, both of which are in controversy, and substantially is for the invention of a circular grate having a thin closed portion, a thick open portion, strengthened by ribs, and with a toothed periphery opposite the open part of the grate. It appears from the record that a patent, No. 76,315, was issued to Mary E. A. Evard on April 7, 1868, which describes a grate with a closed back and open front, and the drawing in the patent clearly shows that the open front is thicker than the closed back, and forms ribs on the closed back. The only difference between this grate and the one under consideration is that the Evard one is rectangular to fit a rectangular fire box, while the Beckwith grate is circular to fit a circular fire box. The prior use of the elements contained in this patent are conclusively shown. The Rambler grate answers the first claim, except that both the open and closed parts are of the same thickness. The North American and Morning and Evening Star grates answer the first claim literally, except that they are rectangular instead of circular, and provided with holes in the plate part of the grate where the Beckwith grate has none. At the date of this invention it was common to make wood burning grates partly open and partly closed, with teeth at their ends, which serve exactly the same purpose as the teeth D of the patent. These grates are all used in cooking stoves, and are rectangular in form, while the Beckwith patent is circular in shape, but it cannot be maintained that there is any element of invention in making the grate fit the particular fire box of the stove to be constructed. To accomplish that end mechanical skill alone is necessary, and does not call for the exercise of inventive talent.

The appellants urge that the word "periphery" is a word of limitation confined to a circular grate. However this may be, it is conclusively shown that the Monumental grate, which was in public use for five years before application was made for the patent under consideration, contains all of the elements of the Beckwith grate, except that, being adapted for burning coal, it is cast in two pieces, while the Beckwith grate is cast in one piece. This does not involve patentable invention.

Our conclusions are that, as to the first patent, it was anticipated by prior patents, and is void for want of invention in not describing how wide the flange should be in order to accomplish the desired result. As to the second patent, it is void because the bolting or riveting together of sections of a stove was well known at the time of the invention, and the use of lugs with holes perforated through them was anticipated in other stoves and furnaces manufactured many years prior to the date of the patent. As to the third patent, it is void because the claims in it were clearly anticipated, and because it involves no invention to cast in one piece an article which has formerly been cast in two pieces and put together, nor to make the shape of the grate correspond with that of the fire pot.

Our opinion is that the judgment of the court below dismissing the bill should be affirmed.

Mr. Justice Gray was not present at the argument and took no part in the decision.

True copy.

Test:
(Signed) JAMES H. MCKENNEY,
Clerk Supreme Court U. S.

American Stoves Abroad.

Some idea of the impression that our modern heating stove makes upon the people to whom it is a novelty is gained from the following from the London *Ironmonger:*

Follows & Bate (Limited), Gorton, Manchester, engineers, are introducing some novelties in American slow combustion stoves. One of these is the Signal heating stove, for use in offices, shops, churches, chapels, public institutions, restaurants, schools, &c. It is finished throughout in the best manner, most of the decorative parts being nickel plated, while pretty medallion centers in porcelain ornament the panels under the top molding, and the body of the stove is surmounted with an elegantly designed vase, which has a semicircular base made of copper bronze. The stove is fed in the opening at the top under the semicircular base of the vase, which swivels on a stud. Not only is the front of the stove fitted with doors, but there are also doors at each side, this arrangement giving convenient access to the interior of the stove; and as all of them are covered with talc, the glow of the fire may be seen on three sides, thus presenting an appearance as nearly as possible approaching the cheerful brightness of an open fire place. The fire basket is very simply and scientifically constructed, and having rotary bottom bars, the contents can either be emptied into the ash drawer, or by slightly turning a key to and fro the fire can be gently disturbed without the necessity of using a poker. The flue is fitted with a regulating damper, and the stove is supplied with foot rests on each side, which are very neat and convenient; while a very handy contrivance, which can be used for boiling a kettle, is provided at the back of the stove. The Signal stove is constructed to burn hard or anthracite coal, or a mixture of ordinary coal and coke. Throughout all its parts the stove is most ingeniously constructed, and it is a very attractive specimen of the molder's art, the ornamental portions being of the best artistic design.

ODD PLATES.

THE WESTERN STOVE MFG. COMPANY of St. Louis, Mo., have removed their office and salesroom to their foundry and works, at the corner of Ninth and Dock streets, where they will be glad to receive their friends. The company have issued a circular letter calling attention to this change, and in connection therewith state that any orders with which the trade may be pleased to favor them will receive prompt attention.

REPORTS from Taunton, Mass., are to the effect that most of the foundries there located are working steadily and that the Weir Stove Company are very active in all departments filling orders.

THE PRESBREY STOVE LINING COMPANY of Weir, Mass., have commenced an addition to their works, which, when completed, will considerably increase their productive capacity.

SUPERINTENDENT MCFADDEN of the Auburn Stove Foundry Company, Auburn, Maine, states that the new styles and patterns of their stoves and ranges are proving very popular and that the works are in active operation filling orders.

A TRADE JOURNAL states that there are 246 applications for patents for stoves and furnaces awaiting action in the United States Patent Office.

GEORGE LEAR, Mount Vernon, N. Y., has enjoyed a good furnace trade this year, having set up 80 Cyclone furnaces.

A RECENT ISSUE of one of the Reading papers states that the Stove Mounters' Union has received its charter, and on November 19 the following officers were installed: President, George Fries; vice-president, William Kieth; treasurer, Edwin Houck; financial secretary, John Calhoun; recording secretary, George Lessig; trustees, J. L. Goodhart, John Smith and Thomas Dunn.

BUSINESS is said to be improving at the Clinton Foundry, Troy, N. Y., and a number of additional molders were put on November 27. The Empire Foundry is making casts three days in the week, but will soon be running the full quota of working days.

THE PERRY STOVE COMPANY'S foundry, on Van Rensselaer Island, Albany, N. Y., is now running with a full force, and orders are being received in a very satisfactory way. The management seem confident that the plant will run during the winter with a full force and on full time.

RATHBONE, SARD & CO., says our Albany correspondent, tell of a conversation between two men in front of their Acorn stove exhibit at the World's Fair. Two sightseers meeting there stopped and examined the stove display. One accosted the other, saying that he was a hoosier from Indiana. The other replied that he was a sucker from Illinois. They exchanged stove stories, and the Illinois man said: "My father moved from the State of New York before I was born to a part of the territory which is the State of Indiana; came all the way in a covered wagon with an ox team, and brought a Rathbone stove with him. I was born three days after Indiana was admitted to the Union. When I became old enough to have a home of my own I bought a Rathbone stove. Have bought one of Rathbone, Sard & Co.'s stoves since that, but still have the same identical stove I bought when I first started in life. How's that?"

F. M. BORDEN & BROTHER, 110 North Second street, Philadelphia, Pa., report a satisfactory trade in the Novelty line of goods, for which they are agents, and in repairs, which have been their specialty for years. They are now giving their attention to the goods which will be in demand next summer, and in addition to the new process vapor stoves, which they handle, they will have a line of both high and junior vapor stoves, with a generating burner, which they will run under the name of the Splendid Novelty. They will also be prepared to furnish the Challenge Iceberg refrigerators in various styles and finish. At present the oil stove trade is the most active with them,

Barler's Ideal oil heater and the Electric oil stoves, both finding great popularity with their trade.

THE YEAGER-HUNTER SPRING CITY STOVE WORKS, at their Philadelphia office, present, as one of their most popular attractions to the stove trade, the Queen Esther New Era range, a feature of which is a beveled edge plate glass in the oven door. The reception accorded this novel oven door panel has been highly satisfactory to the house. The panel is reported to be in high favor in the kitchens where it is used, as all that is going on in the oven can be plainly seen without chilling the contents by opening the door.

FRANK CAVANAGH, representing Roberts, Winner & Co., manufacturers of the Our Leader and Beechwood line of stoves and ranges, Quakertown, Pa., recently visited his friends in the trade at Philadelphia.

AMONG the kitchens that have been recently furnished with Clad's ranges and Clad's cooking utensils, manufactured by V. Clad & Sons, 117 119 South Eleventh street, Philadelphia, Pa., is the kitchen in the new extension at the Union League Club, the Hotel Metropole, the restaurant now being completed in the Betz Building and Kugler's restaurant, on Eleventh street, in which an oyster range of handsome appearance in full view of all the visitors to the place is made a feature.

FAITH, BELSON & Co., the stove house and repair dealers, at 229 Market street, Philadelphia, Pa., have installed a Magee combination hot air and hot water heater in their basement, which heats the entire building.

WM THOMSON, the Philadelphia representative of Orr, Painter & Co. of Reading, Pa., dispenses Sunshine all the year around to the stove trade.

H. FRICKE left the road for a few days and spent Thanksgiving at the Philadelphia house of the Keeley Stove Company, while Manager J. D. Hiestand made a visit to the foundry, at Columbia, Pa.

REEVES & HORNER, 42 North Second street, Philadelphia, Pa., in addition to being the agents for the March-Brownback Stove Company of Pottstown, Pa., make a specialty of stove repairs of all sorts, having laid out 8000 bins for the storing of these supplies. They have received a number of letters complimenting them on the promptness with which they fill orders.

VISITORS to the Pure Food Exhibition in the Industrial Art Building, Philadelphia, Pa., found the exhibit of Thomas, Roberts, Stevenson Company of stoves and ranges very interesting. Mrs. Rorer, the celebrated lecturer on cooking, used a gauze door range made by them in illustrating her lectures.

THE FOLLOWING ITEM is taken from the Minneapolis *Commercial Bulletin* of December 2: "By December 15 the stove trade for the winter will be practically over. In fact, it has now dwindled down to a practical end. The business season's trade has been anything but satisfactory. Only a small sorting has been done during the very season—October and November—when the best trade should have been enjoyed. A larger trade than usual was had in stove repairs and parts, showing that the consumers are making the old stoves last one winter longer than they would had times been better. Throughout the Northwest, as elsewhere, the stove trade is almost wholly confined to two fall months. Gasoline and gas stoves have cut down the spring trade in ranges to a mere fraction of the former volume. So the trade in heaters and wood and coal ranges will be quite dormant for another year."

DISPATCHES to the daily papers are to the effect that the Great Western Stove Works, at Leavenworth, Kan., have closed their plant and ceased, for the time being, the production of stoves and ranges.

THOMAS R. COOK, JR., who has had wide experience with both the stove trade and the builders, is busy making visits to explain the merits of the Clover Triumph range and the Triumph furnace made by the Philadelphia Stove & Iron Foundry Company of Philadelphia.

A RECENT ISSUE of the *Illustrated News*, published at Milwaukee, Wis., contains, under the title "A Silver Milestone," a very interesting account of the celebration of the twenty-fifth anniversary of the founding of the Brand Stove Company of that place. The article is illustrated with likenesses of Sebastian Brand, president, Julius Goldschmidt, vice president, and Fred. G. Brand, secretary and treasurer of the company. There are also given bird's eye views of the company's plant in 1868 and 1893.

E. D. PURVES, who is well acquainted with the stove trade in New Jersey, Delaware and Pennsylvania, is traveling that territory in the interest of the Fuller & Warren Company, Troy, N. Y.

WE ARE INDEBTED to C. Seabury of Southard, Robertson & Co., Water street and Peck Slip, New York, for a copy of a poster such as were distributed among the trade nearly 20 years ago. Both heating and cooking stoves are illustrated, the views being sectional, as well as general. One-quarter of the poster, which measures about 19 x 23 inches, is devoted to engravings of Elihu Smith's alternating parlor stove, which "was commenced in 1868, put into operation in 1870-71 and shown to the public from 1871 to 1875." The circular states that the stove was not patented until August 25, 1874. Another quarter of the circular is devoted to the Hecla, Dauntless and the Argand heating stoves, while the lower half of the poster is occupied by illustrations of cooks and heaters of unique styles and sizes. Among the names which are decipherable may be mentioned Smith's Troy Union cook stove, made both single and double, the Trojan Pioneer, the Capitol, Tocsin of Liberty, the Rainbow and the Pride of our Union. These are, for the most part, of the style generally recognized as step stoves, the elevated portion at the rear being utilized for baking purposes.

THE MASON & DAVIS COMPANY, 72 Lake street, Chicago, are enjoying an excellent demand for their combination coal and gas range. The number being sold is, perhaps, not so large as it would be if the times were better, but much satisfaction is expressed by the company that sales are as good as they find them, especially as this construction is not of the cheap class, but is intended for those with whom price is a secondary consideration. The Mason & Davis Company have built up a large business in all their goods by aiming to make something thoroughly reliable rather than cheap.

ROBERT ROBINSON & SON, 105 Lake street, Chicago, are making elaborate preparations for the next campaign in gasoline stoves and ranges. They have steadily increased their gasoline stove trade from year to year and confidently expect a heavier business next year than in any previous season. Their line will be a larger one and will include a process cabinet range. Solid brass burners will be used hereafter, to secure greater durability. Messrs. Robinson & Son also handle Red Cross coal and wood stoves and ranges and have besides built up a good furnace trade. They have had an unusually good business in furnaces this season, their sales running ahead of those of last year. This is remarkable, when the dullness in the building trade is taken into consideration. It is explained on the ground that the firm have been exceptionally fortunate in securing contracts for the renewal of furnaces that have been worn out.

A NOTICE IS ISSUED by E. D. Ransom & Co., Albany, N. Y., under date of December 6, informing the trade of the death of E. D. Ransom on November 12, and announcing that the business heretofore carried on under the above name will be continued. Brief reference is made to the foundry supplies of all kinds which they furnish.

Isaac C. Lewis, president of the Meriden Britannia Company, Meriden, Conn., died suddenly at his home in that city on Thursday, December 7, aged 81 years.

A call has been issued for a convention of tinsmiths and cornice makers of the State of Illinois, to be held at Bloomington, Ill., on January 1, 1894. The object is the formation of a State league, and a letter has been sent by D. B. Wheeler to those interested all through the State.

H. J. Nace, Third and Vine streets, Philadelphia, Pa., is one of the modern school of tin and sheet iron workers, who is up to all of the demands made upon his skill. He makes all kinds of sheet iron work and goods for business and manufacturing buildings and residences.

We have received from the Clayton Air Compressor Works, 43 Dey street, New York, a pamphlet entitled "The Widening Use of Compressed Air," being an article by Whitfield Price Pressinger, reprinted from the *Engineering Magazine*, and dealing with an interesting subject. As a means of power transmission it has been utilized to a considerable extent abroad, and the many purposes to which it is adapted are pointed out in the article referred to.

The total strength of the United States army on September 30, 1893, was 2144 officers and 25,778 enlisted men. For various causes the army lost 9456 enlisted men during the year and gained 9074 recruits.

The Commercial Cable Company have signed a contract with Siemens Bros. for a new Atlantic cable, to be laid next spring, between Ireland and Nova Scotia. It will be 2200 miles in length and will have the greatest known carrying capacity.

Certain localities in Ohio, West Virginia and other States are suffering from an acute visitation of the tramp plague.

TRADE REPORT.

The Iron Market.

As expected, the whole Iron and Steel trades are in a very comatose condition, nor is much improvement expected until the future is revealed, so far as the tariff is concerned. Reports are very conflicting, but on the whole tend in the direction that the Wilson bill will be forced through without serious amendment. Still, this circumstance deserves consideration on the other side, that the Washington correspondents proved pretty poor prophets lately when they foreshadowed the provisions of the Wilson bill and may be found erring again this time.

Welcome as an improved tendency would be, it is useless to deny that the incipient bull movement fathered by one of the Birmingham companies arouses little enthusiasm with other sellers and is not frightening buyers to any considerable extent. While it is to be sincerely hoped that it not a false start, the general situation does not encourage sanguine views very much. It is true that there have been speculative purchases, say 18,000 tons in all, 5000 tons of warrants having been transferred to England from New York and the rest having been bought in Philadelphia, also for English parties. Then the large Pipe contracts lately placed have led to covering, so that the sales have been heavy. But they have not filled up many sellers, who continue to offer Iron at the old rates. It is a fact, however, that further liberal Cast Iron Pipe contracts are in the market, say about 25,000 tons in all. On the other hand, the general foundry trade is very dull, and, for instance, in Chicago there have been requests for delaying deliveries of Iron.

Pig Iron.—In New York merchants and agents generally note a somewhat improved inquiry and a greater interest in the market, particularly as to the prices which may be fixed for next year's delivery. As yet, however, no advance is being asked by the majority of sellers, and a good deal of cheap Iron is being offered. Contracts for Cast Iron Pipe of some magnitude have been lately let at Washington and at Jersey City, and other work of a similar character involving somewhat large quantities is now or will be soon in the market. We quote: Northern brands, $14 @ $15 for No. 1; $13 @ $14.25 for No. 2, at tidewater. Southern Iron, same delivery, $13 @ $14 for No. 1; $12 @ $13 for No. 2; $11.50 @ $12.25 for No. 3; $11.75 @ $12.25 for No. 2 Soft, and $12.25 @ $12.50 for No. 1 Soft.

There is no perceptible change in the Pig Iron market in Philadelphia. The supply, while perceptibly smaller, is nevertheless as large in proportion as at any time during the whole year. There is very little Iron wanted, and what is wanted can be easily secured at the old prices, and in some cases at a little less than that. Consumption is very light, and will be still lighter during the next 30 days, so that there is no incentive for placing orders ahead, and especially so while the tariff is unsettled. Asking prices are about as follows, with sales chiefly in small lots:

No. 1 Foundry	$13.75 @ $14.25
No. 2 Foundry	13.00 @ 13.25

Chicago advices intimate that while there is some movement in small lots of local and Southern Coke Iron, it is confined to the absolute necessities of consumers. Inquiries for good sized lots of Southern Iron have led to no business, on account of the high prices asked by nearly all the Southern companies. A discouraging feature of the situation at present is the decrease in shipments to consumers, who are to a considerable extent asking for postponement of deliveries on contracts. This shows a falling off in the foundry business, which for the past month or six weeeks had materially improved. Some sales of Charcoal Iron are reported at prices a shade under our quotations. Quotations are now as follows for cash:

Lake Superior Charcoal	$15.50 @ $16.00
Local Coke Foundry, No. 1	13.50 @ 14.00
Local Coke Foundry, No. 2	12.75 @ 13.00
Local Coke Foundry, No. 3	12.25 @ 12.75
Local Scotch	14.00 @ 14.50
Ohio Strong Softeners No. 1	15.50 @ 16.00
Southern Silvery, No. 1	@ 13.75
Southern Silvery, No. 2	@ 13.25
Southern Coke, No. 2	12.15 @ 12.40
Southern Coke, No. 3	11.65 @ 11.90
Southern, No. 1, Soft	12.40 @ 12.65
Southern, No. 2, Soft	11.65 @ 11.90
Tennessee Charcoal, No. 1	16.00 @ 16.50
Alabama Car Wheel	18.25 @ 18.50
Jackson County Silvery	16.00 @ 16.50
Other Ohio Silvery	15.00 @ 15.50

The amount of Pig Iron changing hands in the Pittsburgh district is small, and prices are showing signs of weakness. The explanation given is that not enough Iron is being consumed and too much is being made, notwithstanding that production has been cut down to half. Where one consumer of Pig Iron can be found who is running his plant full time, ten can be found who are running to half capacity or less. Then, again, the stocks of Pig Iron on hand are very heavy, and as long as these conditions confront the market any betterment in price is believed to be out of the question. Quotations are as follows:

No. 1 Foundry	12.50 @	13.00	cash
No. 2 Foundry	11.50 @	12.00	"

There has been an almost complete cessation of Pig Iron buying during the week in Southern markets and no large contracts have been made for either long future or early delivery, but there have been liberal shipments on contracts recently made. The proposed new tariff is given as the reason for the restriction in buying, and no business of importance is anticipated for the present. There is more willingness to sell at the prices recently accepted for delivery until next April, or even longer, but it is useless to make the tender when there are no buyers, while, in fact, the recent sales have made the furnaces comparatively independent and there is no such urgency to sell as would cause lower prices to be accepted. There is little movement in Charcoal Iron, but it is not pressed for sale. Quotations are as follows:

Southern Coke, No. 1	$12.25 @ $12.50
Southern Coke, No. 2	11.00 @ 11.25
Southern Coke, No. 3	10.50 @ 10.75
Ohio Soft Stone Coal, No. 1	15.50 @ 16.00
Ohio Soft Stone Coal, No. 2	14.50 @ 14.75
Lake Superior Coke, No. 1	15.00 @ 15.25
Lake Superior Coke, No. 2	14.00 @ 14.25
Hanging Rock Charcoal, No. 1	18.50 @ 19.00
Hanging Rock Charcoal, No. 2	17.50 @ 18.00
Tennessee Charcoal, No. 1	14.00 @ 14.25
Tennessee Charcoal, No. 2	13.00 @ 13.25
Standard Southern Car Wheel	17.75 @ 18.00
Lake Superior Car Wheel and Malleable	17.00 @ 17.25

Metal Market.

Pig Tin.—Hardly anything has been done in the speculative branch of the market, and prices have remained almost stationary throughout the week. The uncertainties connected with the proposed revision of the tariff seem to be greatly responsible for the lack of animation. General trade conditions, however, are not without influence, since they suggest very conservative action. As near as can be calculated, the consumption here is well up to the average for this season, and it is calculated that spot stocks have been cut down to about 2500 tons, or less than the average amount. Purchases by jobbers and consumers have been on a moderate scale, however, and the demand at this writing is of very ordinary character. The design of the Wilson bill to remove the duty on Pig Tin is well received by the trade generally, and there is no doubt that whatever other feature of the measure may be modified before its passage, this provision will be carried through as proposed. Late dealings on the Metal Exchange were at 20.65¢ for spot and December delivery. Jobbers' prices for small lots are 21½¢ @ 22¢ ℔ lb for Straits Pig.

Copper.—Sales have been made recently of several million pounds of Lake Superior Ingot for future delivery, at 10½¢. The estimates range all the way

from 3,000,000 to 5,000,000 lb, exclusive of what may have been done *sub rosa*, as not uncommon, by the Calumet & Hecla Company, whose agents seem to prefer "mystery" to a plain statement of facts. If the truth were known, it would probably be found that the estimate given is below the actual amount of metal involved. On the Metal Exchange there has been a feeble effort in the direction of counteracting the effect of outside influences and a few "sales" were recorded there at considerably under the "street" prices. Waiving all the speculative doings, it seems very clear that 10½¢ is extremely inside price and that 10¾¢ @ 11¢ fairly reflects market value from sellers' point of view. Not as much as a rumor of large dealings in other Copper comes to notice, but the line of valuation has been raised to 10¢ upward for Electrolytic, and 9½¢ @ 9¾¢ for ordinary casting brands. The home consumptive demand is of moderate proportions, and it is not expected that sales will increase materially until well on into the first month of the new year, when consumers will have taken stock and satisfied themselves in respect of their financial standing. Prices for small lots are unchanged at last week's quotations, with a tendency to harden.

Sheet Copper. — Some fairly good transactions in Cornice Copper have been closed during the week, and a brisker movement is noted in the demand for spot material, which is presumably needed for the completion of some large building contracts in several localities. Jobbers' prices are inclined to stiffen in sympathy with the advance of Ingot; and, in any event, they appear more likely to advance than to recede in the near future should business be at all up to the average.

Pig Lead.—The market has remained almost stationary. New tariff proposals exerted a certain amount of sentimental influence, the bearing of which was in the direction of lower prices, but sellers have thus far made hardly any revision in their prices, and consumers are extremely indifferent. There is no difficulty in buying carload or larger lots at 3.40¢, delivery here this month or next. Bids above 3.30¢, the bullion quotation, are few and far between. In short, the market is looking rather weak and is positively dull at the present time. Jobbers' business is described as but a few degrees removed from stagnation, consumers displaying only the most languid interest in the metal. Prices are inclined to weakness.

Lead Pipe and Sheet.—Some interest in Lead Pipe has been evinced during the week, and a little more business, both spot and future, has been done, but the movement is believed to be only of a special and temporary nature. No change in prices is noted.

Spelter.—The market is much tamer than it was a week ago, and prices are, if anything, a shade easier. A few carloads of special brands were placed here at about 4¢, and reports from primal markets had it that Western consumers have purchased there recently at full figures, or the basis of 3.80¢ @ 3.85¢, Eastern delivery, for ordinary Western brands. There is no evidence of any particular pressure to sell, but the relation of supply and demand is slightly abnormal, and the prices above quoted would seem to fairly reflect present market value for ordinary brands. Jobbing price for small lots at store range from 4½¢ to 4¾¢ ℔ lb.

Antimony.—There has been a fair jobbing movement at about the former prices, otherwise the market remains flat.

Tin Plate.—Business in the market for Tin Plates has been of a strictly perfunctory character. The demand for spot goods has been small, and no difficulty is experienced in placing orders at former prices. Except for special sizes, and for some favorite brands of domestic Roofing Plates, few contracts have been made for future deliveries, and interest in all directions is for the moment very tame. Values have, moreover, a tendency to soften, particularly in the case of ordinary Cokes, which are in more liberal supply. The total volume of transactions for the week falls far below the average of December business, which is always more or less languid in view of the annual stock taking. This year, however, the computation of stocks will not, in most cases, be a very lengthy operation, as from all accounts consumers are carrying next to none at all. The actual cause of the dullness is more reasonably attributed to the disinclination of purchasers to lay in any unnecessary supply of Tin Plates, even at present low prices, in face of the probability of early tariff changes still further lowering values. The trade in general exhibit great uneasiness at the prospect of the imposition of an ad valorem duty in place of a specific tariff ; and it is believed that such an arrangement, if carried into effect, will operate to the benefit neither of the Government, the importers nor the consumers. The American Tinned Plate Manufacturers' Association met in semi-annual session at Pittsburgh on Tuesday, and decided, it is reported, that they would do no more work at their mills than is necessary until they knew the outcome of the coming tariff legislation.

A special cable dispatch from London to *The Iron Age*, dated December 6, reports on the British Tin Plate market as follows: In Tin Plate there has been hardly any business and the market remains flat. Prices are unchanged. Although makers appreciate the proposed reduction in the duty in the United States, they do not relish the ad valorem rate. Work has been suspended at the Waterloo works, Machen. Liverpool quotations for Plates were as follows:

IC Charcoal, Alloway grade	12/3 @ 12/9
IC Bessemer Steel, Coke finish	11/3 @ 11/6
IC Siemens " " "	11/6 @ 11/9
IC Coke, B. V. grade, 14 x 20	11/3 @ 11/6
Charcoal Terne, Dean grade	10/9 @ 11/

Sheet Iron.—The market for Black Iron continues extremely dull. The increase in production which has occurred of late has not met with any corresponding growth in the demand, and makers are seeking business actively without much success. Prices are marked down to the lowest level on record, and concessions in quoted rates are, without great difficulty, obtainable on fair sized orders. Galvanized Sheets are in ample supply, but the demand has not shown any noticeable increase. Prices remain steady at former quotations.

Chicago Report.

Scrap.—Consumers are purchasing Old Material steadily, but the quantity moving is not so large as in November. Dealers furnish the following list of buying prices, Chicago delivery:

	Per net ton.	Per lb
No. 1 Wrought Scrap	$7.00	....
Machinery Cast	7.00	....
Malleable Cast	6.00	....
Stove Plate (free of burnt)	5.00	....
Burnt Iron and Grate Bars	3.50	....
Sheet Iron and Hoops	2.00	....
Plow Steel and Breaking Stock	5.50	....
No. 2, such as Shovels, Hoes, &c	4.00	....
Old Boilers—whole (Iron)	4.00	....
" (Iron)—cut in single Sheets and Rings	6.00	....
Old Gas-Pipe and Boiler Tubes	5.00	....
Cast Borings	3.25	....
Turnings	4.00	....
Horseshoes	7.00	....
Copper Bottoms	....	5 ¢
Copper Clips and Heavy	....	7 ¢
Heavy Brass	....	5⅛¢
Light Brass	....	3⅛¢
Pipe Lead	....	2⅝¢
Tea Lead	....	2 ¢
Zinc	....	2 ¢
Rubber	....	4 ¢

Anthracite.—Dealers report a larger demand from consumers and the market is steady. Carload lots of 12 net tons or over are quoted as follows:

	Grate.	Egg, Sto. and Ch.
Chicago, Ill	$5.85	$6.10
Milwaukee, Wis	5.85	6.10
Kansas City, Mo	9.05	9.30
Council Bluffs, Iowa	9.05	9.30
Lincoln, Neb	9.20	9.45
Sioux City, Iowa	9.05	9.30
Aberdeen, S. Dak	9.10	9.35
Dubuque, Iowa	7.15	7.40
Madison, Wis	7.35	7.60
St. Paul, Minn	8.35	8.60
Burlington, Iowa	7.35	7.60
Des Moines, Iowa	8.80	9.05
Davenport, Iowa	7.15	7.40
St. Joseph, Mo	9.05	9.30
Leavenworth, Kan	9.05	9.30
Omaha, Neb	9.05	9.30

Colorado Anthracite.

COLORADO FUEL & IRON COMPANY.

Denver	$8.00
Pueblo	8.00
Colorado Springs	8.00
Leadville	8.00
Cheyenne, Wyo	10.00
All points between Denver and Missouri River	8.85

CONDITION OF THE

Hardware Trade.

THE volume of November business was certainly as large as could reasonably have been expected, and indicated a decided improvement in the general condition of trade. There continues to be a fair activity, though business still feels to a considerable degree the depression which has existed and is also restricted by the advance of the season, this being a time of the year when trade is usually quiet. Seasonable goods are moving freely, the demand being stimulated by the advent of cold weather, especially as many merchants deferred their purchases to a later date than usual. Holiday goods are also in request, but the demand is not as large as in more prosperous years. There is a good deal of inquiry by the large houses in regard to next season's orders and the disposition is shown to defer purchases. A good many orders are, however, being placed for shipment early in the year, and in some lines this class of business is referred to as nearly up to the normal volume. Up to the time when the Wilson tariff bill was announced there were evidences of a marked improvement in business and a much more confident tone than has characterized the market for some time, but the proposed reduction of duties has the effect of inducing an unsettled feeling, repressing trade, and leaving manufacturers and merchants in a state of not a little uncertainty. The prospect of a reduction in the tariff naturally makes the trade at large reluctant to purchase goods which they may be able to buy at lower figures in the near future, and there is a good deal of doubt as to the lines which will be thus affected and the extent to which lower prices will result. Manufacturers are also perplexed in the matter and in not a few lines are entirely at sea as to the effect which the proposed bill will have upon their interests, especially as it is not unlikely that some kinds of foreign Hardware which have not recently been sold to any extent in this country will be admitted in competition with American goods. The fact is that in not a few lines our manufacturers are not informed as to the European costs so as to figure definitely on the influence which the proposed bill would have upon their business. In many other lines, however, the manufacturers are aware of the disaster which the enactment of the proposed law would bring upon their business, and are naturally disposed to do little until they know the disposition which will be made of the bill. Opinions differ widely as to the prospect of its being enacted in the form submitted, many holding to the view that important modifications must be made in view of the injury which it would inflict on established industries. There is, however, general agreement that it will be for the good of the country to have the matter settled in one form or another at as early a date as possible, that the existing uncertainty may be removed and manufacturers and merchants be permitted to adjust themselves to the new conditions.

Advices from Chicago.—Trade shows some improvement as compared with last month, but it is still far below what it should be. It is estimated that sales are now from 30 to 40 per cent. below the customary volume of business at this season. The main demand is for seasonable and holiday goods, but general Hardware is steadily called for in small lots. The smallness of stocks in retailers' hands compels them to buy frequently, which is much to the annoyance of jobbers, who are obliged to break packages to meet the wants of such trade. Lead goods are lower, in sympathy with the decline in crude lead. Shot has been marked down to $1.40 for small sizes, and $1.65 for large sizes. Heavy Hardware jobbers have had an unusually heavy run of orders for sleigh stock, more than for several years past, caused by the abundance of snow throughout the Northwest and the prospect of a long sleigh season. In other respects Heavy Hardware has been less active.

Notes on Prices.

Wire Nails.—It is evident that the low prices ruling on Wire Nails have the effect of stimulating orders, and this influence, in connection with the general improvement in the tone of business, causes many merchants to purchase Wire Nails with more freedom than for some time past. Merchants are not, however, purchasing much beyond their early requirements, but the fact that stocks generally are depleted and broken increases somewhat the size of orders which are being given. Many buyers, however, are still holding off, as they do not care to purchase at all freely at the present dull season and with the uncertainty which attends the future course of trade. Prices remain as at our last review, at $1.15 to $1.20 for carload lots at mill, and manufacturers are refusing to make concessions from the lower of these figures except in very special cases. Buyers are watching the market closely, and are preparing to place their orders in case there should be reason to anticipate an early turn in the market toward higher prices.

Advices from Chicago. — All Wire Nail manufacturers report very large shipments for November. The Salem Wire Nail Company that month shipped 92,626 kegs from their Salem and Findlay mills, which is the heaviest month's product they ever turned out. December is expected to be a month of heavy shipments also. There are plenty of contracts to be filled, but there are also some sections of the country in which stocks were never so light at the beginning of the year, and from which orders are therefore anticipated in good quantities. Quotations for factory lots are continued at $1.30, Chicago. Small lots are selling at $1.35 from stock.

Cut Nails —We are unable to report any improvement in the Cut Nail market in the matter of prices, which remain as for several weeks past, at about 95 cents for carload lots at mill; this figure, however, being shaded to close buyers on good orders. There has been a fair activity considering the season and the condition of business in general, and the aggregate of sales during the past week or two has been fair. Small lots from store in New York are quoted regularly at $1.20.

Advices from Chicago.—The Cut Steel Nail trade is not so active as it has been, but manufacturers report a tolerably fair run of small orders, enabling them to keep in operation. Prices range from $1.15 to $1.20, according to the character of the order. Small lots from stock are quoted at $1.25.

Barb Wire—Low prices continue to rule in the market for Barb Wire, but there has been no further decline during the past week. Quotations are on a basis of $2.15 to $2.20 for carload lots of Four-Point Galvanized at mill. The demand is only moderate. The low prices ruling, while not inducing liberal purchases from the trade at large, enable the manufacturers, however, to dispose of a larger quantity of Wire abroad than has heretofore been the case, inasmuch as they are now enabled to enter some markets which have been supplied from German mills.

Advices from Chicago.—The year has now advanced to a point where orders for spring shipment of Barb Wire are beginning to make their appearance. Manufacturers of special brands are booking more or less business, and inquiries are reported for standard qualities. Manufacturers appear to be standing firmly at $2.35 to $2.40, Chicago, for Galvanized, and offers of heavy tonnage are stated to have been refused at a shade under the minimum quoted. Jobbers name $2.55 for small lots from stock, but are receiving very little business, as most of it is being handled by manufacturers.

Plain Wire.—Plain Fence and Market Wires, which have for some time been declining in price, have now touched a point considerably below anything in the experience of the manufacturers. For example, round lots of No. 9 Black Fence Wire can be bought at $1.40, with the usual advance of $\frac{5}{10}$¢ ℔ pound for galvanizing, f.o.b. vessel, New York, which of course means a correspondingly low figure at mill. A good deal of complaint is made by the manufacturers of the unsatisfactory volume of business even at the prices which are ruling. There is, however, an increase in the amount of Wire exported, as at ruling prices they are able to compete with German manufacturers. While the aggregate of this business is not as yet

large, the opportunity to dispose of goods in markets which have been out of their reach is referred to by some of the manufacturers as an encouraging sign.

Cordage.—The Cordage market is in substantially the same condition as for the past week or two, and the low prices recently referred to are still ruling. Reports in regard to the reorganization of the concerns connected with the National Cordage Company are current, but are not regarded by the trade as having any important or direct bearing on market values, even though coupled, as they are in some cases, with an intimation that an understanding as to price has been or will be reached by these and other manufacturers of Cordage. The present indications are that no serious attempt will soon be made by the manufacturers to agree as to production and prices with a view to controlling the market, as in the present condition of things this is not likely to be accomplished. Ruling prices are unquestionably low and leave but a meager margin of profit, and when an active demand sets in higher prices are likely to result.

Sad Irons.—The following net prices on the Sad Irons of Colebrookdale Iron Company, Pottstown, Pa., who are represented by Duncan K. Major, 103 Reade street, New York, are announced, terms 60 days or 2 per cent. discount for cash in ten days:

Crown Sad Irons:
No. 230. Plain Polished, $8.40 per dozen sets.
No. 235. Nickel Plated, $9 per dozen sets.
Extra Handles, $1.25 per dozen.
Extra Stands, 35 cents per dozen.
Common Diamond Sad Irons, 2¾ cents per pound.
The XX Tailor Irons—wide face, 4 cents per pound.
The XX Tailor Irons—narrow face, 4 cents per pound.
The XX German Tailor Irons, 4 cents per pound.
New England Pressing Irons, 4 cents per pound.
Chinese Laundry Irons, 6 cents per pound.
Chinese Common Sad Irons, 4 cents per pound.

Shot.—As a result of the decline in the prices of Lead, the following revised quotations on Shot are announced by the manufacturers under date December 4; terms, net 30 days, 2 per cent. discount for cash in 10 days:

Drop Shot up to B, 25-pound bag	$1.40
" " 5-pound "	35
Drop Shot B and larger, 25-pound bag	1.65
" " 5-pound "	40
Buck and Chilled, 25-pound bag	1.65
" " 5-pound "	40
Dust Shot, 25-pound bag	2.00
" 5-pound "	45

In lots of 2000 pounds and upward, taken at one time, a discount of 5 cents per bag (25 pounds) will be allowed. A special discount of 2½ per cent. will be given on lots of 1 ton and upward bought, invoiced and paid for at one time.

Curling Iron Heater.—The Ætna Curling Iron Heater, manufactured by Nicol & Co., 55 W. Washington street, Chicago, and illustrated in our issue of November 25, 1893, is sold at the following net prices:

No.	Per doz.
0. Without wire attachment	$1.75
5. With wire attachment	2.25

Glass.—The impression prevails that whatever tariff legislation may be enacted will not go into effect before June, 1894, and if such should be the case the price of Window Glass, or the wages of workmen according to the scale signed, would not be directly effected by the tariff. It is not improbable, however, that the prospect of a reduction of tariff will somewhat depress prices on Glass. Authorities state that the reductions proposed by the Wilson tariff schedule vary from 28 to 37 per cent. on Window Glass, while others estimated it at 50 per cent. Glass factories continue starting up; at the present time there is reported the equivalent of 1044 pots in operation. Prices on American Window Glass continue low, and there seems to be a disposition to make private prices rather than open quotations. Plate Glass is quoted by local jobbers at from 60 and 10 and 5 to 70 per cent. discount, according to size of Glass. It is understood that the regular quotations on French Window Glass of 75 and 10 and 5 per cent. to 80 and 5 per cent. discount are shaded in some cases. There is a limited demand for all kinds of Glass.

Old Metals.—The market for Scrap Iron is dull and weak, with prices at a very low level. The business that is passing consists of nothing beyond small lots for immediate delivery, and nothing in the nature of a general demand is in sight. Old Metals, other than Iron, on the other hand, have shown more movement during the past week. Inquiries and orders have come in more freely, and smelters and refiners appear to be busier than for some time past. Prices rule firmer, quotations for New York delivery being given as follows:

Heavy Copper	℔		7¢
Light and Tinned Copper	℔		6½¢
Heavy Brass	℔		5¢
Light Brass	℔		4½¢
Lead	℔		3¢
Tea Lead	℔		2¾¢
Zinc	℔		2½¢
No. 1 Pewter	℔		14¢
No. 2 Pewter	℔		6¢
Wrought Scrap Iron, ℗ gross ton	$7.00	@	$8.00
Heavy Cast Scrap, ℗ gross ton	8.00	@	9.00
Stove Plate Scrap, ℗ gross ton	4.00	@	5.00
Burnt Iron, ℗ gross ton	2.50	@	3.00

Old Rags, Paper, &c.—Paper Stock is fairly active, but the trade still continues much below the average for the season, and no material improvement is looked for until after the holidays. Quotations are as follows, delivered in New York:

No. 1 White Rags	℔	3¼ @	3½¢
No. 2 White Rags	℔	2¼ @	2½¢
Mixed Rags	℔		¾¢
Blues and 3ds	℔	1 @	1¼¢
Hard Sized White Shavings	℔	2¼ @	2½¢
No. 1 White Book Shavings	℔	2 @	2¼¢
No. 2 White Book Shavings	℔	1 @	1½¢
Light Book Shavings	℔		¾¢
No. 1 Mixed Shavings	℔	¾ @	1 ¢
No. 2 Mixed Shavings	℔	½ @	¾¢
No. 1 Printed Books	℔	1 @	1¼¢
Ordinary Mixed Books	℔	½ @	¾¢
Newspapers	℔	½ @	3-5¢
No. 1 Manila Paper	℔	1 @	1½¢
No. 2 Manila Paper	℔	⅝ @	¾¢
Bogus Paper	℔		½¢
Common Paper	℔	⅜ @	½¢
Straw Chips	℔	⅛ @	⅜¢
Binders' Clippings	℔	⅛ @	⅜¢
Jute Butts	℔	1⅞ @	2 ¢
No. 1 Jute Bagging	℔	1 @	1¼¢
Mixed Bagging	℔	¾ @	1 ¢
No. 2 Bagging	℔	⅛ @	¾¢
Hemp Twine	℔		2¼¢
Manila Rope	℔		2½¢
Jute Rope	℔	1½ @	1¾¢
Mixed Rope	℔	¾ @	⅞¢

Old Rubber.—The market for this material is narrow and weak. Prices in New York are about as follows:

Car Springs, ton lots, ℔	@	$0.03¼
Rubber Shoes, carloads, delivered at factory, ℔	@	.03
Rubber shoes, less than carloads, ℔	0.02¼ @	.03⅛
Large Hose, ℗ ton	@	9.00
White Wringer Rolls, ℔	@	.04¼
White Syringes, ℔	@	.05

Trade Notes.

TINNERS' MACHINERY & SUPPLY COMPANY, 9 Cliff street, New York, are distributing among their patrons a neat and useful souvenir in the form of a vest pocket memorandum book for use during the ensuing year. It is 5¼ x 2¼ inches in size, bound in fine black leather, rounded corners, gilt edged, quadrille ruled, and contains 36 leaves. On the cover in gilt is the name and address of the company, while on the inside of the covers and fly leaves they allude to their line of goods, leaving the balance of the book free for memoranda.

KEARNS & RUDOLPH RANGE COMPANY, 1020 Arch street, Philadelphia, successors to the Kearns Wrought Steel Range Company, are directing attention to their Hot Water Stoves. Besides heating large quantities of water, it is pointed out that the tops of the stoves can be used for heating flat irons or doing small quantities of cooking.

THE GEUDER & PAESCHKE MFG. COMPANY of Milwaukee, Wis., drop into poetry this week in advertising their Cream City Flour Bin and Sifter. The poet's lines may be a little lame in construction and difficult to scan, but the sentiment is all right and must meet with the hearty commendation of our readers.

A SHORT TIME AGO we called attention to the fact that E. T. Barnum, manufacturer of Wire and Iron Work at Detroit, Mich., received awards at the World's Fair on Steel Prison Jail Cells, Grocers' Cheese Safes, &c., and now we learn that he has received other awards on Wire and Iron Fencing, Wire and Antique Brass bank and office Railing and Lawn Vases. The exhibit was made very attractive by the selection and arrangement of the goods, while the workmanship was of a high order.

JOSEPH DIXON CRUCIBLE COMPANY, 68 Reade street, New York, manufacturers of Pencils, Crucibles and Graphite products, note signs of improvement lately in their business, although not to so great an extent as could be wished. They have instituted some improvements and betterments at their works, and are prepared to promptly execute orders.

THE HUYETT & SMITH MFG. COMPANY, makers of Heating and Ventilating Apparatus, Detroit, Mich., report a material improvement in their business. For the last three weeks their works have been running on full time in every

department and the company are even behind with their orders. The prospects for a good winter trade are very promising.

THE NEW PLANT of the United Indurated Fiber Company, Lockport, N. Y., has commenced operations. The plant will soon be running full force and will employ 300 men.

A NUMBER of additional sheet mills of the Ætna-Standard Iron & Steel Company, Bridgeport, Ohio, were started up last week.

THE GALVANIZING DEPARTMENT of the plant of the Whitaker Iron Company, at Wheeling, W. Va., which was not destroyed by the recent fire, is in full operation. As soon as the insurance on the destroyed buildings of the firm has been adjusted they will be rebuilt on a larger scale than before.

THE ALUMINUM SMELTING & REFINING COMPANY will shortly put in operation their smelting works, at Turner, in Kansas, a few miles west of Kansas City. It is stated that they will manufacture aluminum from native clay.

IT IS REPORTED that the sheet mills of the Britton Iron & Steel Company, known as the Lake Shore Mills, at Cleveland, Ohio, will be put in operation at once. It is intended to run the mills non-union.

THE NEW PHILADELPHIA IRON & STEEL COMPANY, New Philadelphia, Ohio, have been running three sheet mills for a few weeks past and will at once put others into operation.

THE SHEET MILL DEPARTMENT of the works of the Moorhead-McCleane Company, at Pittsburgh, which has been idle for some time, will resume operations within a few days, as a result of the agreement reached between the sheet manufacturers and the Amalgamated Association.

THE BROOKLYN PATENT SLATE TUB COMPANY were incorporated on December 6, at Albany, to manufacture Slate Tubs, Slate Mantels and Slate work of all kinds, in Brooklyn, N. Y. The directors are Ed. V. Brand, John S. Ladd, Wm. H. Daniell, F. J. G. Ladd and Albert Trignet of Brooklyn, and the capital stock $10,000.

D. A. HOPKINS COMPANY, Central Building, Liberty and West streets, New York, makers of Journal Bearings and Brass Castings for machinery, report an active business in their specialties. The firm's foundries, at 305–311 Tenth street, Jersey City, N. J., are quite busily employed.

THE WORKS of the East River Lead Company, 523 East Nineteenth street, New York, are busy in the production of Lead Pipe, Spelter and Solder, for which a better demand has recently developed.

IN a prominent announcement elsewhere of the Iron Clad Mfg. Company, 22 and 24 Cliff street, New York, some information, with an interesting illustration, is given of the well-known Iron Clad Milk Can.

THE CLEVELAND STAMPING & TOOL COMPANY, Cleveland, Ohio, issue a neat little publication, being a price-list of their Solid Steel Seamless Hollow Ware. On the first page is an illustration of their Solid Steel Spider, in the middle Seamless Griddles are illustrated and then their Seamless Broiler. Besides brief descriptions, tables of sizes and prices are given. A pretty effect is obtained by the red and black inks used in printing.

TRANSFERRING orders from the recently burned sheet mills of Wheeling to the mills at near by points in Ohio has made business lively in that line. The demand for galvanized sheets continues to hold good, the orders received being from all parts of the United States. This is regarded as a sure indication that building is going on at a lively rate. The use of this material for cornices and furnishings of buildings shows a steady increase.

THE ADAMS & WESTLAKE COMPANY, Chicago, issue a supplement to their No. 5 catalogue showing a large line of Brass Bedsteads, with prices and descriptions. A smaller pamphlet calls attention to a medal awarded by the World's Columbian Exposition for superiority of construction and excellence of finish and calls attention to some advantages and the care of Brass Beds.

THE STEEL CLAD BATH, manufactured by the Steel Clad Bath Company of New York, 447 West Twenty-sixth street, New York, and the Steel Clad Bath Mfg. Company, 85 West Congress street, Detroit, Mich., is the subject of an advertisement in another column, in which an illustration of the Tub is presented.

SCRAP.

NOBODY in the tin plate trade has ever known such low prices as those which have been current on the other side during the past few weeks. Yet, as an English trade journal points out, amid all the complaints of bad trade, it is astonishing to note the remarkable increase in the consumption. In 1882 the average price of IC coke tin was 18 shillings 9 pence, and the total quantity exported was 265,021 tons. In 1893 the average price is 11 shillings 6 pence, and the total exported (calculating the last quarter on the basis of the published figures) will reach about 402,240 tons. So that England is exporting 52 per cent. more in these bad times than in the good times of 1882, and the price is 38 per cent. less.

WALLACE, BANFIELD & Co., operating the Irondale Rolling Mills, at Irondale, Ohio, have placed an order with the Ellwood Iron Works of Ellwood, Ind., for two additional tinning pots and also two additional cleaning machines. When the erection of these has been completed the tinning department of the above plant will consist of six Morewood, two Thomas & White and two Ellwood tinning machines. The addition to these two tinning machines will increase the tinning capacity of the plant about 25 per cent., and it is the intention of the firm in the future to tin their entire output of black sheets.

KAHN BROS., 517–527 East Nineteenth street, New York, metal dealers and refiners, report a very gratifying improvement in business as having occurred within the last week or two. Their tin plate factory is busily engaged, turning out an average of 40 boxes of American roofing plates daily. Domestic black sheets are used exclusively and the firm are making a superior quality of genuine American ternes, for which they find an active demand.

THE HANDSOME BRANCH STORE which Merchant & Co. of Philadelphia have recently established at 584 and 586 Flushing avenue, Brooklyn, N. Y., is meeting with great success. The manager reports an active local demand for the guaranteed plates of the firm, namely, Merchant's Roofing and Alaska; as well as their cheaper grades of ternes—Empire, Hickory and Palm—and for the Sear ventilator. A full line of tinners' supplies is always kept in stock.

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Metal and Miscellaneous Prices.

CHICAGO, DECEMBER 7, 1893.

Tin—
Straits pigs.....23¢

Imported Tin Plates—
Charcoal Plates.—Bright.

Guaranteed Plates command special prices, according to quality.

		Per box.
Calland and Melyn Grade	IC, 10 x 14	@ $6.75
	IC, 12 x 12	@ 6.75
	IC, 14 x 20	@ 6.75
	IC, 20 x 28	@ 13.50
	IX, 10 x 14	@ 8.75
	IX, 12 x 12	@ 8.75
	IX, 14 x 20	@ 8.75
	IX, 20 x 28	@ 17.50
	DC, 12½ x 17	@ 6.50
	DX, 12½ x 17	@ 8.50
Allaway Grade	IC, 10 x 14	@ 6.50
"	IC, 12 x 12	@ 6.50
"	IC, 14 x 20	@ 6.50
"	IC, 20 x 28	@ 13.00
"	IX, 14 x 20	@ 8.00
"	IX, 20 x 28	@ 16.00

Coke Plates—Bright.

	Per box.
Steel Coke—IC, 10x14, 14x20.	$5.75 @$5.85
IC, 14x20.90 ℔	5.50 @ 5.60
IC, 14x20, 100 ℔	@ 5.85
10 x 20	8.75 @ 9.00
20 x 28	11.50 @12.70
IX, 10x14, 14 x 20	@ 7.35
B.V. Grade. IC, 10x14, 14x20.	5.85@ 6.00

Charcoal Plates.—Terne.

Guaranteed Plates command special prices, according to quality.

Hansel and Dean Grades.—	
IC. 14 x 20	@ $5.62½
20 x 28	@ 11.25
IX. 20 x 28	@ 14.25
Worcester Brand and equal.—	
IC, 14 x 20	6.12½@ .....
IC, 20 x 28	12.25 @ .....
IX, 14 x 20	7.62½@ .....
20 x 28	15.25 @ .....

American Tin Plates.
Charcoal Plates.—Bright.

Irondale, A. A.—IC, 14 x 20	$7.00
" " IX, 14 x 20	9.00
" " IXX, 14 x 20	11.00
" " IC, 20 x 28	14.00
" " IX, 20 x 28	18.00
" " IXX, 20 x 28	22.00
Florence.—	
IC, 10 x 14, 12 x 12, 14 x 20	6.75
IX, 10 x 14, 12 x 12, 14 x 20	8.50
Palma.—	
IC, 10 x 14, 12 x 12, 14 x 20	7.25
IX, 10 x 14, 12 x 12, 14 x 20	9.25

Each extra cross $2.00 and 20 x 28 double these prices.

Brilliant, Tissue Packed, IC, 14 x 20.	$9.25
Royal, extra, IC, 14 x 20	7.25
Merion, IC, 14 x 20	7.00
Almond, IC, 14 x 20	6.50
Mint, IC, 14 x 20	6.35

Coke Plates.—Bright.

Elwood.—IC, 14 x 20	$6.00
" IC, 20 x 28	12.50

Roofing Plates.

Arch, IC, 20 x 28	@$11.75
Crescent, IC, 20 x 28	@ 12.25
Crescent, IX, 20 x 28	@ 15.25
Empire, IC, 20 x 28	@12.50
Empire, IX, 20 x 28	@15.50
Hickory, IC, 20 x 28	@ 12.75
" IX, 20 x 28	@ 15.75
Alaska (heavily coated), IC, 20x28	@$14.50
Alaska IX, 20 x 28	@ 17.75
Special, IC, 20 x 28	@ 15.50
" IX, 20 x 28	@ 18.50
Merchant's Roofing (extra coated), IC, 20 x 28	@$17.75
Merchant's Roofing (extra coated), IX, 20 x 28	@$21.50
Merchant's Old Method, (extra heavily coated), IC, 20 x 28	@$19.75
Merchant's Old Method (extra heavily coated), IX, 20 x 28	$23.60
Irondale A:	
IC, 14 x 20	$6.25
IX, 14 x 20	7.75
IC, 20 x 28	12.50
IX, 20 x 28	15.50
Westmoreland:	
IC, 14 x 20	$6.25
IC, 20 x 28	12.50
Elwood:	
IC, 20 x 28	$12.00
Juno:	
IC, 14 x 20	$5.75
IC, 20 x 28	11.50
Illinois, Old Method:	
IC, 20 x 28	$17.00
E. L.:	
IC, 20 x 28	$12.50
Jessie:	
IC, 20 x 28	$12.00
Scott's Extra Coated, Stamped and Resquared, IC, 14 x 20	$9.50
Scott's Extra Coated, Stamped and Resquared, IX, 14 x 20	11.00
Scott's Extra Coated, Stamped and Resquared, IC, 20 x 28	19.00
Scott's Extra Coated, Stamped and Resquared, IX, 20 x 28	22.00
Neville, Stamped, IC, 14 x 20	6.25
" " IX, 14 x 20	7.50
" " IC, 20 x 28	12.50
" " IX, 20 x 28	15.00
Taylor's Old Style, IC, 14 x 20 (Stamped and Resquared)	$9.50
Taylor's Old Style, IC, 20 x 28 (Stamped and Resquared)	19.00
Taylor's Roofing, IC, 14 x 20 (Stamped and Resquared)	8.25
Taylor's Roofing, IC, 20 x 28 (Stamped and Resquared)	16.50
Columbia, IC, 14 x 20 (Stamped)	7.25
" IC, 20 x 28 (Stamped)	14.50
Maple, IC, 14 x 20 (Stamped)	6.75
" IC, 20 x 28 (Stamped)	13.50
Willow, IC, 14 x 20	6.50
" IC, 20 x 28	13.00
Knoxall, IC, 14 x 20	6.25
" IC, 20 x 28	12.50
Globe, IC, 14 x 20	6.00
" IC, 20 x 28	12.00
Miami, IC, 14 x 20	6.00
" IC, 20 x 28	12.00
" IX, 20 x 28	15.00
" (Redipped), IC, 20 x 28	17.00

Tin Boiler Plates.

	Per box of 100 sheets.	Per box of 112 sheets.
X, 14 x 28	$13.00	$13.00
XX, 14 x 28	14.50	14.50
X, 14 x 31	14.50	15.80
XX, 14 x 31	16.50	17.50
X, 14 x 56	29.50	16.50
XX, 14 x 56	32.50	18.20
X, 14 x 60	31.50	17.65
XX, 14 x 60	35.50	20.90

Sheet Iron—
Black.

	Common American	Refined.
Nos. 10 to 16	℔ 2 6-10¢	3 2-10¢
17 to 20	℔ 2 7-10¢	3 3-10¢
21 to 24	℔ 2 8-10¢	3 4-10¢
25 and 26	℔ 2 9-10¢	3 5-10¢
27	℔ 3¢	3 6-10¢

Russia, Planished, &c.

Genuine Russia, all numbers....13¢ net.
Patent Planished....℔ A, 10¼¢; B, 9¼¢ dis. 5%
Craig's Polished Sheet Steel.....8½¢

Galvanized.

Juniata or first quality.....dis. 70&5%

Copper—
Ingot.

Lake.....11¾¢ @ 12¼¢
Casting Brands.....11¢ @ 11¾¢

Sheet and Bolt.

Discount, 25%.

Copper Bottoms.

Discount, 25%.

Seamless Brass and Copper Tubes.

Base price, 17½¢, Chicago, with extras according to size.

Copper, Bronze and Gilding Tube, 3¢ ℔ additional.

Brazed Brass Tubing.
(To No. 20 inclusive.)

Add freight from New York to Chicago to these prices, or 50¢ ℔ 100 ℔.

Above 5-16 inch to 3 inch inclu...	35¢
Plain, above 3 inch	45¢
Plain, 5-16 inch	45¢
Plain, ¼ inch	60¢
Plain, 3-16 inch	$1.00
Plain, ⅛ inch	$1.50
Fancy Tubing, Brass, to No. 20 incl.	43¢ ℔
Bronze Tubing, 8¢ ℔ more than Brass.	

40 @ 45 %

Roll and Sheet Brass.

Discount, 35 @ 40%.

Slab Spelter—
Western Spelter.....5

Sheet Zinc—
600 ℔ casks.....5 ¢
300 ℔ casks.....5¼¢
Loose sheets.....5¾¢

Lead—
Soft Pig Lead.....3¾¢
Bar.....4¼¢
Pipe.....5½¢, dis. 10¢
Block Tin Pipe.....35¢
Sheet.....6¢, dis. 10%

Solder—
½&½.....12¾¢@13¼¢
Extra Wiping.....11½¢

The prices of the many other qualities of Solder in the market indicated by private brands vary according to composition.

Antimony—
Cookson.....12¢@12¼¢
Hallett's.....11¼¢@11¾¢

Wrought-Iron Pipe—
List on following page.

1¼ and under, Plain	57½&10%
1¼ and under, Galv	50½&10%
1½ and over, Plain	67½&10%
1½ and over, Galv	57½&10%
Boiler Tubes, list Oct. 24, 1892	65@67½%
Casing, list Nov. 16, 1892	52½%
Inserted Joints Casing, list Nov. 16, 1892	47½%
Steel Boiler Tubes	27½%
Cold Drawn Seamless Steel Tubing	50%

Cast-Iron Soil Pipe—
Cast-Iron Soil-Pipe, Tarred; sizes 2 to 6 inches, inclusive.....dis 70&10%
Other sizes.....dis 60%

Leader Pipes—
Abendroth's Galv. Spiral Riveted.....60%
Austin's Corrugated.....60%
Gordon & Gilbert's Corrugated.....60%
Ritchie's (Galv. Iron only) Cor'd.....60%
Ritchie's Spiral Lock Seam, Galv'd.....55%
Austin's Spiral Ribbed Pipe.....60%
Plain Adjustable Elbows.....60%
James A. Miller Bros. (Galv'd Iron only) Corrugated.....60%

Furnace Fittings—
Discount from Excelsior Steel Furnace Co.'s list.....50%

Steel Roofing—

Perfection	$3.75 square
Climax	$3.50 square
The Lloyd Spanish Tiling	$4.50 square

Metallic Shingles—

Cushman's	$1.25 square
Merchant & Co.'s Spanish Tiles:	
Copper, 14 oz	$36.00 square
Tin	$9.75@$14.25 square
Steel, painted	$9.00 square

Drain Pipe—*Tile.*
Discount from list.....70%

Paints Oils, &c.—

Deodorized Benzine	7½@8 ¢
Iron Paint, Bright Red	℔ ℔, 2 ¢
" " Brown	℔ ℔, 1½¢
" " Purple	℔ ℔, 2½¢
" Ground in oil, B. Red	℔ ℔, 6½¢
" Ground in oil, Red	℔ ℔, 6½¢
" Ground in oil, Brown	℔ ℔, 5½¢
" Ground in oil, Purple	℔ ℔, 6 ¢
Linseed Oil, Boiled, in obls	46¢
Linseed Oil, Raw, in bbls	43¢
Mineral Paints	2@4¢
Orange Mineral	10½¢
Pure White Lead in Oil	6¾@7½¢
Dry White Lead in bbls	6½@6¾¢
Red Lead, American	7@7½¢
Red Venetian, English, dry	$1.65@$1.70
Red Venetian in oil; asst'd cans, 8½¢; kegs	7½¢
Sipe's Japan Oil, in bbls, ℔ gal	34¢
Spirits Turpentine, in bbls., ℔ gal.	35½¢
Asphaltum, Trinidad Refined, ℔ ton	$45
Tarred Felt, 1 Ply, ℔ 100 ℔	$1.60
Tarred Felt, 2 Ply, ℔ roll 108 sq. feet	$1.25
Tarred Felt, 3 Ply, ℔ roll of 108 sq. feet	$1.70
Roofing Pitch, ℔ bbl. of 300 ℔	$3.00

NEW YORK, DECEMBER 8, 1893.

The following quotations are for small lots.

Aluminum—
No. 2 Grade Metal, in ton lots..℔ ℔, $0.75
No. 1 (guaranteed to be 98 % pure and over), in ton lots.....℔ ℔ .90
Lots less than 1 ton, 10¢ ℔ ℔ additional.

Antimony—
Cookson.....℔ ℔, 11¢
Hallett's.....℔ ℔, 10¼¢@10½¢

Brass—
Planished.....net
Roll and Sheet.....35@40%

Brass and Copper Tubes
Brazed Brass Tubing—
List May 20, 1889.

	Per ℔.
Plain, to No. 20 inclusive, above 5-16 inch to 3 inch inclusive	$0.35
Plain, to No. 20, above 3 inch	45
Plain, 5-16 inch to No. 20	45
Plain, ¼ inch	60
Plain, 3-16 inch	1.00
Plain, ⅛ inch	1.50
Fancy Tubing to No. 20, inclu	43

35@40%

Copper and Bronze Tubing—
8¢ ℔ ℔ more than brass.

Bronze, Tobin—
Drawn Rods for Bolts, Forgings, &c

Over ¼ to 3½ inches inclusive....17¢ ℔ ℔
Over 3½ to 5 inches inclusive.....18¢ ℔ ℔

Piston Rods, Finished True, Smooth and Straight.

Over ¼ to 3½ inches inclusive....18¢ ℔ ℔
Over 3½ to 5 inches inclusive.....19¢ ℔ ℔

Clips—
Buffalo Damper: Nos. 1, $1.25; 2, $2.50 per doz.....℔.....40&10%

Conductors—
Corrugated. *Round or Square*—
Galvanized.....60%
Galvanized, Locked Joints.....60%
Tin.....60%

Spiral Riveted—
Galvanized.....50%

See also *Elbows and Shoes; Eave-Trough Miters; Strainers, Conductor.*

Conductor Strainers—See *Strainers, Conductor.*

Copper—
Bottoms, Pits and Flats....25@25&5%

Ingot.

Lake.....11¢
Ansonia Grade Arizona.....10¾¢
Ansonia Grade Casting.....10¢
Planished.....net
Sheet and Bolt.....25&25&5%

Tubes—See *Seamless Brass Tubes.*

Coppers, Soldering—
See *Irons, Soldering*, in Current Hardware Prices.

Damper Clips Buffalo—
See Clips, Buffalo Damper.

Eave Troughs—
Lap or Slip Joint, Galvanized.....60&10%
Lap or Slip Joint Terne.....60%

Eave-Trough Mitres—
Lap or Slip Joint.....list, net

Elbows—
Plain Adjustable—
Tin.....70%
Galvanized.....70%

Crimped Tubing—
Re-Tinned or Galvanized.....35%

Stove-Pipe—
Buffalo Four-Piece.

4½	5	5½	6	7 inch,
$0.78	.87	.90	.99	1.20 per doz.

..20 %

Elbows and Shoes—
Flat Crimp.

Tin.....35%
Galvanized.....35%

Corrugated.
Flat Crimp.
Galvanized.....60%

Round or Square.

Tin.....60%
Galvanized.....60%

Iron, Sheet—
Black.

	Common American.	R. G. Cleaned American.
Nos. 10 to 16	℔ ℔, 2.70	3 ¢
Nos. 17 to 20	℔ ℔, 2.80	3.10¢
Nos. 21 to 24	℔ ℔, 2.90	3.20¢
Nos. 25 and 26	℔ ℔, 3	3.30¢
No. 27	℔ ℔, 3.10	3.40¢
No. 28	℔ ℔, 3.15	3.50¢
American B. B.	℔ ℔, 4¢@4½¢	

Russia, Planished, &c.

Genuine Russia, according to assortment.....℔ ℔, 11¾@12½¢
Patent Planished....℔ ℔, A, 10¢; B, 9¢, 5%
Craig Polished Sheet Steel.....℔ ℔, 8½¢

Galvanized.

	B. B.
Nos. 10 to 16	70%@70& 2½%
Nos. 17 to 22	
Nos. 23 to 24	
Nos. 25 to 26	
No. 27	
No. 28	
Nos. 29 and 30	

Filter Joints—
Lee's.....33½

Lead—

American Pig	4½¢@4¼¢
Bar	4½¢
Pipe	6¼¢, 20%
Tin Lined Pipe	15¢, 20%
Block Tin Pipe	37½¢, 20%
Sheet	7¢, 20%

Old Lead in exchange, 3¼¢ ℔ ℔.

Metal Exoanded—
Manufacturers' list No. 5.

Lathing	10%
Fencing, Painted Sheets	20%
Netting, Painted Sheets	20%
Door Mats, Galvanized	25%
Window Guards, Paneled	15%
Tree Guards, Paneled	15%

Mitres Eave-Trough—See *Eave-Trough Mitres.*

Paints Oils &c.—

Lead, Amn. White, in oil	6¾ @ 7¾
Lead, Red, bbls. and ½ bbls	6½ @ 7
Lead, Red, kegs	6¾ @ 7
Ocher, American	1 @ 1½
Red, Venetian, American	1½ @ 2½

Linseed Oil:
Raw, ₱ gal..... @ .40
Boiled..... @ .43

Spirits Turpentine:
In bbls..... @ .32

Putty:
In barrels and ½ bbls..... .01¾ @ .01¾
In tubs..... .01⅝ @ .01¾
In tin cans..... .01½ @ .02⅛
In bladders..... .01⅞ @ .02¼

Roofing Material, &c.:
Asphaltum, Trinidad Refined, ₱ ton..... $30.00@$35.00
Asphaltum, Rock, ₱ ton..... $14.00
Coal Tar Felt, 1 Ply, ₱ ₪..... 2¢
Coal Tar Felt, 2 Ply, ₱ roll 108 sq. ft. $1.42½
Coal Tar Felt, 3 Ply, ₱ roll 108 sq. ft. $1.85
Roofing Pitch, ₱ bbl..... $2.25

Pipe, Drain 50%

Pipe and Fittings, Cast Iron Soil—

Cast-Iron Soil Pipe, Tarred, sizes 2 to 6 Inches, inclusive..... 60@60&10%
Other sizes..... 55@55&10%
Cast-Iron Fittings, Tarred, sizes 2 to 6 inches..... 60@60&10%
Other sizes..... 55@55&10%

Pipe, Spiral—

Galvanized..... 60%
Tin..... 60%

Rock and Slag Wool—

	₱ ₪	₱ cub. foot
Slag Wool, ordinary	1¼	15¢
Slag Wool, extra	4¼	38½¢
Rock Wool, ordinary	2¼	27¢
Rock Wool, extra	7¼	43½¢

Rosin—

Omonom and Good—Strained,
Rosin, C. & D..... ₱ bbl. $1.33@$1.35
Rosin, E. & F..... ₱ bbl. $1.45@$1.57½
Rosin, G. & H..... ₱ bbl. $1.62½@$1.85
Rosin, I. & K..... ₱ bbl. $2.50@$3.00
Rosin, M. & N..... ₱ bbl $3.65@$4.20

Seamless Brass Tubes..ne

Shoes and Elbows—See *Elbows and Shoes.*

Slate Roofing—

According to size, f.o.b. cars, Quarry Station.

Pennsylvania:
Best Bangor, ₱ sqr..... $3.25@$4.50
Pen Argyle, ₱ sqr..... 3.50@ 4.25
Peach Bottom, ₱ sqr..... 5.00@ 6.25
No. 1 Chapman, ₱ sqr..... 4.00@ 4.65
Lehigh Slates, ₱ sqr..... 3.00@ 4.50
Vermont:
Sea Green, ₱ sqr..... 2.70@ 3.20
Purple, ₱ sqr..... 3.50@ 4.50
Unfading Green, ₱ sqr..... 3.50@ 4.00
Red, ₱ sqr..... 9.75@12.00

Solder and Soldering Fluids—

Solder—

½ & ½..... 13½@14½¢
No. 1..... 11¾@12 ¢
Prices of Solder indicated by private brands vary according to composition.

Soldering Fluids—

Concentrated Soldering Flux.
f.o.b. New York.
In barrels, ₱ ₪..... 4¢
Smaller quantities, ₱ ₪..... 5¢

Gedney's Soldering Fluid.
In carboys or barrels, ₱ ₪..... 2¢
$1.50 for carboy or barrel; money refunded when returned.

Perfection Soldering Flux.
No charge for package.
8lbs., about 500 ₪, ₱ ₪..... 31½¢
½ bbls., about 300 ₪, ₱ ₪..... 4¢
Kegs, about 110 ₪, ₱ ₪..... 4¢
75¢ extra for keg.
Kegs, about 55 ₪, ₱ ₪..... 4¢
} 5% dis.

Yager's Soldering Salts.
¼-₪ bottles, each..... 30¢
Large quantities, per ₪..... 40¢

Spelter—

Western Spelter..... 4½¢@4¾¢
Bertha..... 8¾¢@9¢

Spiral Pipe—See *Pipe, Spiral.*

Stove-Pipe Elbows—*See Elbows, Stove Pipe.*

Stove Polish—See *Polish, Stove.*

Stove Trucks—See *Trucks, Stove.*

Strainers Conductor—

Galvanized..... 60%

Tin, Pigs and Bars—

Banca, pigs, ₱ ₪..... 22½¢
Straits, pigs, ₱ ₪..... 21½¢@22¢
Straits in bars, ₱ ₪..... 22½¢@23¢

Tin Plates—

American Terne Plates—

Alaska (re-squared) IC, 14 x 20.... $7.00
Alderly, extra quality, IC, 14 x 20..6.37½
Allegheny, IC, 14 x 20..... 6.12
" IX, 14 x 20..... 6.38
Apollo Roofing, IC, 14 x 20..... 6.25
" " IX, 14 x 20..... 7.25
Bonus, Extra Coated, IC, 14 x 20... 6.75
" " " IX, 14 x 20.... 8.25
Buckeye, IC, 14 x 20..... 7.00
" IX, 14 x 20..... 8.25
Chicago, IC, 20 x 28..... 11.50
Central, IC, 14 x 20..... 5.37½
Climax, IC, 14 x 20..... 5.70
Columbia, IC, 14 x 20..... 7.00
Crescent, IC, 14 x 20..... 6.00
DeMilt's First New York, IC, 14 x 20. 5.75
" First New Jersey, IC, 14 x 20 5.50
" Mohawk, IC, 14 x 20..... 5.50
Dunlap's Double Dipped, IC, 14 x 20 8.25
" " " IX, 14 x 20 9.50
" Domestic, IC, 20 x 28.....12.00
" " IX, 20 x 28..... 15.00
Empire, IC, 14 x 20..... 6.12½
Extra Central, IC, 14 x 20..... 5.62½
Flag, IC, 14 x 20..... 5.50
Fort Pitt, IC, 20 x 28 ..... 11.00
Globe, IC, 14 x 20..... 5.75
Hamilton's Best Redipped, IC, 14x20 9.25
" " " IX, 14x20 10.75
Hickory (Resquared), IC, 14 x 20..6.37½
Juno, IC, 14 x 20..... 5.75
Kensington, IC, 14 x 20 ..... 6.75
" IX, 14 x 20 ..... 8.00
Knoxall, IC, 14 x 20 ..... 6.00
Laufman's Apollo (Resquared), IC, 14 x 20 ..... 8.12
Laufman's Apollo (Resquared), IX, 14 x 20 ..... 9.37
Leominster, Extra Coated, IC, 14x20 7.75
Lion (Stamped), IC, 14 x 20..... 6.25
Lula, Best Charcoal, IC, 20 x 28....12.50
" " " IX, 20 x 28....16.00
Manhattan, IC, 14 x 20..... 7.00
Maple, IC, 14 x 20 ..... 6.50
Merchant's Old Method (Resquared), IC, 14 x 20 ..... 9.50
Merchant's Roofing (Resquared), IC, 14 x 20..... 8.50
McKinley, IC, 20 x 28..... 12.00
" IX, 20 x 28..... 15.00
Neville, IC, 14 x 20..... 6.00
" IX, 14 x 20..... 7.25
N. F. Old Style, IC, 14 x 20..... 7.50
" " IX, 14 x 20..... 9.00
Old Colony, IC, 14 x 20..... 8.00
Optimus, Best Redipped, IC, 14 x 20 8.25
" " IX, 14 x 20 9.50
Osceola, Hand Coated, IC, 14 x 20.. 8.25
" " " IX, 14 x 20.. 9.75
Palacio, IC, 14 x 20..... 5.55
Pennsylvania Old Method (Treble Coated), IC, 14 x 20..... 8.50
Phœnix, IC, 14 x 20..... 5.80
Scott's Extra Coated (Resquared), IC, 14 x 20 ..... 9.25
Scott's Extra Coated (Resquared), IX, 14 x 20..... 10.75
Taylor Old Style (Resquared), IC, 14 x 20..... 9.25
Taylor Roofing, IC, 14 x 20..... 8.00
Thomson's Puritan, IC, 14 x 20.....5.75
Tip Top, IC (Resquared), 14 x 20.... 6.62
" IX " 14 x 20.... 7.88
U. S. Monongahela, IC, 14 x 20..... 6.50
U. S. Redipped, IC, 14 x 20..... 9.25
Venux, IC, 14 x 20 ..... 5.60
Waldo Redipped, IC, 14 x 20..... 7.25
Westmoreland, IC, 14 x 20 ..... 6.25
Wilkinsburg Redipped, IC, 20 x 28.16.00
" " IX, 20 x 28.19.00
Willow, IC, 14 x 20..... 6.25

American Bright Plates—

Almond, IC, 14 x 20..... $6.25
Brilliant (Tissue Packed), IC, 14x20. 9.00
Climax, IC, 14 x 20..... 6.50
" IX, 14 x 20..... 8.00
Florence, IC, 14x20..... 6.75
Hazel, IC, 14x20..... 5.80
Linden, IC, 14x20..... 6.50
Merchant's Dipped, IC, 14x20.....11.00
Merion, IC, 14x20.. ..... 6.75
Mint, IC, 14x20..... 6.00
Palma Xtra, IC, 14x20..... 7.25
Phœnix, IC, 14x20..... 6.25
" IX, 14x20..... 7.75
Royal, Extra, IC, 14x20..... 7.00
U. S., IC, 14x20..... 7.25

Imported Terne Plates—

Charcoal.
Dean Grade.—IC, 14 x 20.....@$5.50
20 x 28.....@11.00
IX, 14 x 20.....@ 6.75
20 x 28.....@13.50
Abercarne Grade.—IC, 14 x 20.....@ 5.40
20 x 28.....@10.80
IX, 14 x 20...@ 6.62½
20 x 28.....@13.25

Imported Bright Plates—

Charcoal.
Duty: 2.2¢ ₱ ₪.
Melyn and Cal-
land Grade. IC, 10 x 14.....@$6.50
" " IC, 12 x 12.....@ 6.75
" " IC, 14 x 20.....@ 6.50
" " IC, 20 x 28.....@13.00
" " IX, 10 x 14.....@ 8.50
" " IX, 12 x 12.....@ 8.75
" " IX, 14 x 20.....@ 8.50
" " IX, 20 x 28.....@17.00
" " DC, 12½ x 17.....@ 6.00
" " DX, 12½ x 17.....@ 8.00
Allaway Grade. IC, 10 x 14.....@ 6.00
" " IC, 12 x 12.....@ 6.25
" " IC, 14 x 20.....@ 6.00
" " IC, 20 x 28.....@12.00
" " IX, 10 x 14.....@ 7.50
" " IX, 12 x 12.....@ 7.75
" " IX, 14 x 20.....@ 7.50
" " IX, 20 x 28.....@15.00
" " DC, 12½ x 17.....@ 5.50
" " DX, 12½ x 17.....@ 7.00
Coke.
Steel Coke.—IC, 10x14, 14x20.....@$5.50
10x20.....@ 8.50
20x28.11.50@12.00
IX, 10x14, 14x20.....@ 6.75
B. V. Grade.—IC, 10x14, 14x20....@ 5.55

Imported Boiler Plates.—

IXX, 14x26..(112 sheets)..... ..@$13.35
IXX, 14x28..(112 sheets)..... ..@ 14.50
IXX, 14x31..(112 sheets)..... ..@ 16.00

Tinning—

Brass and Copper.....net

Tubing—

Tin..... 55%
Galvanized..... 55%

Brass and Copper.—

Standard List..... 35@40%

Troughs, Eave—See *Eave Troughs*

Trucks Stove—

Improved Lock Frame, per doz....$15.00
Steel Lock Frame, per doz..... 18.00
Daisy Improved Pattern, ₱ doz..... 18.00

Zinc—

600 ₪ casks..... ₱ ₪ 5½¢@5¾¢
Per ₪..... 6⅛

It Is Reported—

That Herman & Son, Hardware dealers, were burned out in a fire at Albia, Iowa, November 17.

That in a large fire at Hamilton, Ont., on the 22d ult., the Hardware stock of Peter Bertram was almost totally destroyed. Loss, about $20,000; insurance, $8000.

That W. L. Snow, plumber and dealer in Stoves, West Somerville, Mass., will add a line of Hardware to to his business.

That S. B. Spencer's Hardware store, at Maiden Rock, Wis., was entered by burglars on the 18th ult. Thirty Pocket Knives, two Revolvers and a lot of Table Cutlery were carried off.

That the Hardware store of J. E. Phillips, Porterville, N. Y., was burned out recently.

That the Hardware store of A. Scheff, 462 St. Clair street, Cleveland, Ohio, was entered by thieves on the 18th ult. The cash drawers were stripped of their contents and a large quantity of Hardware taken.

That Laughlin & Brown's Hardware store, at McComb, Ohio, was robbed on the 22d ult.

That the foundations for Charles E. Faeth's new wholesale Hardware store, at Sioux, City, Iowa, have been completed, and a large force of men have commenced work on the building proper.

That G. E. Piper has bought the Hardware stock of A. M. Smith, Silver Springs, N. Y.

That H. D. Blanchard of Boston, Mass., will on January 1 open a Hardware store at Vergennes, Vt.

That the Hardware store of W. C. Fluke, Clayton, Mich., was recently robbed. This is the second burglary within a year.

That W. R. Batley's Hardware store, at Hearne, Texas, was burned out on the 23d ult.

That the Hardware firm of Atchison & Knowlton, Newton, Kan., have been dissolved. T. B. Atchison will continue the business.

That McClure & Co., in the Hardware business at Buffalo, N. Y., have sold out.

That the Hardware and Tin firm of Schick & Bridanstein, Mansfield, Ohio, have dissolved partnership.

That O. P. Olson has opened a Hardware store at Ulen, Minn.

That P. Martinson & Son, Hardware merchants, Lake Park, Minn., have dissolved partnership.

That Heins, Rich & Co., in the Hardware business at Renville, Minn., have been succeeded by Heins & Co.

That M. I. Crosby's Hardware store, at Baldwin, Kan., was burned out on the 19th ult. Loss, $1500; insurance, $500.

That J. F. Johnston has sold out his business interests in the Hardware firm of Johnston & Farrar, London, Ohio, to his partner, Colburn W. Farrar. Mr. Johnston is the Mayor of London.

That G. A. Taylor has disposed of his Hardware business at Portland, Ore., on account of ill health.

That Wm. Haberman has bought the Hardware stock of I. M. Lyman, Concord, Neb.

That M. Quinlan and H. S. Latham have opened a Hardware and Tin store at Gray's Lake, Ill.

That burglars entered L. H. Kurtz's Hardware store, Des Moines, Iowa, on the 19th ult. and blew open the safe. They secured $55 in money and some valuable papers, some of them negotiable.

Price-Lists, Circulars, &c.

READING HARDWARE COMPANY, Reading, Pa., and 81 Reade street, New York: Supplement No. 4 to their 1891 catalogue. This is a book of 54 pages containing full size illustrations of a variety of new goods in genuine bronze and also a new line of fine Locks with flat and rabbeted fronts, for French windows, closets and doors having narrow stiles. The new patterns in solid bronze metal include complete lines of trimmings for Vassar and bit key Locks in scroll and circular fluted patterns. Eulalia designs and circular fluted door and window trimmings in wrought bronze are also shown. In addition to the supplement they publish an attractive 12-page pamphlet of iron goods in Columbian design. These goods are antique copper plated, which, the company state, is an entirely new method of finishing iron goods, requiring special patterns to obtain the desired results. This new finish is claimed to be very durable, and is referred to as presenting an appearance which closely resembles genuine bronze. The line of Columbian iron goods is limited to interior trimmings only. It comprises several Lock sets for inside doors, including sliding door Locks and Escutcheons, Door and Shutter Butts and a variety of small goods.

LABOR EXCHANGE.

Notices under this heading of reasonable length are inserted free of charge. Only those relating to employment are admitted. Write distinctly on one side of paper only, and do not use postal cards.

HELP WANTED.

A TRAVELING SALESMAN to represent a New York stove house. Address, with full particulars, "T. W.," office of *The Metal Worker*, 96-102 Reade street, New York City. Dec. 9

An experienced STOVE SALESMAN to represent a first-class line of goods in New York State; send reference, &c. "Stove Salesman," office of *The Metal Worker*, 96-102 Reade street, New York City. Dec. 9

A first-class TINSMITH who can furnish some capital to manufacture coolers; write for particulars. H. W. Gazley, 138 Groton avenue, Cortland, N. Y. Dec. 9

A young man who understands tinning and plumbing; none but steady, sober men need apply. W. E. Malony, Litchfield, Conn. Dec. 9

Boy to learn trade; can board with proprietor. G. F. Johnson, Linwood, Pa. Dec. 9

A SALESMAN to canvass retail and wholesale trade on automatic heat regulators for hot air, hot water or steam heaters, on liberal commission or salary and commission. W. B. Wilkinson, 210 Water street, New York City. Dec. 9

A first class STOVE SALESMAN for the Atlantic and Gulf States. "C. D. E.," office of *The Metal Worker*, 96-102 Reade street, New York City. Dec. 9

A strictly first-class TIN, COPPER and SHEET IRON WORKER on high grade custom work; a man who has been accustomed to make steam tables, coffee urns, carving tables, and with some experience on steel cooking ranges for hotels, restaurants, &c., preferred; to such a man steady work will be given by an old established house. Address, with all details, "Manufacturers," office of the *The Metal Worker*, 96-102 Reade street, New York City. Dec. 9

SALESMEN to sell on commission to the hardware, plumbing and rubber trade the best and cheapest line of lawn sprinklers made; see advertisement in this paper. Ette & Henger Mfg. Co., St. Louis, Mo. Dec. 9

A SALESMAN to travel for a leading manufacturer of warm air furnaces and hot water boilers; must be capable of directing work and estimating from plans and possess a thorough knowledge of the business; give references, experience and state salary desired. "Satisfaction," office of *The Metal Worker*, 96-102 Reade street, New York City. Dec. 2

SALESMEN visiting hardware, tinners and general stores to carry our goods as a side line. "X. Y. Z.," office of *The Metal Worker*, 96-102 Reade street, New York City. Dec. 2

AGENTS who are acquainted with the wholesale and retail hardware, tinware and stove trade to sell our line either on commission or salary; correspondence solicited. "Percy," office of *The Metal Worker*, 96-102 Reade street, New York City. Dec. 2

SALESMAN for New York City and vicinity; must be thoroughly acquainted with the trade; references. Rathbone, Sard & Co., Albany, N. Y. Dec. 2

SITUATIONS WANTED.

By a practical PLATER of gold, silver, nickel, brass, bronze, copper, oxidizing, &c.; also the Bower-Barff finish; capable of managing polishing, buffing and plating departments; good reference; steady and sober. "W. C.," 74 Frankfort street, room 20, Cleveland, Ohio. Dec. 9

As SALESMAN, by an experienced man in stoves and ranges, or mantels and grates. "H.," 1826 West Jefferson street, Louisville, Ky. Dec. 9

A young man of experience desires to represent some manufacturing concern connected with the hardware trade in Middle or Eastern States; can furnish evidence of ability, &c., and desires to negotiate soon. "R. L. S.," office of *The Metal Worker*, 96-102 Reade street, New York City. Dec. 9

An experienced young TIN and SHEET IRON WORKER wishes a steady situation in city or country; best of references. William Zepp, 19 Gold street, Bridgeport, Conn. Dec. 9

By a first-class man; is a capable accountant and business correspondent; experienced as manager. "F. D. P.," Kirby House, Watertown, N. Y. Dec. 9

By a young man who has had two years' experience at plumbing, to finish trade; steady work desired; city or country; A1 reference. Jno. P. Rahill, Cornwall-on-the-Hudson, N. Y. Dec. 9

SALESMAN of experience would like to travel in the West, for some good cutlery house, on salary or commission; good reference. Lock Box 213, Waldron, Mich. Dec. 9

As TIN and SHEET IRON WORKER and GENERAL JOBBER; can also do iron pipe and pump work; seven years' experience; distance no object. William Broom, Waldron, Mich. Dec,

By a first-class SALESMAN in the hot air furnace line; some experience in hot water; ten years' experience on the road; acquainted in the East and West; references exchanged. "Competent," office of *The Metal Worker*, 96-102 Reade street, New York City. Dec. 9

At liberty January 1, 1894, first-class FOUNDRY MANAGER and SUPERINTENDENT; 15 years' in charge of extensive works; thorough knowledge of range, furnace and machinery business, also conversant with steam and hot water heating, mechanical work and engineering; successful in handling men; close systematic manager; practical and executive; good references. "General Superintendent," office of *The Metal Worker*, 96-102 Reade street, New York City. Dec. 9

By a first class LEAD WORKER who also understands plumbing in all its branches; strictly temperate; steady job desired with good wages. "J. M. L.," 1655 Madison avenue, New York City. Dec. 9

By young man, 28 years of age, eight years' experience, as TIN and SHEET IRON WORKER, by January 1; can give best of references. S. E. McLaughlin, 255 Fair View place, Waukegan, Ill. Dec. 9

By a first-class TINSMITH; ten years' experience; strictly sober; steady job at inside work preferred; state wages. J. P. Bitzberger, 865 Manor street, Lancaster, Pa. Dec. 9

A1 STOVE SALESMAN is open for engagement in New York and vicinity or State. "Guarantee," office of *The Metal Worker*, 96-102 Reade street, New York City. Dec, 9

As SUPERINTENDENT of stove foundry, by a middle aged man; best of references. "W. W. G.," office of *The Metal Worker*, 96-102 Reade street, New York City. Dec. 9

By a married man, 26 years of age, with 12 years' experience in TIN and SLATE ROOFING and job and assortment work; strictly sober. W. C. Davis, 1024 Ash street, Winston, N. C. Dec. 9

By a man of 15 years' experience at the TINNERS' trade; can work inside or outside at general jobbing; also understands furnace work; would like a permanent place; no objection to going East or West; can furnish first-class references as to character and workmanship. C. H. Stauffer, Lock Box 374, Barberton, Summit County, Ohio. Dec. 9

For 1894, with a good stove foundry, by an experienced TRAVELER; acquaintance in the Middle, Eastern and Southern States; 20 years in the trade. "A. J. S.," Post Office Box 126, Wickford, R. I. Dec. 9

By a first-class TIN and SHEET IRON WORKER, with 12 years' experience at inside and outside work; can also do roofing, furnace work and general jobbing; fair knowledge of pump work and slating. "J D.," 171 Passaic street, Trenton, N. J. Dec. 9

A young man five and one-half years at plumbing trade would like a place in a country shop near New York; fair workman, honest and sober; reference if required; please state wages. "B. C.," Convent Station, N. J. Dec. 9

STEAM FITTER; practical man; 32 years of age; married; sober; can estimate; steady position with reliable firm. J. J. Rollins, Jersey Shore, Pa. Dec. 9

By a STOVE IRON PATTERN FITTER, capable of doing correct work. "J. L.," office of *The Metal Worker*, 96-102 Reade street, New York City. Dec. 9

As FOUNDRY SUPERINTENDENT or FOREMAN, by a practical foundryman and molder; 30 years in foundry work; 44 years of age; speaks both German and English; well posted on all lines of work; machinery, engine, architectural and furnace casting; capable of rigging up for the same; temperate and reliable; can give good references; has held positions of same character for the past six years; understands the management of cupola and the handling of men; is open for engagement January 1, 1894. "Foundrymen," office of *The Metal Worker*, 96-102 Reade street, New York City. Dec. 9

By an experienced STOVE SALESMAN, with references, a first-class and a cheap line of stoves for territory west of and including Colorado. P. O. Box 299, Highlands, Col. Dec. 9

By a good steady PLUMBER, city or country. J. Fitz, 222 East Eleventh street, New York City. Dec. 9

By an A No. 1 stove pattern fitter and stove mounter, as FOREMAN of mounting shop, or inspecting stoves, or at bench, if permanent; have held position as foreman past ten years, and can furnish references. Robert T. Norris, 165 West Delavan avenue, Buffalo, N. Y. Dec. 9

As TRAVELING SALESMAN or STOREKEEPER for plumbing supply house in any part of the United States; good education and ample experience to take charge of entire stock; the very best of references furnished. "J. W. S.," office of *The Metal Worker*, 96-102 Reade street, New York City. Dec. 9

SALESMAN of 15 years' experience and acquaintance with stove, furnace, steam, hot water, plumbing and hardware trade in Pennsylvania, New Jersey, Delaware, Maryland and New England States is open for 1894 after January 1; very best of references from present employer. "Salesman," care Chas. D. Scott, 269 South Third street, Philadelphia, Pa. Dec. 9

By a first-class TINNER, with large experience in all kinds of work; sober and reliable; steady job desired; city or country. "Tinner," Post Office Box 400, Fall River, Mass. Dec 9

By first-class TINNER; 18 years experience on outside and inside work; also some knowledge of plumbing work; can furnish tools if needed. "Tinner," P. O. Box 599, Negaunee, Mich. Dec. 9

By successful stamping works SUPERINTENDENT; thorough machinist, die maker; large experience laying out plans, starting and running new works, designing, building, labor saving tools and machinery; A1 manager of men, factory or machine shop; controls stamped article, pays good profit to manufacturer; best reference. "Stamping," office of *The Metal Worker*, 96-102 Reade street, New York City. Dec. 9

By a TINNER, experienced in furnace, jobbing and roofing work, a permanent job or as partner with some hardware merchant; have a set of tools and machines, but no capital. "W. M.," office of *The Metal Worker*, 59 Dearborn street, Chicago, Ill. Dec. 9

As home or traveling SALESMAN in New York State, by a man who has gone out of the stove and furnace business; can furnish abundant evidence of integrity and ability; will contract on commission basis if expenses are paid. "J. B. L.," office of *The Metal Worker*, 96-102 Reade street, New York City. Dec.

By a TINSMITH who is a good furnaceman and roofer. S. Teichman, 253 Stanton street, New York City. Dec. 2

By a first-class STOVE MOUNTER and PATTERN FILER. "T. C. X.," office of *The Metal Worker*, 96-102 Reade street, New York City. Dec. 2

By a young man 25 years of age in a hardware store as SALESMAN and TINNER; can do any kind of tin work, roofing and spouting; good references; can speak English and German. "T. P. S.," Box 103, Alexandria, Neb. Dec. 2

By a first-class PLUMBER, in city or country; sober and industrious; can furnish best of references. "R. J.," 349 East Fifty-eighth street, New York City. Dec. 2

A1 TINSMITH would like to correspond with parties wanting a good man. Frank Wilcox, Oxford, N. Y. Dec. 2

Any party wanting the services of an experienced man in steam and hot water or hot air heating can learn of such by addressing the Adams Radiator & Boiler Company, Reading, Pa. Dec. 2

By a first-class PLUMBER, in city or country; also good hot water, steam and gas fitter; sober, steady and reliable; references furnished. "Plumber," 19 Centre street, Yonkers, N. Y. Dec. 2

By a brass foundry FOREMAN, to take charge of a small foundry; a good hustler, who will manage same to advantage and help work himself and study employer's interes'; 25 years' experience; reference. C. E. McKenna, 68 Beech street, Paterson, N. J. Dec. 2

In a store or factory, by a STOVE MOUNTER who has had 15 years' experience in first-class work. P. Lohges, 552 Emmet street, Scranton, Pa. Dec. 2

By an experienced MILL MACHINIST on steam piping, shafting or any kind of mill repairs. J. Roberts, Lymansville, Providence, R. I. Dec. 2

By a young man, as TINSMITH; city or country. Fred. Waxman, 209 East Houston street, New York City. Dec. 2

Young man would like to be employed as a general hand in some good hardware store; good all around tinner; country store preferred; best of references. W. R. Thomas, 305 West Harrison street, Dunville, Ill. Dec. 2

THE METAL WORKER.

NEW YORK AND CHICAGO.

Saturday, December 16, 1893.

DAVID WILLIAMS, - PUBLISHER

BUSINESS OFFICES:

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ST. LOUIS.....Bank of Commerce Building.
CLEVELAND ..... 312 The Cuyahoga.

BRITISH AGENCY: The Ironmonger, 42 Cannon street, London, England.

A Specific Duty on Tin Plates.

At the close of last week it was announced that among the alterations decided on by the Ways and Means Committee in the original draft of the Tariff Revision bill, the proposed duty of 40 per cent ad valorem on tin plates was to be changed to a specific duty of 1½ cents a pound. This arrangement—at least so far as the substitution of a specific for an ad valorem tariff goes—is one that meets with the hearty approval of the tin plate trade in general, who, as we pointed out last week, were unanimously opposed to a tariff based on estimated value. The additional proposal that the new tin plate duty does not take effect until October 1 does not, however, command the same unanimity of approval. Opinions on this head are sharply divided. Domestic tin plate manufacturers will generally be glad of the postponement, which will give them a longer time wherein to adjust their business to the new conditions. Can makers and other manufacturers of tinware who are carrying stocks of any size will also be gratified at the extended opportunity afforded them of another season wherein to dispose of their goods at the present values. But many jobbers and importers and a large class of customers would prefer that the change should be made at an earlier date. They claim that postponement will certainly involve a continuation through next year of the present hesitating and unsatisfactory market, as no one will care to purchase beyond his absolute necessities, in view of the probability of cheaper material in the near future. The foregoing is, of course, based on the assumption that the Wilson bill will be passed as at present outlined.

Trade-Marks.

A decision of considerable interest to manufacturers and others using trade-marks has recently been handed down by the United States Supreme Court in the case of a suit brought by a firm of millers to restrain another firm of millers from using the word "Columbia" in connection with their special brand of flour. The court refused to grant the application of the plaintiffs, and denied their exclusive right to use the word "Columbia" as a trade-mark for flour; laying down, at the same time, the following comprehensive propositions as the sole rule and practice in the establishment of a valid proprietorship in trade-marks:

1. That to acquire the right to the exclusive use of a name, device or symbol as a trade-mark, it must appear that it was adopted for the purpose of identifying the origin or ownership of the article to which it is attached, or that such trade-mark must point distinctively, either by itself or by association, to the origin, manufacture or ownership of the article on which it is stamped. It must be designed as its primary object and purpose to indicate the owner or producer of the commodity, and to distinguish it from like articles manufactured by others.

2. That if the device, mark or symbol was adopted or placed upon the article for the purpose of identifying its class, grade, style or quality, or for any purpose other than a reference to or indication of its ownership, it cannot be sustained as a valid trade-mark.

3. That the exclusive right to the use of the mark or device claimed as a trade-mark is founded upon priority of appropriation.

4. Such trade-mark cannot consist of words in common use as designating locality, section or region of country.

The Blower System on Shipboard.

At the present time nearly a dozen of the ferry boats plying between New York and its adjacent cities are fitted with a special system of hot blast heating. The apparatus is so constructed that either hot or cold air, or any desired mixture of the two, may be supplied without change in volume. There is thus maintained in the cabin a constant moderate temperature, in marked contrast to the hothouse atmosphere sometimes encountered. The slightest pressure maintained within tends to prevent inward leakage of cold air from out of doors with its objectionable results. That the quality of the atmosphere is far above the usual standard in such apartments must be evident, for the fresh warmed air is supplied in large quantities. The same system, in a much extended form, is now under serious consideration for transatlantic liners, where fans would be provided both to supply the warmed air taken directly from out of doors and to remove the vitiated air from the confined spaces within. That such arrangements are more than desirable in the steerage is best evidenced by the general condition of steerage passengers. But its opportunity is not here alone, for there is yet room for improvement in the ventilation of the first-class cabins.

The Tin Plate Trade.

Some advantages derived from the establishment of a tin plate industry in this country have been strikingly manifested during the business depression of this year. Jobbing houses have been enabled to curtail their stocks of tin plates just as they have curtailed their stocks of other goods. Instead of purchasing large quantities, as they would have been obliged to do if importing, and thus having a considerable amount of capital steadily tied up, they have drawn on the manufacturers for just what was needed for an assortment from time to time. American manufacturers of tin plates have thus had to carry stocks for their customers in the same way that other manufacturers have been obliged to do in every time of depression or falling markets. It is an advantage so much appreciated that frequent reference is made to it by jobbers who are solicited to buy foreign tin plates. Within a few days a very large order has been secured by a Western tin plate works from a jobber, with the understanding that shipments are to be made in such quantities as are needed to supply his trade, with payments made accordingly. There is little question that the general depression in business has operated greatly to the advantage of American tin plate makers in this way, and that their trade has grown much faster among jobbers than would have been the case in the same period if money had been easy and the times prosperous. Manufacturers of tinware have pursued the same policy as the jobbers, but perhaps not to the same extent, as they could not run the risk of finding themselves suddenly out of stock.

It is proposed to hold a Workingmen's International Exposition in Milan, Italy, next year, which, if carried out on the broad lines contemplated by the promoters, with the co-operation of the Government, should yield valuable results. The exhibits are to be divided into three general classes, namely: Works, which will include products of individual workers, small industries, household work, products of co-operative societies, &c.; provisions, which will embrace the work of societies for mutual aid and improve-

ment, institutions, models, studies and material for showing how workingmen live, dress, &c., in various countries, as well as hygiene and bibliography in relation to workmen; and instruction, in which class will be displayed all matter relating to industrial schools and professional schools for different trades and callings. If sufficiently representative in its exhibits, such an exposition would be eminently instructive and useful.

The President of the Board of Education of Boston, in a recent address, congratulated his fellow citizens upon the fact that Boston has her system of public schools and kindergartens, and lately her public school of manual training; but what is now urgently needed, he said, is a school of practical training in the trades, such as the Pratt Institute of Brooklyn, the New York Trade School and other similar institutions furnish. Boston has now the most favorable opportunity for supplying this deficiency, if the trustees of the Franklin Fund adhere to their decision to use that fund in establishing a trade school for the benefit of the young mechanics of the Hub.

Plucking up Courage.

The West, says *The Iron Age*, was hit particularly hard during the financial flurry of last summer. Bank failures were more numerous by far than in the East or South. Business was therefore depressed more than in other sections of the country. Chicago, it is true, was abundantly supplied with currency on account of the World's Fair, which drew supplies from all sections, and St. Louis was almost phenomenally free from financial disturbances, but both cities suffered greatly through the prostration of general business in contiguous territory. Recovery has been very slow from this condition, but there are indications now of growing confidence in the minor industries, which form a very important part of the business fabric. Establishments which have been closed for lack of work and others that have stood idle since the bankruptcy of their owners are now getting into operation again. Their wheels may move slowly for a time, and but few workmen may be employed instead of the usual force, but that is to be expected. A great point is gained when the way opens for an actual start. A prostrate man gets on his knees before he rises. The fact that he can get on his knees, however, shows that he is trying to get up. It is just so with the manufacturers to whom we allude. Their efforts to run on part time or with partial force show that they have not lost all their business courage, and once having made a start they will not only acquire more confidence themselves, but will instill some into their neighbors.

While great operations will be checked until the uncertainties of tariff legislation are cleared up, there is, nevertheless, continual consumption or waste, which must be renewed. The country cannot come to a complete standstill with all the consumption stopped. The heavy curtailment of productive industries during the past summer and autumn cut down the stocks of manufactured goods in many lines to a point requiring almost an uninterrupted flow of those goods from loom or workshop through the hands of distributors to the consumer. Such a movement as this cannot be stopped unless the purchasing power of the people is absolutely cut off or factories get to running more generally and accumulate stocks in excess of the wants of the people. Neither of these contingencies is imminent. On the contrary, there is a decided probability that consumption will continue to increase, keeping pace with the gradual increase in output. This statement may be criticised by those who only draw comparisons between their present volume of business and that of the corresponding time last year, but it will be approved if comparisons are made on the basis of conditions ruling last summer and during the early weeks of autumn.

There is a disposition among Western business men to take quite a hopeful view of the situation, except perhaps those who are directly interested in iron ore mining. The rapid accumulation of money at the financial centers, surpassing anything previously known in the history of the country, is looked upon as affording a strong argument in favor of an early improvement in general business. The savings banks of Chicago, by concerted action, have reduced the rate of interest on deposits from 4 to 3 per cent. per annum, with the avowed object of discouraging further deposits and to force surplus money into business channels in which it will do more good than in the savings banks. At the same time important local projects are coming forward for the investment of capital, the promoters being inspired by the belief that this is a good time to launch them when money is abundant, the rate of interest is low, materials of all kinds are cheaper than ever before known, and labor is anxious to be employed. They argue that the time to make great improvements is when business is depressed and every advantage is on the side of the capitalist, instead of waiting until times improve and labor and material are in active demand.

The impression is also gaining ground that the new Tariff bill will be passed in the form in which it has been reported, but that modifications will be made in its most radical provisions. Whether this impression is well founded or is merely born of a spirit of excessive hopefulness, it is having an effect on quite a considerable class of manufacturers and business men, who are, therefore, eliminating the tariff question from their consideration of influences governing the course of trade within a reasonable period in the future. If they have accurately diagnosed the tariff situation, and the bill is amended as it progresses so that great interests are not seriously disturbed, there is no other obstacle barring the way to a rapid recovery of the ground lost by Western business interests in 1893.

The Fair Buildings Will Stand.

The World's Fair buildings at Chicago will not be torn down and removed as summarily as has been expected. The exposition authorities have made an agreement with the Park Commissioners, controlling Jackson Park, in which the fair was located, by which the latter release the former from all obligation to restore the park to its original condition. The exposition directory will pay the Park Commissioners $200,000 for the release and relinquish possession of the park on January 1. State buildings are, of course, not included in the transfer of property to the Park Commissioners, but all the great and small structures erected by the Exposition Company are transferred, including the Administration Building, Machinery Hall, Mines and Mining Building, the Terminal Depot, the Electricity, Liberal Arts, and Agriculture buildings; the peristyle and its annexes of the Casino and Music Hall, forming the great court of honor, which in architectural effect has never been equaled; the Transportation, Horticulture, Fisheries and Anthropological buildings; the Art Gallery, the Convent of La Rabida, the Shoe and Leather Building, Stock Pavilion, barns, band stands and pagodas. If any salvage is realized from the sale of material in these buildings in the course of time it will now inure to the benefit of the Park Commissioners. They can take plenty of time for this work and can await a more propitious period in which to offer the several structures for sale. When the fair buildings were in process of erection the exposition management intimated that a good round sum would be realized from salvage, but that hope was abandoned long since, and it was deemed inevitable that heavy loss would be incurred if the buildings were torn down during the coming year and the park restored to its old condition. In the contract just made there is a stipulation that the city of Chicago may be permitted to remove the Manufactures and Liberal Arts Building, if arrangements are made for its re-erection elsewhere.

A writer in *Le Génie Civile* shows that there is a difference in electric potential between the water and gas pipes in all houses, and that if one terminal of a telephone wire is joined to the water pipe, on lightly touching the gas pipe with the other a crackling sound will be heard in the telephone, indicating the passage of a current. When the telephone is replaced by the galvanometer the negative pole is found to be formed by the gas pipe, and the galvanometer deflection to be permanent and constant in amount during several months, with a slight daily variation. The currents are attributed to slow chemical changes. With the currents developed in these pipes the writer succeeded in carrying on conversation between two houses more than 100 yards apart.

Management of Men and Workshops.

THIRD PAPER.

General and Detail Duties in Conducting Manufacture.

BY THOS. D. WEST.

In conducting manufacture with concerns requiring a general manager with superintendents or assistants under him it often becomes a question with the former where his labors will end and the latters' commence. The division of official duties in any manufacturing concern is a very important element to properly adjust. The duties of each should be so clearly defined that should anything go wrong with work as it progressed, or the finished product be found at fault the hand of the general manager could at once be laid upon the assistant responsible.

To insure perfection in any line of manufacture this point must be rigidly enforced. The line must be drawn so fine that no possible doubt as to the one responsible should exist, for if for a moment an opening is left for one head of a department to wedge in upon another and by interference and conflict of authority cause confusion, just so soon may ill results be expected.

It is the general manager's duty to plan and set off in sections or departments the manufacture of the firm's product so that as it progresses it will be under the charge of men who are fully qualified to watch and govern every detail in the process of its manufacture.

The detail work for any line of manufacture is more or less a factor that must be closely watched to accomplich success. The superintendent or assistant can in most cases be an incessant worker, and then, with all his efforts, he may often find that things go wrong and mistakes are made. It is not necessary, in order to exhibit interest and press forward work to the most successful end, that he should run around browbeating and asserting his authority at every opportunity. Some of the most successful superintendents and assistants to be found are men who, when seen at their posts of duty, are often judged of by observers as "figure heads," men having "a soft snap;" paid a big salary for doing nothing. Little conception such critics have of the hard, tedious, exacting labor such men are often performing. They seem to think their labors should be exhibited by an herculean effort of the arms and legs, interspersed with occasional opening of a volcano trap to belch forth terrifying sounds. The quiet, unostentatious superintendent, or "figure head," as some would call him, well knows that to achieve success in the performance of his duty it is brains and not bluster that must be used, and the main secret is in giving strict attention to details. He may be required to use his legs some, but at the end of the day's labors his brains will require by far the most rest. The detail work a superintendent or assistant may do is not all conceivable to any mind other than his own. It is only the workman's physical efforts that are tangible to conception by all, and each are as distinct in their function of exhibiting labor as it is possible for mental and physical efforts to be.

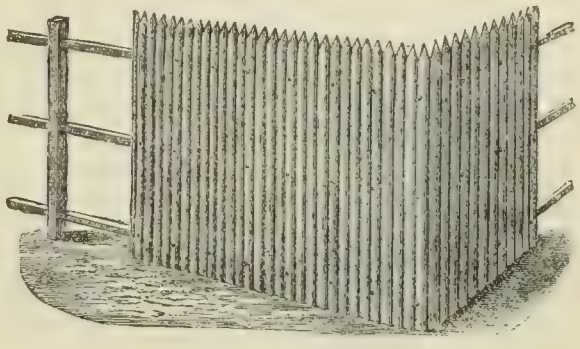
The daily details demanding attention may consist in deep thinking, designing, in directing, in inspecting and in educating or disciplining men. Altogether there may be hundreds of little things requiring study and concentration of the mind to insure desired results. They are a load which will not permit of rest in study or watchfulness. Its weight cannot be shaken off, sitting or standing. The mind must be impregnated with them so firmly that not a single item can escape having attention or be forgotten. The superintendent or assistant must know to the minute when his attention will be necessary to catch and correct errors in the manipulation of work which, from forethought, he conceives likely to occur. He will foresee and prevent accidents. The expected and the unexpected he will ever be on the alert for. Every person under his supervision is as easily controlled as the fingers of his hands. At any moment he knows what any individual should be doing. You cannot ask him a question that would betray ignorance of the doings of any man under his charge, or what is going on in his department. Surely such accomplishments are entitled to be credited as being no "soft snap." To be a good man for watching details is a very valuable quality to possess. It is equal to having power to design, to instruct, to dispatch work and get the best results out of men.

A man having all the above qualities combined is a very valuable superintendent or assistant. Too often are some of these qualities found very weak or entirely lacking. It greatly lessens a man's value if by keen thought and watchfulness he discovers details going wrong but lacks the force of character to properly oversee, reprimand and compel the wrongs to be righted.

The close watching of details in every manufacturing establishment by superintendent and assistants is akin in many respects to the duty of a general manager or president, the difference being that what he would lack in numbers would be more than made up by their importance and weight. Should one be neglected there is a chance of it bringing disaster or ruin to the establishment. With him lies the responsibility of the financial success of the firm. He must plan and study to obtain work, and then do the same to have it pass through the hands of his assistants in a manner to insure perfection in manufacture. He must be in touch with the outer world and know all that is going on, especially in his own line. If other competitors are able to undersell his firm, he must endeavor to make changes in his mode of manufacture that will admit of competition with a profit. All superintendents and assistants look to him for instruction and advice in all important transactions of their respective departments, and in all that is great and masterly concerning the establishment. He is the first to decree what shall be done, and is responsible for its enactment. Be he assistant, superintendent or general manager, he will find it is the little details of his duties that give him the most labor, and to insure success they must be as closely watched and attended to as the large and important ones.

Corrugated Fencing.

The engraving given herewith shows an application of corrugated galvanized iron, which is called in England "unclimable fencing." The engraving is from Frederick Braby & Co., 352 to 362 Euston Road, London, England. The fence is the ordinary galvanized iron, with one edge spiked, arranged to be set up on rails like a picket fence. It is made in all gauges, from 18 to 26 and from 2 to 10 feet in hight. It is fastened in place with cone head screws or nails with washers, and ranges in price in England from 20 cents to $1.40 per running foot, according to the hight and thickness.



Corrugated Fencing.

The regular monthly meeting of the Western Foundrymen's Association will be held on Wednesday, December 20, at 7.30 p.m., in rooms 702 and 703 Temple Court Building, corner of Dearborn and Quincy streets, Chicago. Hon. E. A. Wheeler of Sharon, Pa., will read an interesting paper on "Furnace *vs.* Foundry Practice." An amendment to the by-laws governing propositions for membership will be acted on. Secretary B. M. Gardner, 1437 Monadnock Block, Chicago, earnestly invites all foundrymen to be present, whether members or not, and to take part in the discussion.

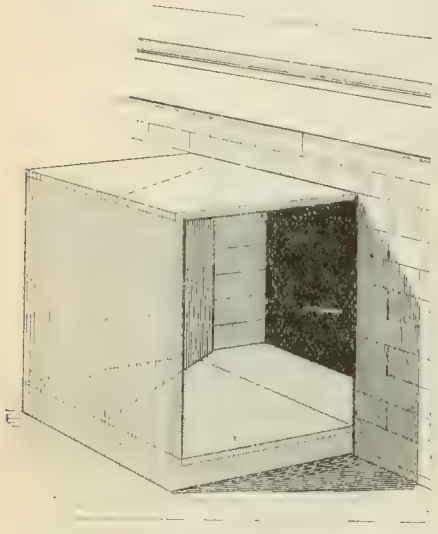
A dispatch from Williamsport, Pa., asserts that the anarchist, Auguste Vaillant, who has gained world-wide notoriety by his bomb throwing outrage in the French Chamber of Deputies, was a resident of that town last year. He was employed as a frescoer and galvanizer at the Backus Heater Works and is described as a rabid anarchist of a blood-thirsty type.

Walter Sellers of the Committee on Manual Training of the Board of Public Instruction of Camden, N. J., received word from the World's Fair Commissioners recently that three prizes had been awarded the exhibit sent from the Camden Manual Training School. The prizes were given in mechanical drawing, wood working and iron forging.

THE LETTER BOX.

Furnace Heats the Cellar.

From B. REEZE, *Odessa.*—In *The Metal Worker* of November 18 "C. E." wants a remedy for a furnace that heats the cellar. A little study of the A B C of it will enable him to supply an effective remedy. The furnace proper is simply a partition between the heat and the air within the casing to prevent the air from absorbing disagreeable things along with the heat. The jacket of the



Furnace Heats the Cellar.—Fig. 1.—*General View of Entrance to Cold Air Supply.*

furnace is a cage to hold the air near the heated surface and to direct it to the pipes that lead to the heating flues. He describes a good jacket, and as his furnace heats the cellar through it, he must have a pretty good plant. The furnace being conceded good, the trouble is with the air. If plenty of air passed through the furnace rapidly, the air would take up the heat from the furnace and carry it where it was wanted. It would seem to be a clear case of

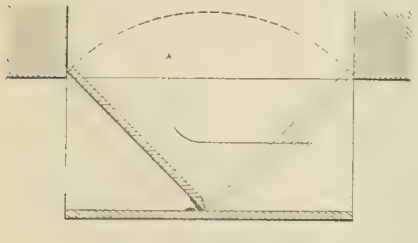


Fig. 2.—*Plan View.*

gasping for breath. If this is correct, open the window, give it air. If there is a cold air box, make it larger. It won't be a disadvantage to give it an area equal to the combined area of the pipes leading from the top of the furnace, for a damper placed in it will regulate the supply if it is attended to. It might be that the air goes right by your correspondent's cold air supply window. If it does, he must build a cover to this window, as shown in Fig. 1, projecting a foot or so, with only a top and a front to it, and hinged to the front there should be a door that will swing both ways and wide enough to strike the window on either side, as shown in Fig. 2. This will prevent the air passing and will insure the air entering the supply window no matter how it blows. A wire screen may be needed at each end to keep out leaves, &c. It may be that the furnace is "hide bound"—that is, the casing is too close to the interior parts. That is a constructive defect, but a greater air supply will help it. It is possible that the air that is heated cannot get out of the pipes because they are not properly connected with the heating flues, but more likely because the flues are too small and of improper shape. His remedy then is to put the registers in the floor downstairs and let the air through. To sum up, the fuel makes smoke and gas as well as heat. The furnace keeps the smoke and gas out of the air while it heats it. The air takes the heat and carries it off before it can heat the casing if there is provision for plenty of air to get in, get through and get out. If there are double sashes on the windows and no ventilating flues to let the air that is in the house get out and make room for warm air to get in, some outlet must be provided or air cannot get through the furnace to take away the heat of the fire.

Condensation in Chimney.

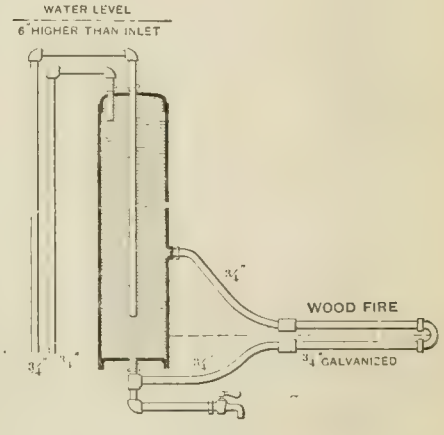
From C. S. S., *New Jersey.*—I would like to hear from the readers of *The Metal Worker* the cause and the remedy for black, sticky water running down a chimney that has a stone cap for several days succeeding a rain storm. The chimney has an old fashioned fire place and is about 2 feet square. No water can get in at the top.

Note.—The products of combustion, rising from any burning fuel, contain more or less vapor which condenses on coming in contact with a cold surface. The colder the chimney and the more smoke, &c., it receives, the greater will be the quantity of liquid condensed, even to the extent reported by our correspondent. The chimney in question is unusually large and would require a considerable fire to overcome the chilling effects of the atmosphere upon it in ordinary whether, while in rainy weather both it and the stone cap would naturally be kept at a low temperature. In rainy weather the smoke does not pass off freely, and the chimney being cold condensation is much more profuse. A remedy that has proved satisfactory in some cases is to run the stove pipe up inside of the chimney for several feet. The hot smoke pipe warms the chimney and delivers the smoke so high up that it passes off before the condensation takes place.

Is It Bad Circulation?

From L. P. F., *Fairfield, Vt.*—Please inform me through the Letter Box what causes bad circulation through the water front and boiler arranged as shown in the illustration. When the boiler was set the bottom of it had to be placed 4 inches below the water front so that the level of the water supply would be 6 inches higher than the inlet to the boiler. Water would not flow through the hot water pipe so I extended this pipe down 4 inches into the boiler, as shown; then a good flow of water was secured at the faucets. The water front is made of ¾-inch galvanized pipe, and is used in a wood stove.

Note.—There is nothing in the arrangement as shown that would interfere with circulation. The fact, however, that the level of the water supply is so little above the level of the boiler



Is It Bad Circulation?

inlet leads to the impression that the supply fails entirely at times, which would account for the water not flowing through the hot water pipe. It is not probable that any benefit is derived from extending the hot water pipe down into the boiler. In a wood fire a water front is exposed sometimes to an intense heat and again to a current of cold air, which would cause irregular circulation. If the loop end of such a water front was placed higher than the inlet and outlet end an accumulation of air or steam in it would make temporary trouble and noise, but any permanent trouble would be due to some more substantial obstruction in the pipes or connections.

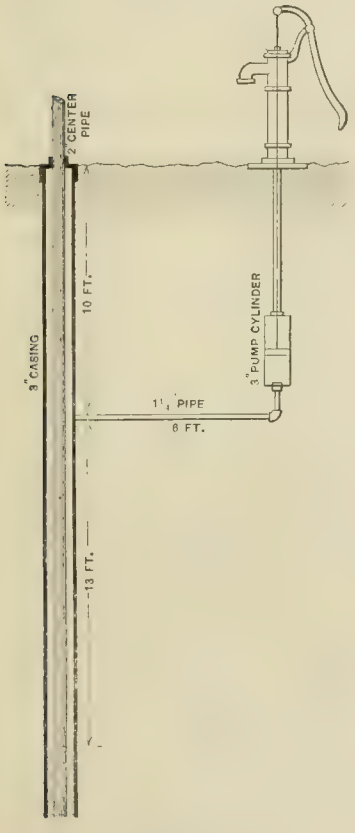
Two Chimneys For One Boiler.

From R. E. D.—Referring to remarks in *The Metal Worker* by your subscriber from Henryville, December 2, and by "F. L. W." of Plankington, November 18, would say, as I understand it, that "F. L. W." has con-

nected one fire to two chimney flues and he does not get good combustion. In an experience of many years I have never known one fire to burn well when connected to two flues, for the simple reason, as I understand it, that more heat passing up one flue causes a descending current in the other. If it was my job, and I wished to get the best possible result, I would make an easy connection to one flue and let the other stand idle.

Faulty Pump Suction.

From J. W. C., *Greenfield, Ind.*—I have a pump put on a well which draws water all right for a few strokes, then throws air. The pump suction, however, is air tight, so I am at a loss to account for the trouble. The piping



Faulty Pump Suction.

is set differently from anything I have ever seen. I inclose herewith a sketch. The water in the pipe is 23 feet below the surface of the ground.

Note.—The sketch which we have reproduced herewith shows a curious system of piping. We will be glad to have an expression of opinion on the cause of the failure of the pump. So far as we can interpret our correspondent's drawing, the 3-inch casing is plugged at the top with a 2-inch center pipe running down through it. The pump suction, however, comes in at the side of the casing 10 feet below the ground and 13 feet above the level of the water. It might be that with a 3-inch pump cylinder it would not take long to exhaust the water from the well below the limit of suction—that is, provided it did not run in again very fast; or it is possible that the center 2-inch pipe extends so short a distance below the surface of the water that when the air is exhausted in the pump cylinder it makes air bubble through from the inside pipe instead of raising the water to the cylinder. We doubt, however, if either of these are the correct explanations, as our correspondent is presumably familiar with pump work, and these causes of trouble would have occurred to him.

Steam Return to Top of Boiler.

From E. A. B., *Concordia, Kan.*—We are called upon to remedy a defect in a steam heating plant and would like the opinion of *The Metal Worker* on the change we propose to make. A manifold radiator is placed on the floor above a boiler that carries 60 pounds of steam and both pipes from the radiator connect with the boiler at the top. We intend to take the return from the radiator from the top of the boiler and connect it with the feed water supply to the boiler. Our customer thinks this change will make no improvement and that the job will still fail to heat satisfactorily.

Answer.—The change suggested will be all that is required to let the steam pass freely through the radiator and the pressure will aid rather than hinder the circulation, which is all that is required to heat the radiator thoroughly.

A Question of Pump Lift.

From J R., *Brooklyn.* — Will *The Metal Worker* please tell me how high a pump will lift water and the method of finding it?

Answer. — Theoretically, a pump should lift water to a hight of 34 feet, which is the hight of a column of water that will balance the weight of the atmosphere at the sea level. Practically a pump is doing good work if it lifts water 28 feet. Sometimes a lift of 30 feet is made, but, as a rule, a lift of over 25 feet is not attended with satisfactory results. The action of a pump is to create a vacuum, and the atmospheric pressure, which is 14.7 pounds to the square inch on the water to be raised, forces it to follow up the vacuum.

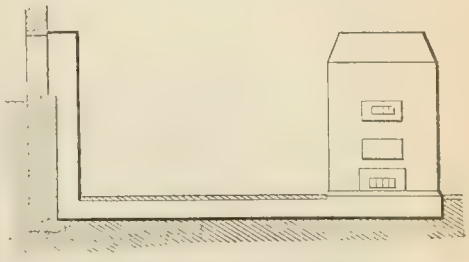
Remedy Wanted for Poor Draft.

From E. O. H., *Rock Valley, Iowa.*—Please give in *The Metal Worker* a remedy for a poor draft in a steam heating plant. The boiler is 10 feet long and has 18 tubes 3 inches in diameter. It is set in brick, with a half arch front, and is connected with a chimney that is 40 feet high. The chimney has two flues in it, each 16 inches square, that run clear to the top. A 16-inch round sheet iron smoke pipe runs 9 feet from the boiler to chimney, with a rise of 4 inches. The chimney is almost directly in front of the boiler.

Note.—From the fact that there are two flues in the chimney, a leakage between them may supply the capacity of the warm flue without the fire being benefited. If the brick work about the boiler has settled cracks may let in air with the same effect. Investigation will enable such trouble to be stopped if found. Our readers are invited to express their views on this subject.

Angles in Cold Air Boxes.

From J. B. W., *Lexington, Ky.*—The accompanying sketches represent two forms of cold air boxes for heating furnaces. In Fig. 1 the cold air box is arranged in such a manner that the bends are right angles. I have never observed that hot air would come out of



Angles in Cold Air Boxes.—Fig. 1.—Bends in Cold Air Box Made at Right Angles.

the outer opening of a cold air box when the bends were right angles, as shown in Fig. 1. On the contrary, when the bends are made angling, as shown in Fig. 2, in each instance I have noticed the hot air would come out of the cold air opening. Have any of the readers of *The Metal Worker* had a similar experience, and if so, what explanation can be given for a cold air

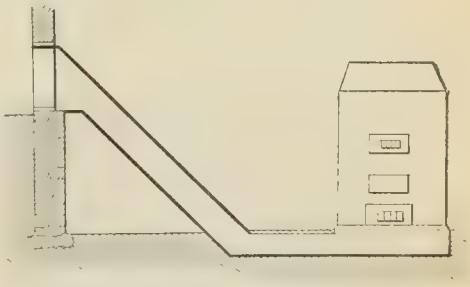


Fig. 2.—Bends in Cold Air Box Made Angling.

box constructed as shown in Fig. 1 operating in a more satisfactory manner than the one shown in Fig. 2?

Heating Bathroom from Kitchen Boiler.

From I. W. B. & S., *Gananoque, Ont.*—We are about fitting up a bathroom in our own house and would like some assistance. The main trouble is to heat the bathroom, as it is in a wing not heated by the furnace. The room is directly over the range and boiler in the kitchen beneath, and is 6 x 8 feet, with a ceiling 8 feet high. Cold water is supplied from a tank in the garret over the bathroom. We would also like some information on connecting hot and cold supply to bath and basin. We have done considerable iron pipe work, but have never fitted up a bathroom.

Answer.—The plan submitted by "R. J. M." in *The Metal Worker*, December 9, is a very good one, when all the details are correctly arranged. Other information on the same subject can be found in the Letter Box, October 7, September 30, September 9 and August 5. From reading these articles our correspondent can get information on all of the points he mentions.

PLUMBING and GAS FITTING.

Some Experiments on the Effect of Water Hammer.

The disastrous results that sometimes follow repeated water hammer in the case of house plumbing are well known, and several expedients are adopted for preventing it. The air chamber is the commonest means, but as air chambers become filled with water, devices have been introduced making use of rubber balls that would prevent the entire filling of the chamber with water. In view of the practical bearing of this subject, the paper presented at the last meeting of the American Society of Mechanical Engineers by Prof. R. C. Carpenter of Sibley College, Ithaca, N. Y., is more than usually interesting. Professor Carpenter is well known to many of our readers, having carried on experiments relating to radiators and other practical affairs. In the present investigation he was assisted by S. H. Barraclough and A. W. Wigglesworth, graduates of Sibley College.

The first set of experiments was made with a water hammer produced in a pipe 1½ inches in diameter by the sudden closing of an ordinary self-closing basin faucet, the pressures being taken by a Crosby indicator. The normal pressure in the pipe was 30 pounds per square inch. In the paper presented by Professor Carpenter are diagrams showing the variations in the pressures as recorded by the indicator for the experiments made under different conditions. In the first experiments there was an air chamber on the main some distance from the tap. This was afterward removed, and experiments were also made with the chamber filled with water. The result was that the smoothest curve and that showing least maximum pressure appears when the air chamber is used, while the most irregular card is produced by removing the chamber altogether. Filling it with water gave an effect intermediate between the other two. The vibrations after the initial shock were clearly shown in the indicator cards. The following table from Professor Carpenter's paper gives, essentially, the average pressures:

Tests were made with velocities varying from 3 to 9 feet per second, and under the following conditions:

1. With no air chamber on the pipe at all.
2. With an air chamber, capacity 320 cubic inches.
3. With an air chamber, capacity 40 cubic inches.
4. With a water chamber, capacity 320 cubic inches.

The result of the second series of tests is given in the following table:

Log and Results of Tests.

Water chamber.		No air chamber.		Small air chamber.		Large air chamber.	
Velocity.	Pressure.	Velocity.	Pressure.	Velocity.	Pressure.	Velocity.	Pressure.
3.92	152	2 92	98	3.92	94	3.70	50
5.23	203	3 15	111.5	4.62	112	4.42	56
6 00	230	3.35	122	5 57	128	5 02	66
6.65	242	3.80	117	5.82	141	5.45	78
6.65	256	3 97	136	6.46	164	6.02	85
7.17	271	4 02	141	6.92	188	6.62	90
7.37	29.	4.20	145	7.42	208	7.02	97
7.47	294	4.25	145	7.80	242	7.25	103
7.85	295	4 52	161	8.26	249	7.73	104
8 25	304	4.62	164	.....	.....	8.07	122
8.52	315	5 05	175	.....	.....	8.18	120
....	....	5.22	197	....	.	8.45	120
...	....	5.57	180	.....	.. ..	.. ..	.....
..	....	5.77	248		. .	....	..
.	....	6.02	230	.....	.....	....	.. ..
..	....	6.02	230	.....	.....	.. ..	... ..
...	....	6 52	244	.....	.....	.	.. ..
...		6.87	271	.....	.....	.. ..	.....
....		6.93	256	.....	.....	.....	.....
....	..	7 07	266	...	...	.....	.. .
...	..	7 13	272	...	.....	.....	.....
. .	....	7.25	281	.....	.....	.....	.....
....	....	7.52	291	....	.. ..	.....	.. ..
...	....	7.57	307		.....	.....	.....
....	....	7.70	309	.....	.....	... ..	.....
..	....	7.75	305	.....	.....	.. ..	.. ..
....	....	7.90	305	. ..	.....	.....	.....
....	...	7.87	294	. ..	.. ..	.....	.....
..	....	8.27	291	... ..	.. ..	.. ..	.....
...	..	8 35	270	..	.....	.....	..
. ..	....	8.55	270	.. ..	.. ..	.....	.....
..	...	8 55	277	.....	.. ..	.....	.....
..	. .	8.45	286	..	.....	.....	.....
..		8.60	289	.....	.....	.. ..	.....

In closing his paper Professor Carpenter says: "The present set of experiments does not pretend to have demonstrated any new principle, but, as was stated at the beginning, the amount of experimental work done on the subject is very meager, and these results may be of assistance to any one intending to investigate the subject more thoroughly; while they also may be of service to the hydraulic engineer, as showing the maximum possible pressure which can be produced by water ram, under circumstances similar to those surrounding this series of tests."

	Air chamber.		No air chamber.	Air chamber filled with water.
Static pressure..	29.5	28 5	27.5	28
No. of distinct blows.....	8	8	9	9
Maximum pressure	72.5	61.5	69.0	76.0
Minimum pressure.....	2 5	10	16	9
Time pulsations continue..	0.8 sec.	0.8 sec.	over 1 sec.	1.1 sec.
Pressure at end of one second...	36	34.5	36	36
Ratio of increase of pressure....	2.47	2.15	2.56	2.70

The tests above mentioned, though interesting, were not considered satisfactory, owing to the low velocity of the water in the main, the area of which was large compared with the size of the orifice. A new set of experiments was undertaken, therefore, in which the hammer was produced by suddenly closing a gate valve across the full section of a 2-inch water main. This gave much higher velocities than in the previous case, and showed more accurately the conditions prevailing in actual practice with water mains.

Domestic Electrical Work.—IV.*

By W. A. W.

FIRE ALARMS.

Another important use to which electric bells are well adapted is for fire alarm work. There are many large factory and other buildings in towns where watchmen are on duty at night that should be provided with some rapid means of communicating a warning of fire from different points in the building. In cities where the electric telegraph fire alarm system is used it is customary to place an alarm box near such buildings, but it is obvious, particularly in the case of high buildings, that in case the janitor or watchman discovers a fire in a remote part of the building valuable time must be lost in reaching the box and turning in a regular alarm, whereas if the building were provided with a private alarm, with numerous push buttons placed in the most accessible places, it would take but a moment's time to notify the fire department, and the time thus gained, together with the fact that the person giving the alarm could at once give his whole attention to extinguishing the fire, might avert a disastrous conflagration.

In installing a private fire alarm system only one wire is necessary between the building and engine house, the ground being used as a return. In advocating the use of the ground as a return, the writer does not wish to be understood as favoring this method over an all metallic circuit, for nearly all that is saved in wire must be made up by additional battery power to work a line of this kind satisfactorily. But experience has demonstrated that where a metallic circuit is used out of doors, especially when both wires are run on the same poles close together, the mischievous instinct of Young America will sometimes prompt them to throw pieces of light chain or fine wire over them, which, coming in contact with both wires, closes the circuit and gives a false alarm. Again, where wires run through trees the swaying of the branches may crowd them together and close the circuit, and these annoyances often are the cause of an otherwise valuable system being condemned as being more of a nuisance than a safeguard. In using the ground circuit these annoyances are avoided. The ends of the circuit should, however, if possible, be soldered to a gas or water pipe, which always makes the best ground connection. If these are not to be had an iron rod eight or ten feet long should be driven into the ground so as to be certain of a moist earth connection at all times.

Fig. 9 is a diagram of private fire alarm with ground return. P P P are the pushes in building, G the ground connections at either end of the circuit and B the bell at engine house. In Fig. 10 is illustrated a simple button three-line return call, with one set of battery, the bells to ring separately. Fig. 11 shows the use of the return call button. This makes the cheapest and at the same time a perfect

* Copyrighted, 1893, by David Williams.

return call system. This button has three connecting points and should be so connected that the line through the bells will be continous with the batteries left out of the circuit. By pressing the button the upper contact will be broken, while the lower will be closed, thus throwing the local bell out and the local battery into circuit, causing the bell at the other end of the line to ring. When the button is released the circuit on the local bell is closed, leaving it in position to be rung from the other end of the line.

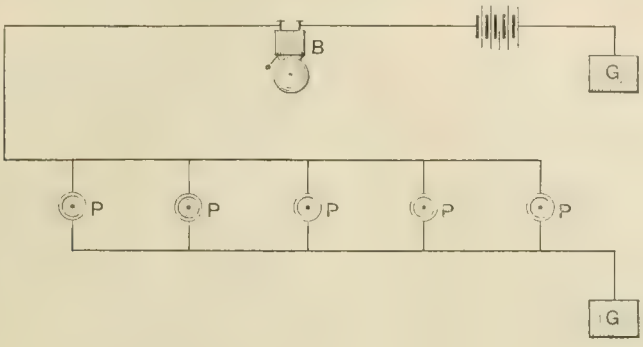


Fig. 9.—Diagram of Private Fire Alarm Circuit.

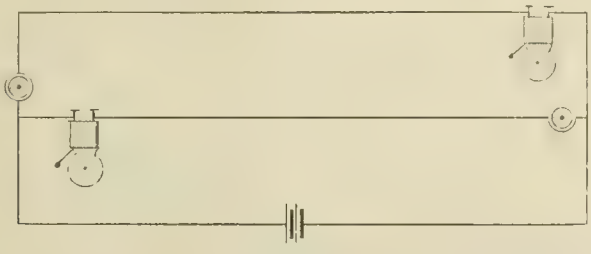


Fig. 10.—Simple Button Three-Line Return Call.

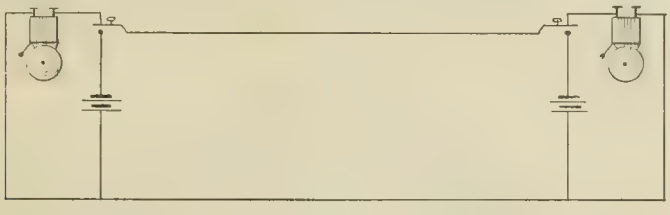


Fig. 11.—Two-Line Return Call with Return Call Button.

Plumbing Inspection Beneficial.

In a recent number of the *Canadian Architect* appears the following enumeration of the benefits that have been experienced as a result of inspecting plumbing work:

The by-law adopted by the City Council of Toronto some four years ago making compulsory the inspection by the city officials of all plumbing and drainage work, as well as alterations in existing work done in the municipality, is unquestionably one of the most valuable pieces of civic legislation that has marked the history of the city. Previous to the passing of this by-law the plumbing and drainage work throughout the city, even in the most expensive residences, was often done in a disgraceful manner, and in such a way as to prove injurious to the health of the occupants of the house. It was not unusual for drains to be laid without joints of any kind being made and in this condition covered up with earth and concrete, the character of the work being revealed when sickness entered the house. Under the present system work of this kind is no longer possible; the owner or his architect can demand from those who are to do the work a certificate from the plumbing inspection department that everything has been done in accordance with the provisions of the plumbing by-law, and unless the work has been done in this manner the department will not issue a certificate, and the owner may refuse payment. Another valuable feature of the by-law is that plans for the plumbing and drainage work must be filed with the plumbing department, so that in the event of defects developing in the work in the future the exact location of the pipes is ascertainable. A great deal of difficulty is often experienced in cases where alterations are required to work done previous to the passing of the by-law, as in such cases much trouble and expense is often necessary to discover the location of the drains.

TRAPS AND VENTS.

A NEW PLUMBING FIRM, at Jamestown, N. Y., is composed of Charles T. Taylor and Fred. Underwood, who will be found in the new Frederick Block, 110 East Second street. Both are young men, well and favorably known, and learned their trade in that city.

PRESIDENT EYANSON AND SECRETARY CLARK of the Philadelphia Master Plumbers' Association appeared before the City Council's Committee on Highways last Monday night in opposition to the ordinance requiring contractors and others who intend opening paved streets to deposit an amount equal to twice the cost of repairing the street as security, to be returned at the end of two years. The result is, the ordinance was referred to the Director of Public Works, the Chief of the Bureau of Highways and a committee from the Master Plumbers' Association, who will eliminate its objectionable features.

THE INSPECTOR of plumbing and sewers of Seattle, Wash., makes his report for the month of November as follows: Plumbing plans filed, 26; first inspections, 28; final inspections, 36; sewer permits issued, 5; houses connected with sewer, 7; sewers inspected, 16.

A NEW PLUMBING LAW to improve the sanitary condition of houses was recently submitted to the City Council of Meriden, Conn., by the local association of plumbers, steam and gas fitters. It was favorably received and referred to the Committee on By-Laws.

UNDER the management of the health office the City of Washington, D. C., has been placed in an excellent sanitary condition. Through the means afforded by an emergency fund of $24,000 appropriated by the last Congress a force of temporary inspectors was appointed, by whose agency a thorough and complete house-to-house inspection of the entire city and county has been made.

LOCAL UNION 2 of New York City of the United Association of Journeymen Plumbers, Gas Fitters, Steam Fitters and Steam Fitters' Helpers has elected five delegates to the convention of the State Union in Utica, the second week in January.

W. P. KENNEDY has moved his plumbing shop to 95 Bank street, Bridgeport, Conn.

THE JOURNEYMEN PLUMBERS' UNION recently petitioned the city council of Dubuque, Iowa, to adopt a system regulating the plumbing throughout the entire city and to appoint an inspector of plumbing to inspect all work done by licensed plumbers and who will see that the work is done in accordance to the system to be established by the city.

IN RESPONSE to a growing interest in high grade plumbing fixtures, Harry McQuade of Chattanooga, Tenn., who has been identified with the trade for 25 years, makes a display of fine goods at his store at Seventh and Cherry streets. He has recently received a large shipment of water closets, lavatories, enameled bathtubs and sinks from the J. L. Mott Iron Works of New York and the L. Wolff Mfg. Company, Chicago, and will make a specialty of these lines in future. He is agent for the Morgan filter, which is attached to the service pipe, several of which he has set with excellent results.

EUGENE LEIGHTON, formerly of the hardware firm of Arthur & Leighton and later in the plumbing trade, has again entered the business ranks of Fort Dodge, Ia. He occupies the rear of J. W. Ryan's hardware store, where he carries a full line.

C. S. BLAISDELL, York Corners, Maine, has contracted for the erection of an addition to his store, to be used as a plumbing shop.

AT THE CONVENTION OF DELEGATES of all the plumbers, steam fitters and gas fitters' helpers, recently held in New Haven with Union No. 21, to effect a State organization, the following State officers were elected: President, Thomas F. Bulger of Union 22 of Waterbury; secretary and treasurer, James Coyle of Union 21 of New Haven.

AN ASSOCIATION OF MASTER PLUMBERS has recently been organized in Cambridge, Mass., with the following officers: President, A. Baumeister; vice-president, Geo V. Eldridge; secretary, James A. Reid; treasurer, E. W. Clark. The object of the association is to secure better protection for the plumbers and proper enforcement of the plumbing laws.

PRESIDENT FINNERTY of the National Association of Master Plumbers is corresponding with the master plumbers of Long Island City, urging them to form a local association and establish uniform prices, which have been much demoralized.

PREPARATION is being made at Waltham, Mass., for the annual examination and registration of plumbers.

AN ORDINANCE providing for the creation of the office of plumbing inspector is under consideration by the authorities of Omaha, Neb. It provides that the inspector shall have a salary of $1500 per annum and that he shall have an assistant, who shall receive $100 per month. By the terms of the ordinance the plumbing department is divorced from the office of Superintendent of Buildings, and is made a separate department by itself.

CLERK BELKNAP of Rochester, N. Y., is now prepared to renew the plumbers' licenses. The State law provides that all certificates of registration expire Decemeer 31 of each year and must be annually renewed within thirty days preceding January 1 by all who remain in the business.

A World's Fair Story.

(From a Correspondent.)

Respectfully dedicated to the ——— Sanitary Company.

SCENE—Jackson Park, 1893.

DRAMATIS PERSONÆ.

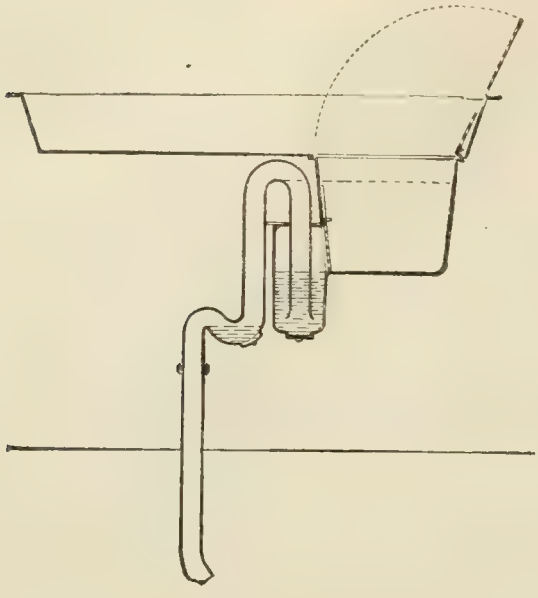
A Peekskill Military Academy School Boy (in uniform).
Some Citizens—of female sex—from "'Wayback."

Citizens (to Boy): "Say, can you tell us where we can wash our hands? Them basins in there has all got holes in 'em." [*Boy expires.*

What did the sanitary company do?

Sanitas Kitchen Sinks and Flushing Pots.

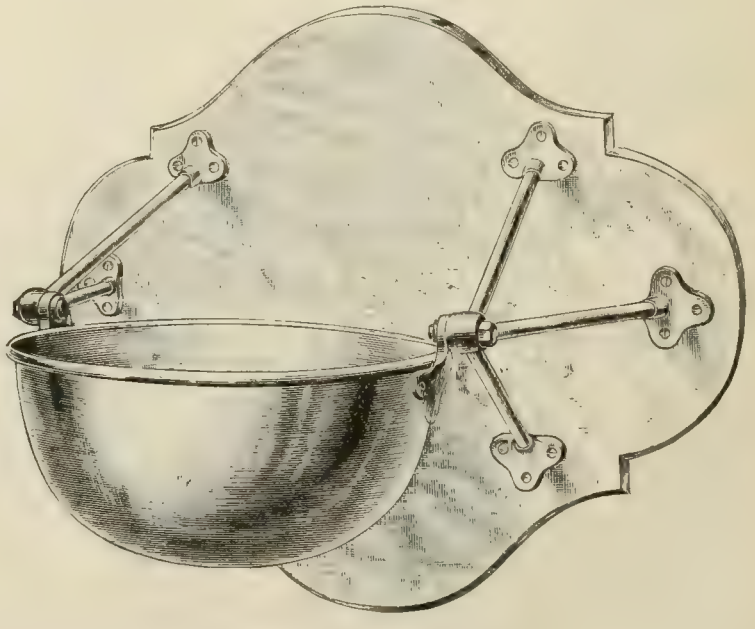
The accompanying cut shows the Sanitas kitchen sink and flushing pot made by the Smith & Anthony Company, Boston, Mass. A sectional view has been selected that the operation might be readily understood. The flush pot is so made that it can be used in connection with stone or other sinks as well as with a cast iron sink, as shown. In the bottom of the sink is a large opening covered by a hinged strainer. Beneath this the flush pot is fastened with a water tight connection. At one side of the flush pot, with a strainer that raises in a slot between them, is a trap of the Sanitas character, from the top of which the usual waste pipe runs and is trapped. This construction allows the accumulation of water until the solid matter is deposited and the grease has hardened on the top of the water. Then as the water rises to the syphon overflow the manufacturers say that a sudden addition of a few pints of water will start a syphonic action that will cause a rapid discharge of the contents of the flush pot, filling the full bore of the pipe and effecting a thorough scouring. The strainers prevent the escape of refuse to clog the pipes, and being movable give free access to all parts, relieving the task of cleaning from the objections that usually cause the work to be neglected.



Sanitas Kitchen Sink and Flushing Pot.

Tilting Wash Basin.

Pittsburgh Brass Company, Pittsburgh, Pa., and 36 Park place, New York, manufacturers of plumbers' supplies and specialties, are introducing a novel tilting wash basin, as here illustrated. It is designed largely for Turkish bathrooms, gymnasium baths and general athletic uses. The cut shows it so well that but little need be added except that it is made of extra heavy brass metal and nickel plated.



Nickeled Tilting Wash Basin.

THE PLUMBING SHOP of McGerey, Felthousen & Co., Buffalo, N. Y., was one of the sufferers in the great fire which broke out in that city on December 14. Their estimated loss is $10,000. The conflagration was caused by an explosion of natural gas, and a whole block of buildings was consumed.

NEW PUBLICATIONS.

HINTS TO PLUMBERS ON JOINT WIPING, PIPE BENDING AND LEAD BURNING. By John W. Hart. R.P.C. 1893. 311 pages. Illustrated. 6 x 9 inches in size. Published by Smith, Greenwood & Co., 19 Ludgate Hill, London, England. Price, $2.

The author is an associate of the Sanitary Institute and has received first honor medals for practical and technical work, and is instructor and lecturer at Goldsmith's Institute and Croydon County Polytechnic. The book contains 311 pages, including a well arranged index, and 184 illustrations. The preface states that it is not intended to be an exhaustive work and that some difference of opinion may exist on the "Hints" given. The introductory notes the advance made in plumbing in the last decade and points out that in spite of the discouragement met, most of the improvements have been suggested by the plumber. The

first 100 pages of the book are devoted to bending lead pipe, more particularly lead soil pipe and square pipe, such as is used for rain conductors. The main portion of the book is devoted to making different kinds of joints, underhand, upright and branch joints, on both service and soil pipes. One of the features of the suggestions on joint wiping is the recommendation that an iron be used, and that irons could be more generally used with benefit. Care in preparing the joint previous to any attempt to make it, is strongly recommended. Many different methods are shown for securing the pipe on which the joint is to be made for use in the shop or at a building. No elaborete attempt is made to explain the method of wiping a joint, which is said to be best learned only by continued practice, observing some general rules.

The last chapter is devoted to autogenous soldering or lead burning, opening with the following: "Although the art of lead burning has for many years been kept quite distinct from plumbing generally, it is, nevertheless, essentially a branch of the trade, and one in which a large number of plumbers are becoming quite proficient, not that there is required a large amount of skill or ingenuity in the execution of lead burning, because, as a matter of fact, when it is compared with first-class plumbing it is not nearly so difficult to acquire." This is followed by a description of the hydrogen machine generally used, and a method of using the ordinary illuminating gas, always readily secured, and with which good work can be done. Much in the book is interesting as showing the difference between English and American practice, and many of the "Hints" are instructive, particularly to the younger members of the craft.

HEATING AND PLUMBING.

NEW WORK AND CONTRACTS.

THE CANFIELD STOVE COMPANY of Rondout, N. Y., have recently installed Richmond heaters in the residences of H. Denny, J. B. Gallagher, Charles Bishop, M. Newcomb, W. J. Quick, Livingstone street church parsonage and the Rondout Club building, as well as the residences of W. C. Harris, at Acord, N. Y., and D. N. Matthews, at Shoken, N. Y.

LEIGHTON, DAVENPORT & Co., Bangor, Maine, who are agents for the Richmond boilers, have recently installed them in the residences of E. V. Merrill and N. R. Hopkins.

JAMES F. PEAVEY, Somersworth, N. H., is making arragements to have his shop heated by the Gurney hot water system.

FARRELL & CONSTON bid $499 and secured the contract for doing the plumbing work in the Chelmsford street schoolhouse, at Lowell, Mass.

HOWELL, SHANKLIN & DOWMAN, Charleston, W. Va., have been employed to remove all the water closets in the West Virginia Hospital for the Insane, at Weston, and replace them with modern closets and to improve the sanitary fixtures generally.

W. J. BURROUGHS, plumber, steam and gas fitter, Queen street west, Toronto, has been awarded the contract to place the steam, gas and plumbing fittings in the St. Lawrence branch of the Bank of Commerce, which is being built at the corner of King and Jarvis streets, Toronto.

P. J. MONTAGUE of the firm of Montague & Lewis, plumbers, of Knoxville, Tenn., is at Decatur, Ala., attending the contract which the firm has for the plumbing and steam fitting in the new court house nearing completion.

JAMES DONOVAN, Middletown, Conn., is heating the McDonough House and using Exeter ornamental steam radiators.

THE CONTRACT for putting in a water supply at the Benton School, at St. Louis, Mo., has been awarded to Ring & Reardon at $394, it being the lowest bid. The same firm bid lowest on the plumbing contract at the Washington School and were awarded the job.

THE CONTRACT for furnishing lavatories and plumbing fixtures at the Irving School, at St. Louis, Mo., has been awarded to M. Taaffe, the lowest bidder, at $953.

ALLEN & WARD, Athol, Mass., will put a steam heating apparatus into Emory Gage's new South Main street residence.

W. H. BUCKLEY & Co. have the contract for putting a steam heating apparatus into the new Hayward Block, at Burlington, Vt.

PAGE & SPEARING of Guilford, Maine, have received the contract to put a steam heating apparatus in the new schoolhouse at Milo.

AMONG THE CONTRACTS recently taken by the Samuel I. Pope Company, 360–364 Dearborn street, Chicago, can be mentioned the following: Steam heating plant for the Grand Trunk freight depot, Third avenue; for the Dental College of the Northwestern University, Dearborn street, near Twenty-fourth, steam heating apparatus; heating and ventilating plant for the Orington Lunt Library, Northwestern University; for the Quartermaster's Department, Fort Sheridan, Ill., change in ventilating system in cavalry and infantry barracks. Amount of contract, $4,469.

WILLIAM M. HALL, North Attleboro, Mass., is putting in a plant for the heating of A. S. Bishop's big furniture store and workshops by both steam and hot water systems.

TREHER & KNOTT, Gloversville, N. Y., have the contract to heat the German Catholic parsonage with a No. 6 Volunteer heater.

E. RUTZLER, 178 Centre street, New York, president of the National Association of Master Steam Fitters, is installing steam heating plants in the Cornell building, at Twenty-fifth street and Thirteenth avenue, and in Sire's Hotel, at Broadway and Forty-first street, New York. In the hotel he is using a Worthington horizontal tubular boiler. In Brooklyn he is installing the heating apparatus in the Bijou Theater, and has recently heated the armory buildings of both the Thirteenth and Twenty-third regiments of the National Guard.

THE ABINGDON HOUSE, at Providence, R. I., is being heated by H. T. Root & Son of that city, who also have heated the residence of the Rev. Father Creeden, Moosup, Conn., using Rich mond boilers.

J. V. MULVEY, Woonsocket, R. I., has recently placed a Victor steam heater in the Fairmount school house in that city.

GEORGE B. COBB & Co., 42 Duane street, New York, are engaged in erecting a steam heating plant in the Brock House at Enterprise, Fla., using a No. 125 Florida soft coal steam heater and 715 feet of Bundy Elite radiators.

E. P. YOUNG of 28 North Sixth street, Philadelphia, is doing the plumbing in the recent addition to the Rittenhouse hotel, Twenty-second and Chestnut streets, Philadelphia.

EDWARD S. HANKS has opened a plumbing shop at 58 Harrison avenue, Springfield, Mass.

JACOB DE KAM bid $575 and secured the contract for placing water closets in the Woodward avenue and Lovell street schools, at Kalamazoo, Mich.

THE WELLS & NEWTON COMPANY, 1108 and 1109 Monadnock Block, Chicago, have the contract for steam heating and plumbing in the Carter H. Harrison public bathrooms, 192 Madison street; also steam heating plant in the Tudor Apartment Building, Forty-third street and Ellis avenue. A tubular boiler and American radiators will be used in the latter.

THE SMITH & ANTHONY STOVE COMPANY, proprietors of the Sanitas plumbing specialties, 217 Lake street, Chicago, are to furnish Sanitas traps for the Champlain Building, Adams and Dearborn streets, and the great Stock Exchange Building, La Salle and Washington streets.

The Chicago Master Plumbers.

The Chicago Master Plumbers held their regular meeting at the rooms of the association, 197 Madison street, Monday evening, Decembor 11. L. A. Seeberger, Secretary of the Chicago Real Estate Board, was present by invitation of the association, and addressed the meeting on the important topic of the damage and loss to owners and plumbers by the thievery of the plumbing material in unfinished and unoccupied buildings. Mr. Seeberger stated that while the remuneration to the thieves mi ht be but a pittance, the damage and loss to owner or plumbing contractor might be a hundred fold greater. He suggested the advisablity of the Chicago Master plumbers appointing a committe to act with a similar committee from the Real Estate Board to devise ways and means of suppressing the evil. The address was well received, and in accordance with the suggestion a committee was duly appointed. A. W. Zimmerman of Washington Heights was admitted to membership in the association. In order to afford all members an opportunity to participate in the nomination of officers, and to review the year's work of the association, the next meeting will take place at 2 p.m., Tuesday, December 26. Another meeting, for the election of officers, will be held January 8, 1894, which will also commence at 2 p.m. This will give members ample time to participate in the election. The officers of the association desire a full attendance at each of the meetings.

The season's export trade of Montreal, Canada, ended on November 22, when navigation was closed. From all reports the season has been an exceptionally poor one. Freights have been remarkably low and prices bad on the other side. The amount of grain shipped from the St. Lawrence was 22,500,000 bushels.

STEAM AND HOT WATER.

American Comments on English Practice.—II.

By Percival H. Seward.

Of course I went to church while over there, but as I had heard sermons which did not seem to differ much from the one on this occasion my eyes and mind naturally wandered to things which seemed strange to me.

CHURCH HEATING.

Heating being, of course, uppermost in my mind, I looked to see in what manner this particular church was heated. There were no stoves, of course. There were fire places and ranges in abundance, but not a single solitary stove so familiar to all Americans. Fire places? I could see none in this case, so I came to the conclusion that as the church was in a cold and exposed location it must have some kind of a hot air or steam heating system. I was rather inclined to think it was the former, as, on looking over the door of the pew, I could see, far down the aisle, what appeared to be a large hot air register in the floor. When I came to inquire into the thing, and finally got permission to make an inspection, I found that they had a kind of indirect hot water system in use; but, in place of the regular indirect stacks, I simply saw four 4-inch cast iron pipes, in a trench, running the full length of each aisle. An opening was left in one end through which cold air was admitted, while the hot air was, of course, taken through the registers, or rather gratings, placed in the floor.

I found afterward that this was a system which is in general use for warming such buildings as churches and schoolhouses. I saw one of these jobs being overhauled in a schoolhouse.

The old boiler was being removed to make place for a more economical one, which would burn only 50 per cent. as much fuel as had formerly been required. I inquired as to the amount of fuel which they expected to burn and was surprised to find that we would heat such a building to 70° in zero weather with 60 per cent. less fuel than they still expected to use to only partially warm to 60° or 65° in chilly (20° to 30°) weather.

This subject of fuel is one reason why they do not strive to make their boilers as economical as ours. The first thing purchasers want to know here is "how much coal will the boiler burn in a season," while there, on account of the cheapness of the coal, they do not seem to think of that item at all.

STEAM HEATING.

Steam heating does not seem to be much in use in England except for large buildings where high pressure is employed. I saw several buildings in London and other cities heated in this way which presented an appearance somewhat similar to ours. Exhaust steam heating I did not see at all, although I understand that it is used in quite a number of cases. Live steam direct from the boiler at full pressure seems to be principally used for large buildings. Heating contractors generally told me that it would cost more to put in a low pressure steam heating apparatus for a residence than hot water. I only saw one job and this was evidently put in from plans drawn by an American engineer, as nearly everything used was imported from here and presented quite a different appearance from their general run of work. No steam pressure (above the atmosphere) was carried intentionally, as it was run on what they call the vapor system of heating.

GUARANTEEING TEMPERATURE.

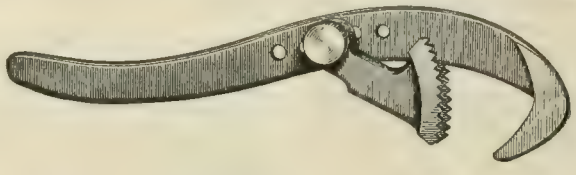
One firm I visited were just getting out plans for a system of hot water heating to be placed in a schoolhouse, and were very much troubled because they had to give a guarantee to maintain a temperature of 95° in any weather. "Why," I said, "we never close up a job without the usual guarantee that the apparatus when completed will warm the building to 70° in zero weather," which appeared to be very unreasonable, as they said they never guaranteed a job at all unless it was city or Government work, and then very seldom, if it could possibly be avoided.

The fact is they rarely figured out the pipe necessary to warm a residence, but simply put in whatever was handiest, as it did not matter what temperature the apparatus was capable of maintaining, the majority of their customers would use the open fire place in any case.

The prevailing idea in England is that we heat all our offices, sleeping rooms, schoolhouses, railroad cars, &c., to an entirely too high temperature, and those who had been over said that they felt the effects of our overheated, oppressive rooms very much. They preferred the hot water can and rug at any time to our overheated railroad cars. They have a mild climate, comparatively speaking, and do not care for living rooms at a temperature of more than 65°, and would actually refuse a heated sleeping room, while we want eating, sleeping and all other rooms at 70° at least in a climate where the thermometer sometimes runs down as low as 20° and 30° below zero. This, of course, is another reason why there is so much difference between us. We want well heated houses with everything connected with them as neat and attractive as possible, while they actually, in some cases, put in a heating apparatus simply to keep the chill off the rooms if the regular fires should for any reason be neglected and get low or go out entirely. When making any comparison it is well to remember that "circumstances alter cases."

GREENHOUSE HEATING.

In the matter of greenhouses they are not much behind us, as some people here still think 4-inch pipes are correct for this kind of work. This is rapidly being dispelled, however, as we can readily see from the manner in which small pipes are being more and more used. Small pipes are used here more than in England, as our very changeable climate demands an apparatus which will adapt itself very quickly to the sudden variations in temperature. A large body of water is too sluggish in its circulation, takes too long to heat when the house is cold and too long to cool when the house is hot. I explained to several people over there how this could be avoided by using small pipes, but they said at once that their temperature was generally stationary for days and weeks together in the winter months, and therefore they preferred a system which would hold its own in case of neglect to one which was more economical and effective when it was properly attended.



An English Pipe Wrench.

CONCLUSION.

I will say, in conclusion, that while my visit to England was necessarily short I saw many things which amused and also instructed me in this line of business. I noticed particularly that the subject of schoolhouse heating and ventilation is being agitated in a very effective manner. It seems to me to be a fight between systems of natural (cowls, &c.) ventilation and those which are mechanical (fans, &c.), although it is hard to see where there is any comparison between a fan system of ventilation and a few cowls and fresh air pipes. Mechanical ventilation seems to be making rapid strides, and although it is not likely that it will ever take the place of what we call natural ventilation (ventilation by means of columns of air at different temperatures), still it will hold its own and always be popular for some buildings.

[THE END.]

An English Pipe Wrench.

The annexed illustration shows the Tiger pipe wrench, patented by T. R. Paxton and manufactured by Timmons & Co., Birmingham, England. It is made entirely of wrought steel by special machinery and then tempered, giving it great strength and wearing qualities. Superior gripping power and the quickness with which it can be used are other features claimed. It is adjusted to different sizes of pipe by simply removing

the bolt from the movable jaw and replacing it in the proper hole in the lever jaw.

HEATING NOTES.

BUYERS of pipe cutting and threading tools and machinery will find the New York office of the Armstrong Mfg. Company at 139–143 Centre street after the first of the year.

THE FIRST CALENDAR to reach us this year is from the Gurney Hot Water Heater Company, with Boston office at 163 Franklin street and Chicago branch at 59 Wabash avenue. The calendar is a large card, the greater part of which is given up to a fine engraving of Nancy Hanks. We presume the suggestion is that the Gurney heater will circulate water with a speed equivalent to that in which the famous mare would cover a mile. The calendar proper is a pad of a dozen sheets attached to the lower part of the card.

THE RAYMOND & CAMPBELL MFG. COMPANY, Middletown, Pa., publish an estimate blank for the Sun steam or hot water heaters of their manufacture. The blank is arranged so that any one wishing an estimate will have little trouble in giving all the necessary information for the manufacturers to figure upon. The location, construction and particulars of the house are provided for, windows, hights of ceilings, size of cellar, flues, aspect of the house, &c., and in fact all that is called for in a preliminary estimate.

JOHN MANEELY, 219 Arch street, Philadelphia, Pa., who makes a specialty of steam and hot water fitters' goods and supplies, reports that the reception which has been given the Keystone radiators during their first year on the market has been in every way satisfactory.

IN A REVIEW of the trade of British India, published in the *Indian Engineer*, J. E. O'Conor mentions that the imports of galvanized iron have more than doubled in recent years. For roofing this description of material is in great demand in India, having taken the place of tiles or other material for sheds constructed by port trusts, municipalities, railways and mercantile firms all over the country. In the hills, private residences and stores, European and native, are universally being roofed with this material, the advantages of which are becoming generally recognized.

CASWELL & MOORE, Phœnixville, Pa., have the contract for roofing the furnaces of the Montgomery Iron Company, Port Kennedy, Pa. This firm of metal roofers are also figuring on a contract for the large pier shed to be erected in New York for the Jersey Central Railroad.

A curiosity in corporate literature is the following announcement in a recent list of applications for corporation licenses in Illinois: "Towaxystwo Porzyczkowe I Budowincize M. Kopernika, at Chicago; capital stock, $1.000,000; incorporators, John Bank, Frank J. Karch, Bernard Makiowicz, Adam Piasczynski, Frank Marcankowski, Frank Sowadzki and Kazinwinski Zychlinski." The population of Chicago is so cosmopolitan that foreign names appear very frequently in applications for licenses to incorporate, but this is, perhaps, the most striking specimen of an unfamiliar dialect to American readers that has thus far graced the official papers of the State of Illinois.

Inadequate Ventilation of Offices.

In an able article contributed to the Philadelphia *Record*, Dr. F. A. Adams touches on the question whether the large increase of steam heated office buildings, in which the great majority of rooms have no adequate means for renewal of the air to be warmed, does not, in large measure, account for the prevalence of pneumonia among those employed in such offices. Many of these buildings, Dr. Adams remarks, are admirably constructed to keep out air, whether cold or hot, this very perfection contributing to their insalubrity. In these hermetically sealed office rooms that abound in business buildings the steam heats the atmosphere to a delightfully comfortable degree, the occupant breathes and rebreathes the air during zero days when an open window cannot be endured, the effect being to silently undermine his powers of resistance, so that when he goes forth, exchanging such tropical air for the keen breeze of unrestricted nature, it happens that, through some subtle change in his system which has robbed his lungs of their power of resistance, their capacity to endure the onset or transition is gone, and the subtle poison of unrenewed air does its deadly work in the form of pneumonia.

The Golding Fire Proof Floor.

A series of experiments have been made lately at the Howard Iron Foundries, South Boston, with the Golding fire proof floor. At the suggestion of Capt. John S. Damrell, inspector of buildings, a section of the flooring in question was constructed in the foundry yard. It consisted of a section of single floor arch, with a span of 16 feet, making a surface of 62 square feet, resting upon iron girders, which were supported by four heavy timber blocks imbedded in the ground and rising above the surface about 4½ feet.

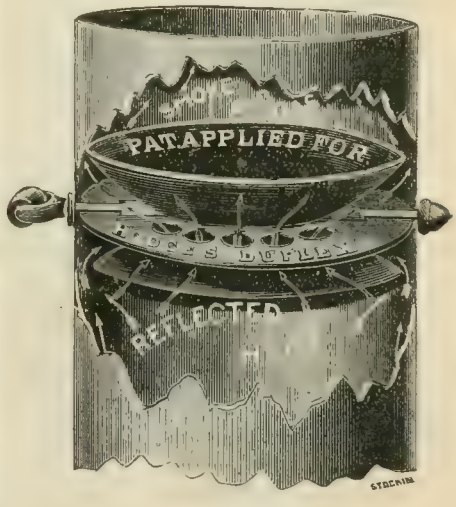
In making this arch, after the forming under boards were in place, the expanded metal, which is composed of meshes of steel, was stretched across and the cement concrete poured in and leveled up to the required hight, the metal being thus thoroughly imbedded in the concrete. On this was placed a single layer of boards. This was left to set and harden for about three weeks, though it is well known that it takes at least as many months for such concrete to even approach a maximum hardness and tenacity.

Tuesday evening pig iron was piled upon this floor arch to an amount equal to 750 pounds per square foot, or 46,500 pounds. Later an additional weight of pig iron was placed upon the arch of 9300 pounds, bringing up the total weight to 900 pounds per square foot. Up to 1 o'clock, even with this great load on, no perceptible deflection was noticed. When the time set for the exhibition arrived an additional weight of about 72½ pounds per square foot was put on, which brought the total load of the section of floor arch up to 60,310 pounds, or about 972½ pounds per square foot of surface.

Under this great weight the arch began to give, but the movement was at first slow, and even when it went down it was a gradual and easy descent—not a sudden disruption and a crash. When its central part reached the ground it still held together, and its ends did not leave the supporting iron cross beams.

Hodge's Duplex Damper.

The accompanying illustration shows a smoke pipe fitted with Hodge's Duplex damper, made by Hodge Brothers, 15 Chardon street, Boston, Mass. The special features of this new damper are readily understood. It consists of a round disk, on the top and bottom of which are concave reflectors. These reflectors are not quite so large as the pipe, giving passage for the smoke and products of combustion around the outer edges. Holes in the middle of the disk furthermore allow the gases to pass on up the chimney. In this way the smoke and gas are permitted to escape. A special feature claimed for this device is that the heat is retained and not wasted up the chimney. The claim made is that the concave reflector holds back the heat where it is wanted. The dampers are described as well finished, with an enameled wood handle, and are made in sizes from 3 to 10 inches, while larger sizes will be made at short notice.



Hodge's Duplex Damper.

Speaking of the comparative value of metals, Thomas A. Edison said recently: Gold is only valuable because it is rare. It is not nearly so useful as iron, which is the real precious metal. Aluminum is too soft, it is light but it lacks strength. The metal of the future is nickel steel, which combines strength with pliability. Gold is not worth as much as lead in commerce, and brass is more than worth its weight in gold.

An English scientist, Dr. Cohen of the Yorkshire College, has been making some interesting experiments as to dust particles in the atmosphere in different parts of the city of Leeds, on a clear day. It was found that at Woodhouse Moor, a large open space, there were 530,000 particles to the cubic inch; on the Yorkshire College tennis court, 850,000; at the Town Hall 1,200,000, and at the parish churchyard 3,500,000.

The North German Lloyd Steamship Company have established a new line of steamers to ply between Baltimore and Bremen.

TIN PLATES.

Exports of Tin Cans.

The vastness of the growing canning industry in the United States, and its bearing on the tin plate trade of the country, is commented on by a writer in a recent issue of the *American Exporter*, who gives figures to show how much of the tin plate imported and consumed by this country is re-exported annually in the shape of cans containing preserved products. Taking only a few lines of tinned goods, we find that in 1892 the following were exported:

Breadstuffs prepared and shipped in tins	$1,714,000
Canned salmon	1,738,000
Other canned fish	225,000
Canned fruits	2,498,000
Canned beef	7,876,000

These few canned articles alone reached a total value of $14,051,000. If were added the cans containing kerosene, lubricating and other oils, and the numerous other articles which are exported in tins, it would be better appreciated how large a portion of the $20,000,000 worth or so of tin plates we import annually is again sent out of the United States, much of it returning to the country from which we first received it. This is not, moreover, the only form in which tin plates are re-exported. The export trade in culinary and other household tinware is also attaining some importance, and is annually adding to the consumption of tin plates in this country.

SCRAP.

THE PLANT of the Locust Point Iron & Steel Company, at Locust Point, Md., has been sold to Mrs. Anna A. Coates for $25,000. The sale was made by virtue of decree of the Circuit Court of Baltimore. The property included the rolling mill and tin plate works, as well as considerable adjoining property.

THE JERSEY TIN PLATE WORKS and the Vernon Tin Plate Works, both at Britton Ferry, Wales, have lately been added to the list of idle plants.

F. R. PHILLIPS of 200 Walnut place, Philadelphia, is supplying to the Phillips Tin Plate Company of Philadelphia an improved Phillips automatic adjustable tinning machine, which, with three other machines already in operation, will give that company a capacity of 1000 boxes per week. Mr. Phillips is also building for N. Tratter & Co., Philadelphia, a new tinning plant to contain five Phillips improved tinning machines. Among other machines recently shipped have been three to the Newcastle Tin Plate Company, five to N. & G. Taylor Company, Philadelphia; three to the Chicago Stamping Company, two to the Canonsburg Iron & Steel Company, two to the Meurer Bros. Company, Brooklyn, N. Y.; one to the Lalance & Grosjean Mfg. Company, Harrisburg; two to Gummey, Spering & Co., Philadelphia, and one special machine for heavy work to the Iron Clad Mfg. Company, Brooklyn, N. Y.

THE ENGLISH TIN PLATE MANUFACTURERS and operatives are naturally much interested in the fate of the Wilson bill, or, at any rate, in that portion of it that relates to the proposed readjustment of the tariff on tin plates. In a recent issue, the *Western Mail* of Cardiff, Wales, prints an interesting interview with Lewis Richards, president of the Tin Plate Workers' Union, in which he states that over 200 British tin plate mills are idle, out of a total of 500. "Since the McKinley scare," Mr. Lewis is quoted as saying, "the state of trade has been very unsatisfactory. We are hoping that, with the almost certain reduction of the United States tariff and the fact that the large number of mills idle must have materially reduced stock, we shall enter upon a period of prosperity with the new year."

EXPORTS OF TIN PLATES from Great Britain for the month of November were 26,000 tons, as compared with 29,000 tons in the corresponding month of last year. Of this amount 15,000 tons were sent to the United States, being a slight increase over the shipments for October, but falling short by 5000 tons of those for November, 1892.

THE PHILLIPS TIN PLATE COMPANY of Philadelphia have built an extension to their works 50 x 60 feet to accommodate three additional sets of tinning machinery.

THE CIRCULAR and price-list published by the Apollo Iron & Steel Company, Pittsburgh, Pa., is a handsome example of a trade publication. At first sight it appears to be an ordinary price-list, 6 x 3½ inches, printed in colors, but closer inspection shows the care and expense that have been given to its preparation. The cover is of heavy paper, bearing the name of the concern and list of their manufactures, which include galvanized sheet iron, terne plates, iron and steel sheets, &c. The middle of the cover bears the trade-mark of their galvanized sheets, printed in red. The inner pages, 12 in number, are printed on one side of the sheet. A notable feature of the entire publication is that every page is printed from steel plate, three colors of ink being employed, black, red and blue, the larger letters looking as if they were put on in oil with a brush, while the text and figures in black have that clean, clear cut appearance of steel plate work. The first page gives a price-list of galvanized iron according to the list adopted July 1, 1893. The next page gives the extras. Then comes an announcement page relating to roofing sheets and terne plates, followed by reference to their Apollo special soft steel and next their Apollo refined. The back cover shows the standard gauges for black sheets as adopted by the United States Government and taking effect last July.

A RADICAL DEPARTURE from old established methods is made in the design of an annealing furnace recently invented for the purpose of annealing small sheets of steel used in making tin plates. The old practice of charging and drawing boxes through doors at the side of the furnace is abandoned, the furnace being built vertically and charged in that manner. By a simple arrangement annealing boxes, together with their bottom plates and contenst, are easily handled by two men, manual labor is largely dispensed with, and there is consequent saving in labor cost. It is claimed that the furnace is economical in construction and maintenance. The design is adaptable for using various kinds of fuel, such as coal, natural gas, crude oil or fuel gas. A. Beard, Cambridge, Ohio, is the inventor.

THE NEW CASTLE TIN PLATE COMPANY, New Castle, Pa., have just placed in position at their works what is regarded as the biggest tin whistle in the world. It is over 10 inches in diameter and is the design of Chas. Greer and Master Mechanic H. Hartsuff. Its voice will be heard at various times during the day and at nine o'clock every evening, when the night shift goes on duty.

Negro Skill at Tuskeegee.

As illustrations of the capacity and skill of the negro when efficiently trained, a Southern correspondent of the New York *Evening Post* recounts the following particulars of work and accomplishment lately carried out by teachers and pupils of the Tuskeegee Industrial School for negroes in Alabama, all of whom are colored: Professor Taylor drew the plans from which the large three story brick addition was made to Alabama Hall, Tuskeegee. He furnished the drawings for the industrial building, at Mount Meigs, Ala., also the designs for some pretty cottages of five and six rooms each, for teachers' homes. Professor Calloway is an authority on surveying in this country. He recently completed a clever bit of civil engineering in bringing water to the school from a mile away, and in laying off a system of mains to carry it to every building on the school grounds.

At the blacksmith's shop Professor Simon has made a very neat steam engine from his own drawings, which is now used to run the large Campbell cylinder printing press. A canning factory, with a capacity of 2500 quarts per day, was in successful operation during the season of fruits and vegetables. Our resident physician, Dr. Dillon, passed the summer in Philadelphia, taking special courses of study in the treatment of the eye, ear, nose and throat. Professor White of the Boston Conservatory of Music has taken the first steps toward the establishment of a similar institution here. After a close connection with the school, during 11 of its 12 years of work, I am pleased to say that no enterprise, started here, has failed for want of skill on the part of those having charge of it.

The town of Danbury, Conn., has appropriated $50,000 to provide employment and otherwise relieve the destitute of that community.

ROOFING AND CORNICE.

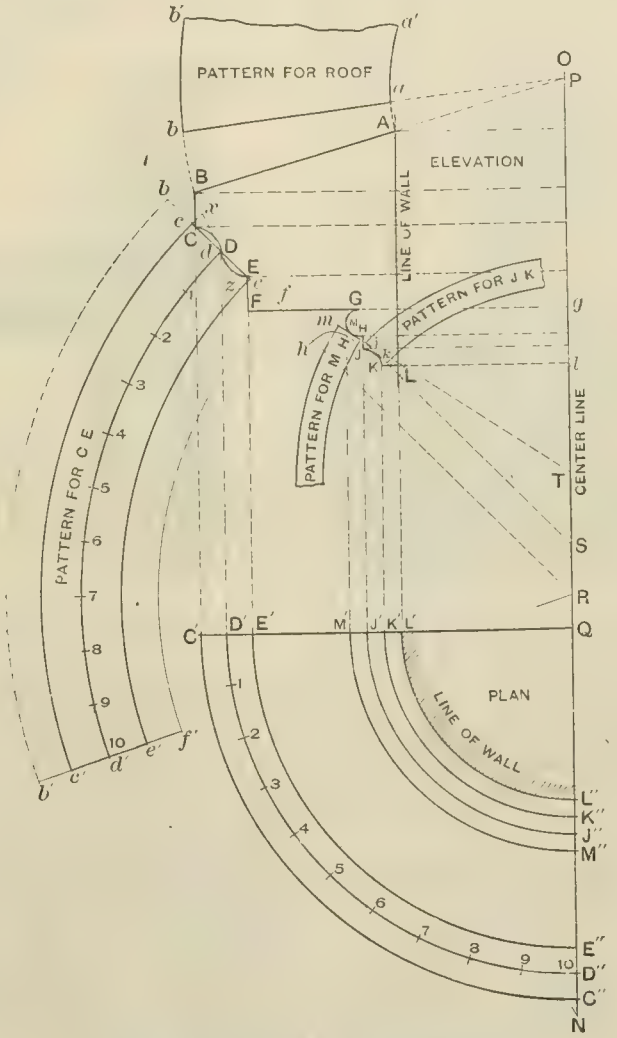
Blanks for Circular Cornice.

From C. U. B., *Louisville, Ky.*—I would like to be informed, through the columns of *The Metal Worker*, of a method for obtaining the patterns or blanks for the various moldings used in a cornice to go around a circular tower. The profile of the cornice is inclosed.

Answer.—In the accompanying engraving is shown the quarter plan and elevation of a circular cornice for which the pattern blanks are required. By an inspection of the cut it will be seen that a considerable portion of the patterns can be obtained from the elevation without referring to the plan, yet the plan will be found convenient for obtaining the stretchout of parts and obtaining some of the patterns. To obtain the pattern of roof, or such part as may be desired, extend B A to the center line N O, and, with P as center, and P A and P B as radii, strike the arcs indicated by *b b'* and *a a'*. Draw the line P *b*, and on *b b'* lay out a stretchout of C' C'' of plan, and from the point thus obtained draw a similar line to P. Such allowances for edges as may be desired are to be added. On account of space only part of roof pattern is shown.

For B C a strip having the width indicated by B C and the length shown by C' C'' of plan is required. The principle to be employed in obtaining the pattern for C E is simply that which would be used in obtaining the envelope of the frustum of a cone. To do this, the general average of the profile is to be taken in establishing the section of the cone; that is, a line is to be passed through its profile in such a manner that the frustum obtained can be formed to the shape with the least labor. In the present instance we will assume that *c e* is the proper line to draw. From D set off the stretchout of D C and D E, as shown by D *c* D *e*. Prolong *c e* until it intersects the center line N O in the point R. Then we can consider R to be the apex of a cone of which *c e* represents a section. If it is desired to measure the pattern from point D of profile, drop a line from D to D' of plan and strike the arc D' D'', which divide into any convenient number of parts. From R as center and R D as radius strike the arc D *d'*, and on this arc lay off a stretchout of D' D'' of plan, and through the last point obtained, as *d'*, draw R *d'* extended. From R as center strike the arcs *c c'* and *e e'*. If C B is required on the same piece it can be added to the pattern just obtained, as shown by *b' b c' c*. The pattern of E F can also be added, as shown by *e e' f f'*. If it is desired to have the blank with less flare, as indicated by the dotted line *x z*, it can be struck from point N as center.

The pattern for E F can be obtained as directed for B C, the stretchout being obtained from E' E'' of plan. The pattern of the planceer F G of the elevation can be obtained by taking E' J' J'' E'' of plan, or the distance from G M H would be to take a strip whose width would be equal to the stretchout of G M H, cut in a short distance along the edges, and then raise to shape. The width of H J is given in the elevation, and the length can be obtained from J' J'' of plan. If J K was to be formed by stretching, we would draw the average of the profile, making it equal to the stretchout of J K, as indicated



Blanks for Circular.—Plan and Elevation.

F to *g* and G to *g* in elevation can be used for radii in striking the pattern. If G M H is to be made in halves, the joint being at M, and the parts brought to the desired shape by raising, a line that would represent the average of the profile, as *m h*, could be drawn and extended to point T in the center line N O, and T *j* and T *m* used for striking the pattern, only part of which is shown. The same pattern would answer for G M.

Another method for constructing by *j k*, extend same to the center line, and use S *k* and S *j* for striking the pattern. If it was desired to form the part from H to L in one, the required amount of material could be added to the edges, as was done in the case of the pattern for C E. The radii for striking the pattern for K L can be obtained from the plan or elevation, as may be desired. While the net patterns only are shown, such allowances for edges as the method of construction requires are to be added.

FLASHINGS.

THE NEXT ANNUAL MEETING of the National Iron Roofing Association, which we understand is to be an important gathering of the organization, will be held the second Thursday in January, the 11th prox., at either the Southern or Linnell Hotels, St. Louis, Mo. The trade will take notice that the day of the meeting has been changed to Thursday instead of Tuesday, as formerly existed.

THE FIRM OF MARLIN & CO., Allegheny, Pa., manufacturers of water conductors, eave troughs, metallic skylights and galvanized iron cornices, have been succeeded by the firm of Marlin & Co., Incorporated, the change going into effect on Friday, December 1.

MANUFACTURERS of tin shingles say that if the proposed reduction of the duty on tin plates is carried out the consequent reduction in the price of the plates will enable them to compete very closely with wood shingles and slates.

THE PENN IRON ROOFING & CORRUGATING COMPANY., Ltd., of Philadelphia, have received a pleasing letter from the management of the Scattergood Building, in Birmingham, Conn., in regard to the five steel ceilings put up in that building by them. One of the ceilings is in the auditorium, a portion of the building to be used for church purposes, and capable of seating 2500 people. In speaking of the acoustic qualities of the ceilings, the writer states: "On Sunday we had a crowded house, and the singing and speaking were as clear as if the room was empty, which cannot be said of plaster or wood."

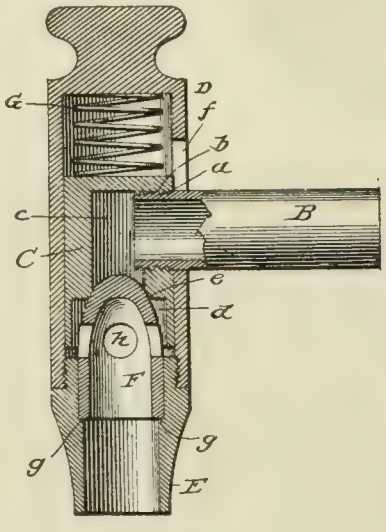
A FIRE recently burned out the shop of Guindon & Durant, coppersmiths and cornice makers, at Boston, Mass. The loss is said to be about $3500, on which there is an insurance of $2500.

A NOTICEABLE IMPROVEMENT in the demand for sheet metal working machinery, particularly such as is especially adapted to sheet metal roofing, is noted by Geo. C. Keene & Co. of Cincinnati, Ohio. Within the past week they have shipped the following: One large flanging machine to the McClary Mfg. Co., London, Ont.; one 8-foot geared brake to the New York Exhaust & Blow Pipe Company, Hartford, Conn.; and a carload of cornice and roofing machinery to the Allen Cornice Works, Chicago, Ill.

THE KANSAS CITY METAL ROOFING & CORRUGATING COMPANY, Kansas City, Mo., advise us that notwithstanding the general depression in business their sales have steadily increased. They attribute this to judicious advertising and meeting the demand by making prices as low as is consistent with honest goods. They have unexcelled facilities for shipping, being able to secure low freight rates to all points in the West and South, and are in a position to handle carload lots or less of any of the various lines they carry. Their lines embrace corrugated iron in all its forms, for roofing, siding and ceiling, standing seam roofing, steel and one-third steel; both self capping and in rolls, V-crimp, beaded ceiling, steel imitation brick, &c. They also handle the well known Empire sheathing and all other kinds of building paper, felt roofing, mineral wool, iron cresting, woven wire fencing, wire railing, &c. They issue a series of catalogues, circulars, &c., which will be sent upon application.

Cock for Water Cooler.

Savill, Walls & Co. of Philadelphia, manufacturers of plumbers' supplies, are putting on the market the cooler cock shown in the accompanying cut. The cock is designed with the object of furnishing a simple, durable and compact self closing cock, constructed so that a minimum amount of frictional wear will result from its use. In construction the cock is simple. B is the draw off pipe connecting with a cooler or other vessel, screwed by means of the threads *a* and threaded aperture *b* into the head C. The head has a chamber, *c*, communicating with the draw off pipe. At the lower end of the head is a large recess, *d*, communicating with the chamber *c* in such a way as to form a shoulder, *e*, to serve the purpose of a valve seat. D is a sliding casing surrounding the head C, having a longitudinal slot, *f*, for the passage



Cock for Water Cooler.

of the draw off pipe, and provided with a spout or nozzle, E, which is detachable. The bore of the spout is reamed out at one end, as shown, so as to form the valve support *g*. F is a loose valve, hollow, and provided with apertures, *h*. The valve has a conoidal upper end, in order to allow of its normal closing, lightly, in the seat *e*, thus effectually preventing the passage of water from the chamber *c*. Owing to the peculiar form of the valve, it is claimed that in the case of the seat *e*, becoming worn and enlarged the valve will extend further into the chamber. G is a spring to hold the head C upon the valve F.

The makers claim that the valve is simple in operation, depression of the head being all that is necessary, and that frictional wear of the parts cannot affect its efficiency. The cock was invented and patented by Jas. H. Savill.

Stephen J. Meeker, president of the New Jersey World's Fair Commission, a large manufacturer of malleable and gray iron castings, at Newark, N. J., says that the Commission is waiting for bids for the New Jersey State Building in Jackson Park. If a good price is offered the building will be sold, otherwise the building will be taken down and brought to the State and probably erected at the Sea Girt Encampment as a military headquarters for the Governor. The building is an exact duplicate of the historic Washington's headquarters at Morristown, N. J.

The Electrical Co-operative Kitchen.

Of the possibilities of the co-operative kitchen with electrical cooking apparatus W. S. Keys argues forcibly that it is really as foolish for the housewife to undertake the cooking for her family as it would be to spin and weave their clothing, or to make, in her own bungling way, the family's shoes. Cooking is a fine art; and the individual kitchen, besides being necessarily costly and wasteful, contrasted with the cheap and saving co-operative system, seldom (relatively to members) produces really fine and excellent cooking. On well prepared and appetizing food depends, to no small degree, not merely the comfort, but the health of the family. Intelligence must preside over the kitchen as well as over the general affairs of the family; and upon it we must depend for the rescue from the extravagance of maintaining and running separate kitchens and the unnecessary waste and blundering. The relief from the cooking and the laundry work would enable the housewife to make almost a pleasure of the rest of the work—the sweeping, dusting, cleaning, table setting, dish washing—and enable the establishment of a more systematic and saving arrangement. All supplies would be purchased by wholesale; the "help" would be competent and would understand the work, and there would be no waste, every scrap would be saved. Each family would receive its daily bill of fare, nicely and intelligently cooked, to be served at home. It is the estimate of an experienced authority, Mr. Key says, that a person's meals, nicely cooked by an experienced *chef*, could be furnished for $1 a week, if a hundred were thus to be provided for at the same time.

An electrical kitchen is described by Mr. Key—and he attended a dinner, given to a dozen persons, that was cooked in such a kitchen, by the appliances of the Electric Heating Company of Boston—a first-class dinner, under the supervision of an Italian *chef*—and it was cooked without a spark of fire. The kitchen had no stove or range. A large elevated cupboard, to hold all the utensils, had, running along its bottom front, an electric switchboard, furnished with essentially the same appliances as a telegraph switchboard. Below and in front of it was a dresser or table, on which were the kettle, coffee pot, saucepan, plates, &c., each utensil connected electrically with the switchboard. The big oven was at one side, with the steak broiler on top, and a flue to carry off all fumes. Beyond it was a upright copper boiler, that furnished hot water to a sink and washbowl on the other side of the room. Everything was heated and cooked by electricity, and the roast joint in its gravy from the oven, the steak from the "grill," and the vegetables—all were as appetizing as any ever cooked by the best fire. This is all significant of what we may expect a dozen years hence.

Arnold H. Moses, one of the firm of architects of Moses & King of Philadelphia, Pa., resides at Merchantville, N. J., and represents that city in the New Jersey Sanitary Association.

For two days, recently, a monster eel stopped up a water pipe in Boston, until forcibly removed.

THE RETAIL STORE.

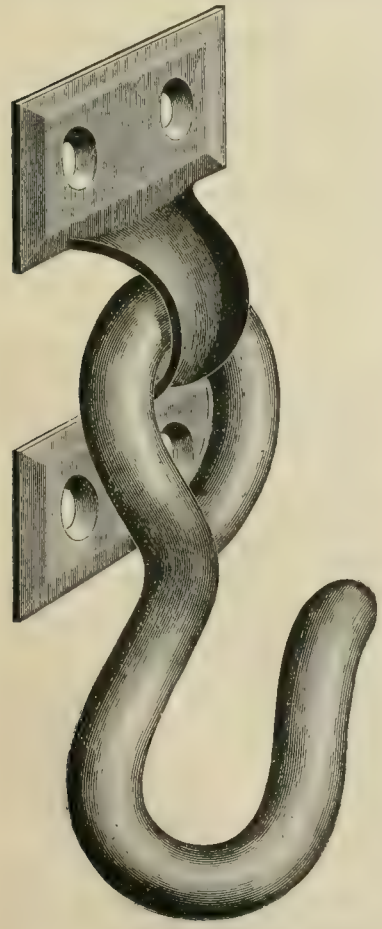
Steel Broiler.

The accompanying cut represents a steel broiler being introduced by the Cleveland Stamping & Tool Company, Cleveland, Ohio. The broiler is made of a single piece of heavy, cold rolled steel, all in one piece, which the manufacturers claim is peculiar only to this broiler. The point is made that it has no seams or rivets to catch grease, that it will not warp, that it cannot be broken and that it catches all of the juice of the meat.

Steel Broiler.

Stearns' No. 200 Hammock Hook.

E. C. Stearns & Co., Syracuse, N. Y., are putting the hammock hook herewith illustrated, on the market. The plate is made of a special quality annealed sheet steel, and the hook is formed up from ⅜-inch wrought iron. The company state that the article is the result of a great deal of experimenting on their part to produce a hook which would be lighter than those now on the market, and at the same time possess equal strength; that although the hook is very light it is at the same time capable of sustaining great weight, and that they have no hesitation in pronouncing it as strong as any of the regular size hammock hooks on the market. The hooks are tin finish, and are packed 1 dozen in a box.



Stearns' No. 200 Hammock Hook.

The Safety Cistern and Well Cover.

The Safety cistern and well cover shown in the accompanying cuts is offered by Menefee & De Vilbiss, Fort Wayne, Ind. The cover is made of cast iron, japanned to prevent rusting, having an outer rim (Fig. 1, Letter A), which is to be firmly cemented to the wall of the cistern or well, to obviate any possibility of bugs or worms getting into it. It is provided with an adjustable lid (Fig. 1, Letter B), to be used in connection with a pump, to fasten it in position, as in Fig. 2. For a pump placed in the house a solid lid is provided (Fig. 1, Letter C), instead of the split lid, this being fastened by a lock bolt, to obviate danger to children. The cover is provided with an air box, to allow foul air to escape, to keep the water in a pure and healthy condition. It is explained that the construction is such that no surface or waste water can possibly return into the cistern or well, and that either lid can be removed without disturbing the outer rim by the use of a common wrench. The manufacturers remark that the device, besides being as cheap as others, is free from dirt and insects, and that it is not open to the objections of wood covers, the underside of which become damp, causing decay, a growth of vegetation, and become inhabited with vermin, small snakes, &c.; also that, unlike wood covers, it will not become rotten and unsafe.

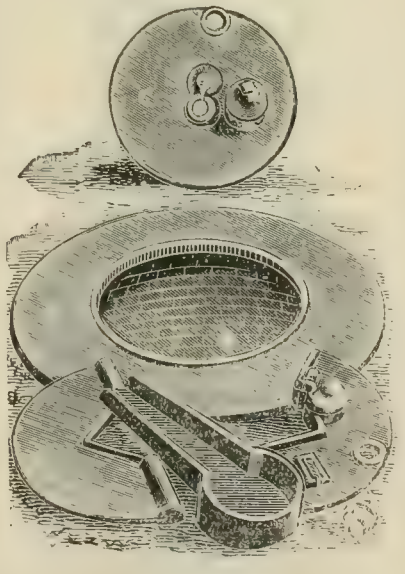


Fig. 1.—The Safety Cistern and Well Cover.

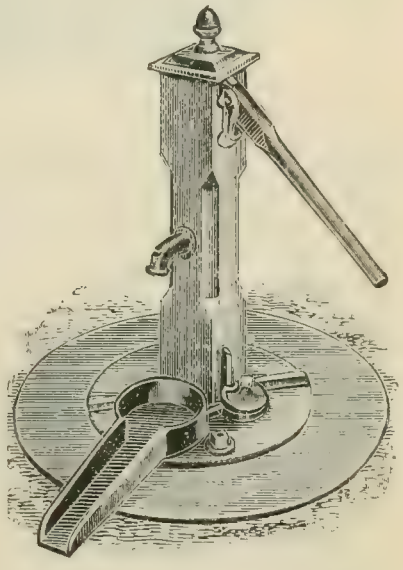


Fig. 2.—The Cover in Connection with Pump.

Holiday Show Windows

Additional attention may profitably be given to dressing show windows in anticipation of holiday trade. Activity in this direction need not be confined to merchants who make a special feature of Christmas goods, as those who carry Housefurnishing, Sporting and Athletic goods have many articles in stock, which, if presented to the public in holiday attire, will solve for them the vexing question of what to buy for presents. In fact, it is more needful for those to make a display who have not the reputation of handling holiday goods than for those stores to which purchasers would naturally go to have their wants in this direction supplied. At this time of the year customers hold their purse strings less tightly and expect to be more liberal in their purchases than at other seasons. These facts should be taken advantage f and high priced goods and those which have been hard to dispose of, which might be considered at all suitable for presents, can now be brought forward with good effect. Articles which are old to the merchant, and which he may be disgusted with, are probably new

to the majority of his customers, and will repay some labor in putting them in an attractive condition. It may be surprising, after the holidays are over, to see how many of these old stand-bys have taken to themselves wings.

While every one is supposed to know the use of most articles kept in a Hardware store, nicely lettered cards attached to the article, giving its name or use, will attract attention. In addition to the name some sentence, as, "Does your wife sweep?" "How's the old Tea Pot?" "A nice Christmas present!" "Does the boy skate?" "This is no hair splitter, but cuts clean!" &c., attached to corresponding articles, will produce the desired effect in many cases.

Prices marked in plain figures and placed on articles in the window will catch many customers, especially as many buyers have decided just the amount they will spend for each gift. If the article is made to appear to them suitable and the price comes within their means, an examination of the goods, with a few judicious words from the salesman results in a sale. The purchaser would probably not have come into the store to inquire the price, especially if not in the habit of trading there. The majority of people will buy presents, even if it involves going without some of the necessaries, and such prices should be made that will appeal to buyers as bargains. In such times as these merchants may be satisfied with the exchange of goods for the cash, at a slight advance on the cost, rather than expect large profits because it is holiday time.

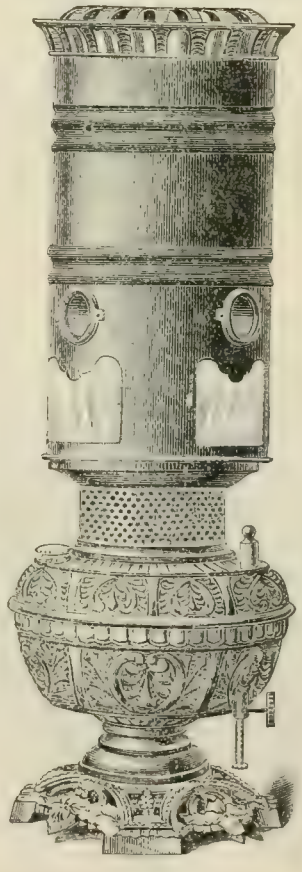
This principle applies to Christmas window dressing, as to any other—not to have the window crowded. An attractively arranged window, with goods shown as nearly as possible in the manner in which they are used, supplemented by a bright colored sign outside calling attention to Christmas goods, will cause people to stop in front of the store. In making signs, prices and cards for the display goods something better than wrapping paper and a marking brush is demanded. People will judge the quantity and quality of the goods before seeing them, by the quality of the signs. Let these be made by the best sign writer within reach and be done in his best style.

Something green in the window helps the display, as evergreens are so intimately associated with the popular idea of Christmas. Not too much green, but enough to give the window a decided holiday effect; not as if the evergreens got in there by mistake, but showing care and taste in arrangement and that a definite object was in view. An advertisement in the local paper can be used to advantage, in which special attention should be called to the window display. Articles in the window can be changed about each day for sake of variety, other goods substituted, and goods disposed of for future delivery can be marked "sold," showing business is being done.

All the foregoing suggestions are based upon any present stock, without special additions of holiday goods, and the work of getting things in shape for display cannot be commenced too soon.

Banner Oil Lamp Stove.

The Plume & Atwood Mfg. Company, 18 Murray street, New York, are introducing the oil lamp stove herewith illustrated. The fount and base of the lamp are nickel plated. The body of the drum is made of Russia iron, with round openings arranged to allow a continuous flow of cold air to be drawn into the flame, there to be heated and to be thrown off, largely increasing the heating capacity of the stove. The entire top lifts off from the fount for lighting, cleaning or trimming. The draft is regulated by an inside drum and side



Banner Oil Lamp Stove.

air chamber, so that no chimney is required. The flame is regulated by their Banner screw wick movement, which allows of nicety of adjustment. The manufacturers state that the fount has a capacity of about 1 gallon of oil, that it burns from 10 to 12 hours, without odor, heating comfortably at a nominal cost a room 15 feet square. The stove is referred to as especially valuable where only temporary heat is required, as in bedrooms, bathrooms, &c.

The Delmonico Meat Tenderer.

Pullman Sash Balance Company, Rochester, N. Y., are putting the meat tenderer shown herewith upon the market. The knives are described as made from tool steel, ground to a chisel point. The plunger, as shown in Fig. 2 is taken out by removing the pin when cleaning and washing the tenderer. The parts, it is stated, are all interchangeable and are easily kept clean. The tenderer is furnished both in tinned and japanned.

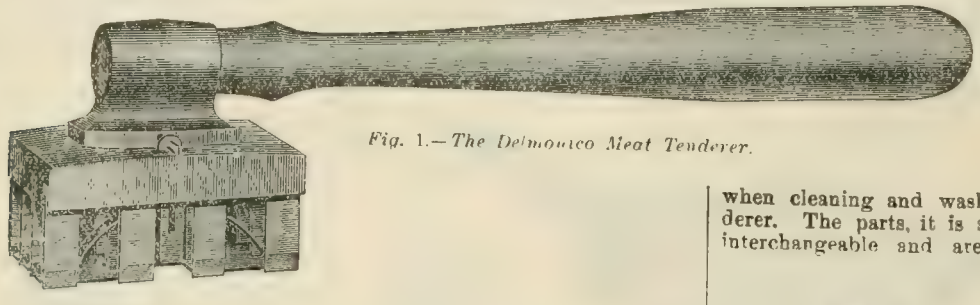


Fig. 1.—The Delmonico Meat Tenderer.

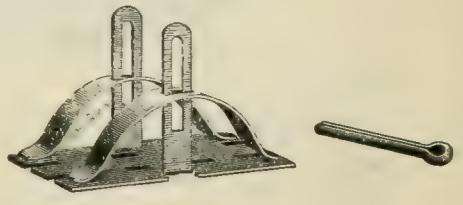


Fig. 2.—Plunger and Key.

MEMORANDA.

FRED. F. WHEELER of Albany, N. Y., who has been the South Pearl street dealer in Acorn stoves and ranges and house furnishing goods, has located in the handsome new building of the Albany Public Market Company, on Beaver street, and has an immense store there.

THE HARDWARE BUSINESS of A. M. Smith, at Silver Springs, N. Y., has been purchased by George E. Piper, who took possession December 1.

AN ENTERPRISING Brooklyn merchant recently hit on a novel mode of advertising. He purchased several thousands of high grade flat steel keys of a well known lock company, to each of which a tag with blank spaces for name and address was attached. These, with a four-page circular directing attention to many articles for sale, with prices, were inclosed in envelopes, and extensively distributed in territory adjacent to his premises. In the circular reference was made to the key, saying that 10 per cent. of the keys would fit a lock hanging just inside their door. Every one who succeeded in opening the lock would secure a neat sewing chair. In addition, all the keys entitled the holder to a chance at a handsome parlor suit then on exhibition in their window. After trying the lock the key was dropped in a box for a future drawing for the suit, the tag containing the person's name and address.

The Herreshoffs of Bristol, R. I., have received an order from a New York man for a Tobin bronze steam yacht, which, it is said, will be the finest yacht afloat. These famous builders are enthusiastic over the future and efficiency of Tobin bronze in yacht construction.

Ingenious Device for Catching Thieves.

The Hardware firm of Foster, Stevens & Co., Grand Rapids, Mich., recently employed electricity and photography to detect a burglar. It being found that their money drawer was systematically robbed at night, W. D. Stevens of the above firm applied to the Grand Rapids Electric Company to devise some scheme by means of which the thief might be detected, and suggested what may be termed the Electro-Photographic method.

The Electric Company's efforts resulted in the detection of the thief, the method adopted being shown in the accompanying illustrations. The device as first arranged is shown in Fig. 1, the camera being so placed as to get a front view exposure of a person standing before the money drawer. Electric connection was made with the Electric Company's plant to operate the device. A burglar alarm device was fitted on the money drawer, so that when the drawer was opened the shutter of the camera operated, exposing the lens, at the same instant setting off a flash light. The night after the apparatus was first put in place the thief opened the till and the apparatus worked just as had been designed, but the thief, in order not to be seen from the street, had placed himself under the desk and drew the drawer out over his head. Upon developing the plate the following day it was found that a good photograph had been taken, though the thief was not in it. The night man was, however, arrested the following day upon suspicion, and quickly confessed all when asked if he knew that his photograph was taken when the light flashed in his face. The flash light flared up the moment the drawer was pulled out, but the thief continued his work and rifled the till. He came to the conclusion that he had been discovered, and was easily brought to confession.

The second apparatus designed, as shown in Fig. 2, is referred to as working well, but no thief has yet appeared to be operated upon. The plan, no doubt, is capable of wide application. All parts of the apparatus can be so arranged as to be thoroughly concealed from the eye of the thief. An indisputable and convincing proof of guilt is a photograph of the offender, taken in the act; and the foregoing plan suggests a safe and efficient method of detecting burglars, which is capable a of wide adaption.

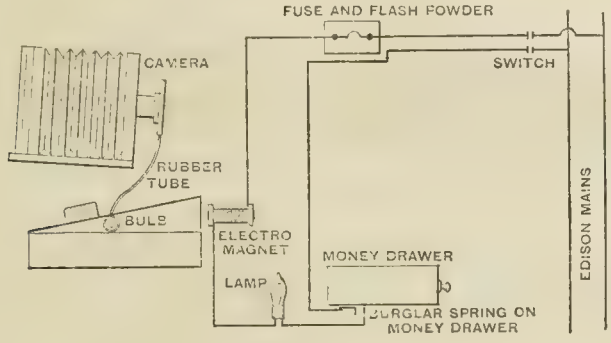


Fig. 1.—Photographic Detection of Burglars.

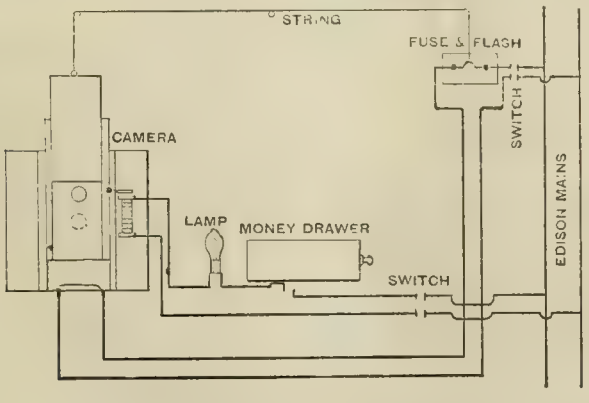


Fig. 2.—Another Arrangement of Apparatus.

Origin of Hardware Terms.

There is more or less uncertainty as to the origin of many trade terms in general use, and not a few of the designations of various kinds and sizes of Hardware articlesare involved in obscurity as to the reason for their adoption. As examples of this the way in which Nails are designated as 10 or 20 penny, the gauge of Shotguns, the numbers of Screws, Caps, &c., will readily occur to our readers. These and similar terms have been unquestionably in use for a long time and the origin of terms is largely tradition, as most of such markings originated with foreign makers before Hardware was manufactured in this country. When similar goods were first made here the designations familiar to the trade were naturally adhered to by the American producers so that confusion might be avoided, in very much the same way as American Tin Plate makers have adopted the foreign terms to designate the different grades of American Tin Plates. Among well informed persons explanations of most of these terms are, however, current, and in many cases there is little reason for doubt as to their correctness. In some instances, however, there are different and inconsistent explanations given and on these questions there is of course, more or less doubt. We give below the opinions of well informed parties as to the origin of some of these designations:

The Gauge of Guns.

The usage by which the bore of Guns is designated, as, for example, 12 gauge, is supposed to have originated in this way: The gauge of Guns was determined by the number of pure lead bullets, spherical in shape, any one of which would fill the bore of a Gun. Thus a gun whose bore would be filled by one of 12 such bullets weighing together a pound was termed 12 gauge.

Numbers of Caps.

The numbers given to Caps are supposed to have been arbitrarily given by foreign makers and were continued by American manufacturers when the goods were produced here.

Bastard Files.

The origin of the term "bastard" as applied to Files is generally explained in this way: The rough File was first made, then the second cut. A demand for a File between the two was afterward developed, which being out of the regular line was termed bastard.

Penny Applied to Nails.

Two explanations are current in regard to the use of the term "penny" as a designation of the size of Nails. The one which is very generally adopted is as follows: That the word penny is a corruption of pound. Thus, a 4d Nail was one of such a size that 1000 of them weighed 4 pounds. It may be remarked that originally the term "100" when applied to Nails was six score, or 120, consequently the 1000 was 1200. Another explanation is based on the fact that Cut Nails are comparatively of recent date, having been first made in this country, and were introduced in England as late as 1846. Formerly all Nails were forged, and the price for forging 1000 1½-inch Nails was 4 pence, or as the term is now used, 4d; the price for forging 1000 2-inch or 6d Nails was 6 pence and so on. As a reason why small Nails could be forged so cheaply it is stated that children often did the work.

Numbers of Horse Nails.

The numbers given Horse Nails are supposed by some to have originated in the same way as penny with Cut Nails, according to the first explanation given above. Thus, 1000 of any size weighed the number of pounds designating the number of the Nail. No. 6 Horse Nails would then weigh 6 pounds to the 1000; No. 8, 8 pounds, &c. It is obvious, if this explanation is correct, that the present weight of any number of Nail does not correspond to the original weight of the same number.

Numbers of Screws.

The numbers by which Screws are known designate the numbers of the Screw gauge to which the sizes of the Screws correspond. It would appear that Screws were first made in the various sizes and then a Screw gauge made as a standard, and Wire used in the manufacture of Screws drawn to conform to this standard gauge. The Screw gauge bears no relation to the Wire gauge, as in the case of Screws the largest number designates the largest wire, while in the Wire gauge the largest number represents the smallest size Wire.

STOVE TRADE NOTES.

The Stovemen's O. F. and L C. Club.

BY JEEMS.

This club, unimportant to the public, but the center of the universe to its members, is in quite a quandary regarding their future course. Like all other organizations, they have not escaped the prevailing pecuniary epidemic, and they have reduced their daily expenses down to such a fine point that death would probably ensue if any further retrenchment was made, at least that is the opinion of the German nobleman who keeps the Beanerie de Dispepsiary where this cantankerous and argumentative organization meet.

According to the baron proprietor, the club want a reduction on the price of meals. "Of 15 cend don't was cheap enough for roast meat mit dree kinds of dings mit it, and five cend for pie, den I shoot myself. Che, dem fellers wants roast tearkey for ten cent. Hauber I don'd care und I guess its bedder dot dey gone avay. Dey talk unt preach mit polidics unt religions und all kinds of stuff schust like crazies, holler und shout so strong dat der dishes dumble off der tables. Dey git so scared for fear dey get smashed dey smash themselves, yust like oder dam fools when dey get scared. Cost me more for crockeries den I git out of dem. Yes und I pet you yust as soon as der Demokrats members gits a machority around dot dable, dem saloon is full of 'publicans eating dinners, den dey git so mad at Democratic foolishness dat they talk, dey don'd talk low; oh no, der peoples look oud of der elevated road vinders cos dey hear dem, und dey say, 'Oh hear dot fide in Krause's ;' dot hurts me. Yes und it is just so when de Republican fellers gid de most in und dem Democratic customers, hear noting but Republican foolishness talk, den they git der ears on und by chiminey I gid crazy yust like lunatics, mit all der public gomplainds.

"Before der panixy day used to spend tirty cend, fordy cend, und vonce and vile fifty cend, che, day don't aferage twenty cend now, und by chimney dey kick all der time, dey wand palace cars mit velvet wheels for ten cend. You know what I tell 'em, yes, und I tell em to der faces, der inside is Krause's and der oudside is Pearl street. You run dot street in, but you can't run Krause's und dond you efir remember it."

It is reported in Water street that one of the members flipped a forty-cent check on the counter the other day and it startled the lady cashier so that she fainted and was sick for a week from the effects of the shock. Last year this time they had their eye on the Manhattan Club House, but Iselin got the best of them. But it was lucky for them, as the panic would have swamped them.

The refusal of Krause to cut down his hash dispepsiary prices has made a great commotion in the club; in fact, they have dropped tariff, religion, Hawaii and the balance of the earthly affairs which they used to regulate and have put all their brains to work to beat Krause and get a new hunking place.

It is reported generally that this club has secured the St. Andrew's coffee stand at the corner of Pearl and Frankfort streets, under the bridge.

In addition to its importance as an inexpensive institution the club will have a better chance to shout. To be sure the people on the bridge may be startled at times, but it cannot be helped.

They can pace up and down the walk and declaim to their hearts' content—in short, fling themselves to the winds and let it waft their eloquence from Cherry Hill to Kalamazoo. Objections were made by some of the members that it was not a good place for stormy weather, &c. But when that crowd gets excited they couldn't feel an earthquake, let alone such trivial affairs as blizzards and cyclones—objections overruled.

The only real generous man in the club is Henry Gleason. If a beggar dodges past the lynx-eyed cashier and gets to that table he is sure of a contribution and "God bless you" from Henry. As for the rest, it is not necessary to say much, but the beggar would drop dead before they would stake him. A few days ago one of these unhappy wanderers floated up to the table and Gleason, as usual, went for his First National Bank Trousers pocket, but found to his chagrin that the customary cent was missing. He explained to the miserable mendicant his unfortunate plight and in regretful tones bewailed his fate at the absence of his usual stipendiary coin that he bestows upon the worthy and unworthy beings who frequent the downtown slums. "I am sorry, my friend, for you, I can't give you any money to-day, but here are some microbes. God bles you."

ODD PLATES.

THE JACKES-EVANS MFG. COMPANY, 100 102 South Commercial street. St. Louis, Mo., have recently issued a four-page circular calling attention to the merits of the Acme wrought steel ranges which they manufacture in several styles. These goods, we are told, are constructed with a view to "economy, durability and general utility," and are "thoroughly tested and guaranteed." Among the special features to which attention is invited may be noted large oven, asbestos lined flues, swing feed door, high warming closet, water coil, drop oven door, scuttle ash pan, ventilated oven and nickel trimmings.

A SHORT TIME AGO we noted in these columns the fact that the Quick Meal Stove Company of St. Louis, Mo., had received an order for some of their goods to be shipped to South Africa. Since then the company have received another export order for Quick Meal stoves to go to Curacao, West Indies. The company have strong hopes that this order will be followed by still others of a larger nature, and that considerable business will be developed.

THE STANDARD LIGHTING COMPANY of Cleveland, Ohio, are offering the trade a new cabinet process stove, combining new features of interest and value. The stove is of attractive appearance, the ornamentation being of a neat and tasteful order. The oven is said to be the largest employed in connection with this style of stove, and is made on the company's "reflex" principle, which insures an even temperature and satisfactory operation. The ovens on the company's Nos. 3 and 4 semi-cabinets are of planished steel and asbestos lined. The oven burner is referred to as being powerful in operation and giving intense heat. The burner drums are made of brass, reinforced, and the reservoir so constructed that it can be easily taken apart for the purpose of cleaning, while the valves are readily detachable without being unsoldered. The company informs us that they are also bringing out a full line of "new process" gas stoves.

A VERY NEAT FOLDER, in imitation of a piece of birch bark, reaches us from the Boston Furnace Company of Boston, Mass. The second page of the folder is devoted to a picture of the building formerly occupied by the concern and showing workmen engaged in removing the stock to a dray and taking down the sign. Beneath the picture is the inscription "We are off with the old." The facing picture represents the new quarters of the company at 175 Hanover street and covered with signs indicating the varied assortment of goods carried in stock by the company. This picture has for a caption "We are on with the new." Between the two pictures is the statement that "The parting gave no pain."

A RECENT ISSUE of the Evansville *Courier* contains a short history of the Southern Stove Works, operated by Kiechle, Brentano & Oberdorfer, at Evansville, Ind. The changes which have taken place in the concern since its establishment in 1867 are noted, while a brief sketch of the heads of the concern forms an interesting feature of the article. It is illustrated with a general view of the building occupied by the company.

WE HAVE RECEIVED from the Quincy Steel Range Company of Quincy, Ill., a very neat four-page circular illustrating and describing the Noxall wrought steel range which they have brought out, adapted for the use of hotels, restaurants, boarding houses and private families. The oven is made extra large, the flues are asbestos lined and the high closet is made of planished steel. The arrangement of parts is such that the water front can be connected to a pressure boiler with satisfactory results. The water front is on the opposite side of the fire box from the oven, so that there is no interference with baking operations. The stove is finished in a superior style and ornamented with full nickel trimmings. It is intended for burning hard or soft coal, wood or coke and is made in several varieties.

The company state that they employ the best workmen and use the finest grade of materials in the construction of their goods.

THE NEW PLANT of the Kernan Furnace Company, at East Utica, N. Y., has been completed, and it is the present expectation of the company to have the works in full operation early in January. The business of the concern has gradually assumed such proportions as to render increased manufacturing facilities necessary, and the result is the new plant, which is fully equipped to meet the requirements of an extensive trade. A description of the new works of the company was published in these columns on March 18 of the present year.

ON THE EVENING OF DECEMBER 4 a blaze occurred in the core room of the Hart & Crouse Furnace Works, Utica, N. Y. The fire had gained considerable headway before it was discovered, and the building was nearly demolished. Fortunately, there were but few patterns and other articles of value in the structure, and the loss will not amount to over $1500, fully covered by insurance. The fire did not necessitate a shut down.

THE CHICAGO *Inter Ocean* for the 6th inst. publishes a very appreciative sketch of the industries of Mansfield, Ohio, from which the following extract is taken: "Second only in importance to the Aultman-Taylor Works comes the factory of the Baxter Stove Company, founded by Thomas Baxter, of whom, as one of the industrial pioneers, we give our readers a portrait. The works are now operated by his seven sons, who are leaders in every good word and work looking toward Mansfield's upbuilding, commercially, ethically or socially. The Baxter Stove Company manufacture 50 different styles of coal, wood and gas burning stoves, the Banner brand being known throughout the Northwest. Besides these, they make 13 different styles of gas and gasoline stoves and ranges, which, under the brand title of Monarch, have gained an enviable reputation."

AN ANNOUNCEMENT TO THE TRADE has been made by G. W. Landon, to the effect that on November 13 he was appointed by the Circuit Court permanent receiver of the William G. Fischer Mfg. Company of Kokomo, Ind., since which time he has made a careful inventory of the property. As the result of this inventory he has decided to operate the plant and use his best efforts to place the business in shape to supply customers promptly and satisfactorily with all the goods heretofore turned out by the concern named.

A CIRCULAR has been issued under recent date by George H. Barbour of Detroit, Mich., calling attention to the destitution existing in that city, and soliciting subscriptions, either in the way of money or merchandise, for the purpose of providing an adequate fund for caring for the poor and needy. The circular states that prompt attention is imperative with the conditions existing at the present time, and Mr. Barbour says that the main object in issuing the circular is to ascertain what amount can be raised and then call together the subscribers, or as many of them as can be present at a stated meeting, and appoint an executive committee, secretary and treasurer, together with such other officers as may be necessary to successfully carry on the work.

THE WROUGHT IRON RANGE COMPANY, St. Louis, Mo., are kept busy in their range department, and are averaging nearly a carload of their Home Comfort ranges every 24 hours, the shipments being made to all parts of the country. The company are also pushing their hotel ware department, and have recently sent outfits to the following hotels: R. C. Chambers & Co., *café* at Hot Springs, Ark.; Ingall's House, Bellefontaine, Ohio; Mexican Gulf Hotel, at Pass Christian, Miss. They have also shipped a large lot of copper ware to the Arlington Hotel Company, at Hot Springs, Ark.

EDWIN A. JACKSON & BRO, 50 Beekman street, New York, are one of the exhibitors at the World's Fair Prize Winners' Exposition in the Grand Central Palace, at Lexington avenue and Forty-third to Forty-fourth streets, New York. In the display is one of their well-known ventilating grates on which they received an award at Chicago. The metal work is of bronze, including fender, front, &c. This is surrounded by a tile facing, which is a combination of stone and brick work effect. The tiles are in two colors and two sizes, the whole harmonizing and showing to advantage.

EMMETT C. BAXTER, secretary and treasurer the Baxter Stove Company, Mansfield, Ohio, accompanied by Mrs. Baxter, are making an extended trip through the East, visiting New York, Philadelphia, Baltimore, Washington, D. C., and other cities. The trip combines business with pleasure, the principal object, however, being to arrange Eastern agencies for handling the new Monarch vapor and gas stoves made by the firm. While at Washington Mr. and Mrs. Baxter will pay their respects to the President and Mrs. Cleveland.

THE CARTON FURNACE COMPANY of Utica, N. Y., executed the contract for ventilating and heating the new school building in the Twelfth Ward of that place, and on December 4 the first test of the apparatus since the occupancy of the building was made. Superintendent Griffiths and Architect Gouge are reported by a local paper as being well pleased with the results of the test, and the figures presented showed that the air was changed in all the rooms in less than 15 minutes and in one room in a fraction over 7 minutes. These results are said to have been accomplished with heaters running very moderately.

THE 1893 CALENDAR issued by the Fuller & Warren Company, Troy, N. Y., met with such a gratifying reception at the hands of the trade that they have made the calendar for 1894 of the same general style. It measures nearly 11 x 14 inches in size, and is provided with a metal loop for hanging up. The heavy cardboard which forms the foundation of the calendar carries 13 sheets, measuring 8¼ x 10¾ inches, there being one for each month in the year, and one devoted to what is known as a counting house calendar. The latter gives the days of the week for 1894 and for six months of 1895. The sheets or leaves are of tinted paper, while the printing is in a deep chocolate color. We understand that the company will shortly issue advance sheets of a new warm air furnace catalogue, which will fully describe a cheap hot air heater, comprising 20 styles and sizes.

THE BELLAIRE STOVE COMPANY of Bellaire, Ohio, favor us with a copy of the supplement to their catalogue No. 2. It consists of 12 pages, and illustrates and describes the Brilliant Star range, an entirely new six-hole construction, embodying several features to which special attention on the part of the trade is invited. It has a large chute shaped feed in front, capacious fire box, thoroughly ventilated and supplied with duplex revolving grate, sectional fire walls, large ash box, cut top, heavy covers and centers, square ventilated oven, patent oven door opener and end shelf. The water in the extension tank is heated by circulating through a pipe extending lengthwise over the fire and into the tank. The Brilliant Star is made in three sizes and the usual modifications, the style of ornamentation of all being neat and effective.

THE BUCKWALTER STOVE WORKS, Royersford, Pa., will shut down on December 22, and remain closed until after the holidays.

SOUTHARD, ROBERTSON & CO., Water street and Peck slip, New York City, are offering the trade two sizes of their London furnace or double heater, which is made with or without galvanized iron casing. Its constructive features include, among others, shaking and dumping grate, dust damper, large cast iron ash pan and vapor pan. The manufacturers refer to it as being a very powerful heater and as suitable for use in stores, halls, &c.

THE CO-OPERATIVE FOUNDRY COMPANY of Rochester, N. Y., made a present of a Thanksgiving turkey to each one of their employees the day before that holiday.

SUPPLEMENTARY CATALOGUE No. 16 is being distributed by the J. D. Smith Foundry Supply Company, Cincinnati, Ohio. The supplement shows a full line of Monk's molders' solid steel tools, and includes a number of the latest shapes and sizes of handy tools suggested by practical molders. Trowels of all sorts are shown, stove tools, flanges, knives, mallets, spools, rammers and a large number of special tools for molders' use. Besides illustrations of various tools, the different sizes and the prices of each size are given in the circular.

FRANCHISES have been secured by the Schuylkill Valley Illuminating Company for the construction of an electric railway connecting Valley Forge with Spring City and Royersford, Pa, taking in Phœnixville, Harveyville, and other towns. The facilities afforded by this new road will be much appreciated by the inhabitants of that stove making district.

THE BOSTON FURNACE COMPANY of Boston, Mass., have just been settled in their new quarters in the building at the corner of Hanover and North Centre streets, with entrance at 175 Hanover street. A full line of samples of Novelty furnaces, hot water heaters, domestic ranges, Belding's New Perfection refrigerators and George M. Clark's Jewel gasoline stoves, for all of which the company are exclusive New England agents. Representatives of the Boston Furnace Company will soon visit the trade in the interests of the several lines named.

THE WAREHOUSE AND CONTENTS of the Auburn Stove Company, Auburn, Maine, were destroyed by fire on December 14, and the molding department was damaged. The total loss is estimated at $40,000, the greater part of which is covered by insurance.

THE MICHIGAN STOVE COMPANY have recently put out a most exasperating puzzle as an advertising device. It consists of a number of vertical, horizon-

tal and diagonal lines with dots at the intersections. The trick is to stick six pins in the dots so that no two of them will come on any one line. There is a solution, of course, but it is one of those things over which a man can tire his brain and fingers for hours and have the trick forever elude him. If he persists in softly saying to himself all the while "Garland stoves and ranges," he may not be assisted in solving the puzzle, but he will surely prevent himself from swearing.

THE CHATTANOOGA STOVE COMPANY, whose plant at Chattanooga, Tenn., has been idle for some time past, recently resumed operations with a force of 40 hands. We understand it is the intention of the management of the company to begin at an early date working full time with a full complement of men. A large number of orders are in hand and it is expected that business will continue to develop in sufficient volume to keep the works running the entire winter.

D. S. COOK, 171 and 173 Lake street, Chicago, heats his office and sample room with one of the Kelsey Furnace Company's corrugated warm air furnaces. The furnace is jacketed round the body, but the top is uninclosed, which enables the construction of the heat flues to be easily inspected and their operation tested. It is a novelty in the West, in which it was introduced the past summer during the World's Fair, at which the Kelsey Furnace Company had an exhibit. Mr. Cook is Chicago agent for the sale of the furnace. Preparations are also being made by him for the coming campaign in gasoline stoves. Samples of new stoves manufactured by the Baxter Stove Company, the Dangler Stove & Mfg. Company and the Standard Lighting Company have been received and are now ready for inspection on the sample room floor. Visitors to Mr. Cook's establishment will be interested in his method of illuminating. He uses gas, but manufactures it himself. A gas machine in the rear of the room furnishes a steady supply of gas from gasoline, 5 gallons of which will run 12 burners three days. Incandescent burners are used, which emit a brilliant white light, much more powerful than the ordinary illuminating gas and free from the usual annoying flicker. The gas made is not only better than the city gas, but is considerably cheaper.

WE ARE INDEBTED to the Co operative Foundry Company of Rochester, N. Y., for some advertising novelties which are intended to serve the double purpose of calling attention to Red Cross stoves and ranges and afford receptacles for matches, postage stamps, car tickets and small change. The articles are made of red leather, neatly lettered in gilt, and are of such a size as to enable them to be easily carried in the vest pocket. Upon the outside of each is a *fac-simile* of the company's trade-mark printed in old gold.

D. M. THOMAS of New York, secretary of the National Association of Stove Manufacturers, visited Chicago during the past week. The compliment of a call at our Chicago office is acknowledged.

THE DETROIT STOVE WORKS of Detroit, Mich., have just issued a circular illustrating their new stove known as the Solar Jewel soft coal base heater. The statement is made that this construction possesses a "new application of time tried and fire tested principles embodied in the first Jewel base heater for soft coal, of which more stoves have been sold since it was made a few years ago than any other stove of this class." The Solar Jewel is made in two sizes, having respectively 14-inch and 15-inch fire pots. Of the latter size the company are said to have been behind on orders, but are now caught up and can make shipments promptly. We are also in receipt from the same concern of a circular entitled "We offer only standard grades of best made stoves." It refers to the indisposition of their sales manager, said to be due to an extra amount of work in his department, and states that when he began to convalesce he confessed to his physician that one cause of his illness was a startling experience with a stove buyer during the first week in October. This experience was a conversation with a stove merchant from Illinois, who entered the sample room and after a few preliminary questions said: "Please show me the highest priced cook stove in your assortment." The sales manager did as requested and showed him the Kitchen Jewel, with the result that more than a baker's dozen were purchased. The sales manager says that in the years he has waited upon stove men he does not recall a similar inquiry, although thousands have asked him to show the "cheapest thing in the house."

Jewel Stoves.

George M Clark & Co., 153 to 161 Superior street, Chicago, are making a number of improvements in their line of gasoline stoves for the coming season. In process stoves they are bringing out a new three burner cabinet, which is exclusively a cabinet stove, having no step; also a new two-burner process stove, without the step. On all their process stoves the tank will be finished in brass, adding considerably to the beauty of the constructions. The oven burners are made considerably larger in diameter than heretofore. A removable shield protects the front tubes from the spattering of food and other causes of annoyance to tidy house keepers. This shield is decorated and makes an effective bit of decoration. It slides in and out of place. Above it has been placed a new ornament in the shape of a nickel name plate. A special feature of all the company's process stoves is the removable valve immediately under the tank. There is a separate valve for each burner, and each of these can be taken off even while baking is being done without disturbing the other valves. It can then be cleaned, which is an easy matter, and returned to its place. In generator stoves the company are bringing out a new line of 24 inch high Jewel juniors, with two and three burners; also a new line of Jewel Acmes, 24 inches high, with two and three burners. The juniors have a burner with a cut off for a low flame, and the Acmes have a quick thread direct acting burner, with a wheel for regulating the flame. All Jewel stoves and ranges, high or low, now have the Jewel lay down safety tank instead of the stationary tank. The old line of generator stoves will be continued. Improvements have been made in these by adding new ornamental doors to the No 95, and new doors, front and base to the No. 85 cabinet. The appearance of these ranges has been made much more attractive by the changes. Taken throughout, the gasoline line of this company will be far more complete for the season of 1894 than for any previous year.

Ventilation of Railroad Cars.

In speaking of the ventilation of railroad passenger cars the *Railroad Gazette* recently remarked that the greatest obstacle to improvement in this respect is the ignorance, or indifference, or both, of the passengers themselves. In any given train load of passengers there will always be some who are afraid of any suspicion of fresh air, and who will rise up against the opening of whatever apertures may be contrived for admitting fresh air or exhausting foul air; and the protests of one or two such persons in one car will generally be sufficient to overrule the wishes of those who want better ventilation, and the consequence is that all the apertures are closed at the first complaint. So, while it is not difficult to keep a car fresh by proper manipulation of the sashes in the clear stories and in the doors, general instructions for the management of these soon fall into dead letters. The irrepressible conflict between those who fear drafts and those who do not wish to die of asphyxiation is too much for the average trainman, and he soon concludes to let the whole thing go by default. The problem before the inventor is, actually, to insinuate fresh air in such a way that nobody will perceive that it is coming in, and to exhaust the foul air by equally concealed ducts. Very simple contrivances will answer, provided they are intelligently managed. What we want first is not more mechanical apparatus, but more education in the principles and benefits of ventilation.

In a case recently tried in the Supreme Court, in New York, a verdict affecting the disposal of nearly $125,000 hinged on the true definition of the little word "also." The action was brought to recover on an undertaking given by two sureties. By the defense it was contended that the complaint should be dismissed, on the ground that both sureties should have been made defendants, and that a clause of the bond on which it was sought to recover was void, because it did not contain the words "jointly and severally," as required by the code. It was admitted, however, that the first part of the undertaking did permit one of the sureties to be sued, because it contained those words. For the plaintiff it was contended that the word "also," connecting the two parts of the undertaking, carried with it the words, "jointly and severally" from the first to the second part of the bond. Dictionaries were brought into court, and after it was shown that "also" was defined as meaning "in like manner," the jury returned a verdict for the plaintiff.

Outfits for Venetian Iron Work.

A. J. Weed & Co., 106 and 108 Liberty street, New York, are placing on the market, in a popular form, materials for the construction of Venetian iron work. Suitable materials and the few necessary tools constitute the outfits obtainable from the company, by means of which, with designs and instructions, useful and artistic home decorations may be made. The construction of Venetian work is designed by the company for home work, as macramé lace making and scroll sawing have been, it being represented as an easy art to master, gratifying artistic taste, and one which may be made remunerative. It is also suggested that the construction of articles in the store or shop

during dull seasons, designed for sale over the counter, may be found profitable. For the construction of such Venetian iron work by amateurs the company furnishes materials, tools and working designs. The bracket and candlestick, as shown in Figs. 1 and 2, will convey an idea of what may be accomplished by workers in this line.

Fig. 1.—Bracket Frame.

The bracket frame or outline is furnished by the company, or may be made by a blacksmith. The company furnish iron strips of a suitable width, and these are bent and attached to the frame in any design which fancy may dictate.

Fig. 2.—Candlestick.

For candlesticks square pieces of iron are furnished for the center or backbone of the structure, and the strips are fastened to this in curves, angles or any other shapes desired. There is thus opportunity for much taste and skill. The cost of the materials for the candlestick shown, with the shade, shade holder and extinguisher—these three articles being furnished ready made—is 87 cents. It is estimated that about two hours' labor would be required for the construction of the article. These particular designs are only referred to by way of illustration and it is obvious that a large variety of articles can be made according to the taste, ingenuity and skill of each individual.

The materials necessary for this work, as furnished by the company, include strips of Russia iron, copper, brass and aluminum of different widths. These can be obtained in packages or made up into primary designs, as shown in Fig. 3, at a cost of from 10 to 15 cents per dozen.

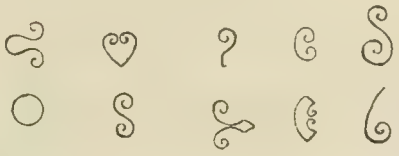


Fig. 3.—Machine Made Primary Designs

The copper, brass and aluminum strips may be combined in designs to advantage by advanced workers either from working patterns or from original designs. Strips of the various metals are also furnished twisted, fluted, in Grecian borders and in other designs.

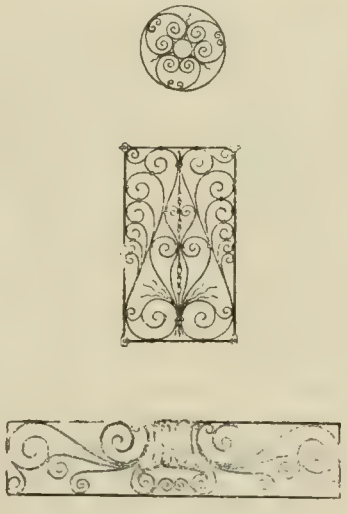


Fig. 4.—Wrought Iron Frames.

Those desiring wrought iron frames similar to those shown in Fig. 4 for windows, doorways, &c., for filling in with designs, or frames for brackets, fire screens, lanterns, &c., can obtain them in regular sizes, or frames will be forged to order from designs submitted. Working designs from which articles can be made are furnished separately, or at an annual subscription of $1 two full sized working drawings will be furnished each month. The tools required for this work are few and simple and will be furnished by the company if desired. In the construction of the different articles the strips of metal or machine made designs are fastened together with binders furnished by the company at from 5 to 15 cents per 100, according to the metal of which they are made. These are fastened by means of the binder tool shown in Fig. 5.

Fig. 5.—The Weed Binding Tool.

The standard of the binder tool is of machinery steel, case hardened, and the working parts are of tool steel. The binders, properly put in place with the tool, impart firmness to the article constructed. Black antique paint, furnished by the company, is used to paint the iron work after the article is completed, to give it a finished appearance.

For the convenience of customers the company put up the necessary tools and materials for making Venetian iron work in sets, varying in completeness according to the needs of the purchaser. There are three sets or outfits thus put up, known as A, B and C. Set A is the beginners' outfit and sells for $3.50, and contains all that is really necessary. In set B the tools are of a better grade, costing $6, and in addition there are several other appliances which will be found convenient, besides a greater amount of materials to work with. In set C the tools are of the best quality and everything as complete as the company's experience has made possible. This set costs $10. The following is the list, with prices, of tools and materials in set B, which is sold for $6, this being a representative outfit:

The Weed Binding Tool, for vise, with separate base	$1.25
The Weed Forming Tool	.25
Vise	.50
Iron Shears	.50
Cutting Plier	.60
Square Nose Plier	.30
Round " "	.40
Tape Measure	.10
Antique Paint	.50
Paint Brushes, per set, 3	.20
2 Hooks	.30
2 Backbones for Candlesticks	.30
Bracket Frame	.35
Package of Iron Strips, ¼ inch	.20
" " " " ⅛ inch	.05
" " Brass Strips, ¼ inch	.10
" " Iron Binders for ¼ inch.	.05
" " " " " ⅛ inch.	.05
Sample of Brass Binders for ¼ inch.	.05
Wire, per spool, Iron	.05
" " " Brass	.15
6 Spring Clasp Pins	.30
2 Candlestick Bobechés	.10
2 Extinguishers	.25
2 Candle Shades	.50
2 Extension Shade Holders	.35

The point is made that there is almost no limit to the kinds of articles and designs which may be constructed with the tools and materials obtainable; and that these outfits would form an attractive addition to the line of holiday goods for sale in Hardware stores. Samples of ready made articles may be obtained from the company for display.

With the object of acquiring an unobstructed outlet to the lakes, the Pennsylvania Railroad Company have secured a controlling influence in the Toledo, Peoria & Western Railroad. This will largely facilitate the business of the Pennsylvania Company in Northern Indiana and Illinois.

TRADE REPORT.

The Iron Market.

A heavy increase in the production of Pig Iron is shown in the monthly statistics; and this, together with the known fact that since the beginning of the month there have been further additions to capacity, simply emphasize the growing supremacy of the Central West. The increase in question is due almost entirely to the resumption of plants connected with rolling mills and Steel works, who are capturing nearly every order of consequence from the Atlantic Ocean to the Mississippi. In their fierce struggle for business they are making prices that even two months since would have been thought impossible. Even with the lowest basis for raw material the figures accepted for finished material, apparently without hesitation or keen regret, by the Pittsburgh and the surrounding districts leave rival producers unable to account for them. Low as they are, our quotations in the leading markets are nominal. All important business is done at material concessions.

If there were any evidence that the low sellers are filling up there might be some hope for the near future, but thus far there is no indication that any of the hungry giants are even temporarily gorged. One by one the weaker mills are withdrawing to await better times.

There has been some recent breaking in prices lately in the Cast Iron Pipe trade, the Jersey City contract for about 2500 tons going at $19.50 ℔ ton, delivered, while the Washington business was also taken at very low prices. One of the leading authorities in the trade does not take a cheerful view of the future, fearing even greater demoralization.

Pig Iron.—The New York market is quiet, some sellers reporting it particularly dull, while others note heavier shipments. It is probably true that more Pig Iron is being melted than for some time since. We quote: Northern brands, $14 @ $15 for No. 1; $13 @ $14.25 for No. 2, at tidewater. Southern Iron, same delivery, $13 @ $14 for No. 1; $12 @ $13 for No. 2; $11.50 @ $12.25 for No. 3; $11.75 @ $12.25 for No. 2 Soft, and $12.25 @ $12.50 for No. 1 Soft.

The Philadelphia market is extremely dull, and while there are no evidences of large offerings, such demand as there is can be readily met at former quotations. The talk of an advance is certainly premature so far as this market is concerned, although if there was anything like an average demand it is not unlikely that an upward tendency would be developed. For the time being the supply is full and ample, and to secure better prices a larger consumption is indispensable. Prices for Philadelphia and near by points are about as follows:

No. 1 Foundry	$13.75 @ $14.25
No. 2 Foundry	13.00 @ 13.25

Chicago advices report that local Coke is moving rather steadily in small lots for quick delivery, but there is almost no inclination among buyers to place contracts for future delivery. Some figuring is being done, but it is simply owing to consumers keeping themselves posted. Stocks at local furnaces will last for a month or two more at the present rate of shipment, so that there is no immediate prospect of additional furnaces being blown in in that district. Some few sales have been made of Southern Coke, but trade generally has been extremely dull, and even the carload business has dropped to very small proportions. The leading companies are maintaining prices at the rates named last week, but some of their competitors are taking business at lower figures. Quotations are now as follows for cash:

Lake Superior Charcoal	$15.50 @ $16.00
Local Coke Foundry, No. 1	13.50 @ 14.00
Local Coke Foundry, No. 2	12.75 @ 13.00
Local Coke Foundry, No. 3	12.25 @ 12.75
Local Scotch	14.00 @ 14.50
Ohio Strong Softeners No. 1	15.50 @ 16.00
Southern Silvery, No. 1	@ 13.75
Southern Silvery, No. 2	@ 13.25
Southern Coke, No. 2	12.15 @ 12.40
Southern Coke, No. 3	11.65 @ 11.90
Southern, No. 1, Soft	12.40 @ 12.65
Southern, No. 2, Soft	11.65 @ 11.90
Tennessee Charcoal, No. 1	16.00 @ 16.50
Alabama Car Wheel	18.25 @ 18.50
Jackson County Silvery	16.00 @ 16.50
Other Ohio Silvery	15.00 @ 15.50

With the approach of the close of the year, the demand for Pig Iron in the Pittsburgh district grows smaller, and in addition consumers are requesting postponement of shipments to an alarming degree. Buyers of Pig Iron say they can see no indications of the market toning up, and until they do they will continue to buy only as necessity requires. Makers are not able to offer any arguments to offset these statements, and it is the impression that an improvement in the Pig Iron market will not come for some time. Foundry Iron is falling off in demand and prices are lower. The market in general is thought to be in a very unsatisfactory condition, and the outlook very discouraging. Quotations are given as follows:

No. 1 Foundry	$12.00 @ $12.50	cash
No. 2 Foundry	11.00 @ 11.50	"

There has been a light volume of business in Pig Iron during the week in the Southern markets, and while price are not quotably lower, there was not enough done to really test the tone of the market. There is no urgency to sell, because the larger Southern Iron companies have recently sold so liberally that they are disposed to hold off for a time. There is much melting of Iron in progress by Iron Pipe works, and there are some contracts in sight for Pipe which may keep this up. The present situation of the trade appears to be no worse. But there are apprehensions of what may occur from the operations of the new tariff. There is some inquiry for Charcoal Iron, but it is not large. Quotations are as follows:

Southern Coke, No. 1	$12.25 @ $12.50
Southern Coke, No. 2	11.00 @ 11.25
Southern Coke, No. 3	10.50 @ 10.75
Ohio Soft Stone Coal, No. 1	15.50 @ 16.00
Ohio Soft Stone Coal, No. 2	14.50 @ 14.75
Lake Superior Coke, No. 1	15.00 @ 15.25
Lake Superior Coke, No. 2	14.00 @ 14.25
Hanging Rock Charcoal, No. 1	18.50 @ 19.00
Hanging Rock Charcoal, No. 2	17.50 @ 18.00
Tennessee Charcoal, No. 1	14.00 @ 14.25
Tennessee Charcoal, No. 2	13.00 @ 13.25
Standard Southern Car Wheel	17.75 @ 18.00
Lake Superior Car Wheel and Malleable	17.00 @ 17.25

Metal Market.

Pig Tin.—Prices have dropped off 15¢ @ 20¢ ℔ 100 lb. The decline is not easily explained except on the supposition that the load carried by leading holders is more than can conveniently be taken care of at the moment. In other words, the lack of any considerable "short" interest in the speculative branch of the market and very conservative buying on the part of jobbers and consumers leaves solid facts of a weighty nature to be wrestled with. Manipulation is extremely difficult in the face of the situation in London and the uncertainty connected with pending American tariff legislation. Some little business has been done on Metal Exchange contracts at 20.45¢, December delivery, and "outside" sales were said to have been made relatively as low, or say 20.50¢, cash, for 5-ton lots. Ordinary jobbing business is on strictly conservative lines, and prices for small lots are inclined to be weak.

Copper.—The market is quite as complicated now as it was a week ago, with the line of quotations somewhat lower. Contracts for Lake Superior Ingot have been sold on the Metal Exchange at 10.35¢ and at 10.30¢, January delivery. Some lots of actual Copper have been offered on the open market at 10⅜¢, and it would appear that purchases may yet be made at the latter price, in the face of the strong position assumed by leading producers and certain influential

operators. Similar irregularity exists as to market value of other varieties. The market is thus in somewhat uncertain form at the moment, and rather dull. The consumptive demand is on an exceedingly moderate scale, dealers reporting a very restricted business in both Ingot and Sheet Copper. Prices for small lots of the former are generally maintained at 11¢ ℔ lb for Lake Superior and 10¼¢ for Ansonia grade Arizona.

Pig Lead.—There has been hardly any business, and efforts in the direction of working up deals have been slimly rewarded. In fact, not only speculative sentiment, but good intentions of operators, seem to have been set aside by uncertainties connected with the new tariff bill. Such as it was, the business has been on a rather lower level of prices—say 3.20¢ @ 3.25¢ for ordinary Western brands for shipment during the balance of the year. Correspondingly low figures were said to have been quoted from leading Western centers. Consumers show little or no interest either in Pig or Manufactured Lead, the jobbing trade in these products being for the time practically dead. The price asked for retail quantities of American Pig is about ⅛¢ lower than former quotations, namely 4¢ @ 4⅛¢.

Spelter.—The local market is almost stationary. There are hardly any orders and the offering is exceedingly tame, with some suggestion that producers are slow to accept orders at current prices. For the present 3.80¢ @ 3.85¢ may fairly be quoted on ordinary Western brands, prompt or near future shipment, with an advance of from ⅛¢ to ¼¢ on small lots, according to circumstances. Choice brands bring about the usual premium.

Tin Plate.—Business has been extremely tame in the Tin Plate market, and is likely to continue so until after the turn of the year, as consumers are generally unwilling to purchase, unless for absolute necessities, at this season, when they are usually engaged in stock taking and adjusting their accounts for the new year. Moreover, uncertainties connected with the tariff have a restraining influence upon ventures in futures. Nothing beyond small orders for spot goods comes in; and the market, upon the whole, shows a weaker tone. Prices for jobbing quantities rule at about the quotations of the past few weeks, but concessions are, perhaps, more easy to obtain.

Sheet Iron.—The trade in both Black and Galvanized Sheets is of the narrowest and most perfunctory character. Prices are difficult to quote, as manufacturers and dealers alike are usually willing to meet purchasers with substantial cuts in the quoted rates in order to get business.

THE SHEET MILLS of the Joliet Sheet Steel Rolling Mill Company, Joliet, Ill., remain idle. It is understood that it is the intention of the directors to lease the mills if suitable terms can be arranged.

Chicago Report.

Scrap.—The demand for Old Material is fair, and Wrought Scrap is a little firmer, as the supply seems to be less plentiful. Dealers furnish the following list of buying prices, Chicago delivery:

	Per net ton.	Per lb
No. 1 Wrought Scrap	$7.00	....
Machinery Cast	7.00	....
Malleable Cast	6.00	....
Stove Plate (free of burnt)	5.00	....
Burnt Iron and Grate Bars	3.50	....
Sheet Iron and Hoops	2.00	....
Plow Steel and Breaking Stock	5.50	....
No. 2, such as Shovels, Hoes, &c	4.00	....
Old Boilers—whole (Iron)	4.00	....
" (Iron)—cut in single Sheets and Rings	6.00	....
Old Gas-Pipe and Boiler Tubes	5.00	....
Cast Borings	3.25	....
Turnings	4.00	....
Horseshoes	7.00	....
Copper Bottoms	....	5 ¢
Copper Clips and Heavy	....	7 ¢
Heavy Brass	....	5⅛¢
Light Brass	....	3⅛¢
Pipe Lead	....	2⅛¢
Tea Lead	....	2 ¢
Zinc	....	2 ¢
Rubber	....	4 ¢

Anthracite.—The movement is not so large as it has been, and dealers are somewhat disappointed that the consumption does not increase with the continuous cold weather. Carload lots of 12 net tons or over are quoted as follows:

	Grate.	Egg, Sto. and Ch.
Chicago, Ill	$5.85	$6.10
Milwaukee, Wis	5.85	6.10
Kansas City, Mo	9.05	9.30
Council Bluffs, Iowa	9.05	9.30
Lincoln, Neb	9.20	9.45
Sioux City, Iowa	9.05	9.30
Aberdeen, S. Dak	9.10	9.35
Dubuque, Iowa	7.15	7.40
Madison, Wis	7.35	7.60
St. Paul, Minn	8.35	8.60
Burlington, Iowa	7.35	7.60
Des Moines, Iowa	8.80	9.05
Davenport, Iowa	7.15	7.40
St. Joseph, Mo	9.05	9.30
Leavenworth, Kan	9.05	9.30
Omaha, Neb	9.05	9.30

Colorado Anthracite.

COLORADO FUEL & IRON COMPANY.

Denver	$8.00
Pueblo	8.00
Colorado Springs	8.00
Leadville	8.00
Cheyenne, Wyo	10.00
All points between Denver and Missouri River	8.85

THE NUBIAN IRON ENAMEL COMPANY of Cragin, Ill., report their sales of Nubian in small packages almost up to former years, notwithstanding the dullness in general trade. As an evidence of the manner in which tariff agitation disturbs trade in almost unexpected quarters, the company state that they have many customers among manufacturers whose products are affected by the provisions of the Wilson bill, and who will not buy until some definite decision is made by Congress. One customer, for example, is a manufacturer of cotton ties, who uses from eight to ten carloads of Nubian Enamel annually. As cotton ties are scheduled to go on the free list, it is not remarkable that this customer is not buying materials. Others are not hit quite so hard, but prefer to wait to see exactly where they will stand, and meantime the sales of Nubian as well as other materials must suffer.

CONDITION OF THE

Hardware Trade.

THE middle of December usually witnesses a falling off in the demand for goods and a gradually diminishing volume of business. The present year is no exception, and some special causes are operating to make the aggregate of sales even lighter than usual. In view of the condition of trade more than the usual number of travelers have returned home and are waiting until their efforts will be rewarded by a larger measure of success. The trade, however, on the whole is still being canvassed pretty thoroughly. The conservatism which has characterized business during the past few months is still the policy of merchants, who are limiting their purchases as much as possible until they have taken stock and ascertained the results of the year's or half year's business. At the present time the uncertainty with reference to the action of Congress in the matter of tariff legislation is also having a marked effect and buyers are waiting until this matter is definitely settled. There is, however, a good deal of business doing in a small way, as stocks in the hands of both retailers and jobbers are in most cases more or less broken. There is also a fair activity in seasonable goods and some late orders for articles for the holiday trade help to swell the aggregate of business. Some large buyers have deferred much longer than usual the placing of their orders for the spring trade, and a good many of them are still holding off. The unsatisfactory condition of the market in the matter of prices, especially in staple goods, has not a little influence in deterring merchants from purchasing at this time. While the volume of business is thus only moderate, it is gratifying to note the constant improvement in the financial condition, justifying the expectation that with an early resumption of activity in mercantile circles there will be a satisfactory spring trade. It is especially a matter for congratulation that Hardware merchants throughout the country have so well stood the financial strain of the past few months, and it is hoped that with the turn of the year there will not be many failures to report.

Advices from Chicago.—The steady winter weather of the past fortnight has enlivened business somewhat in the Shelf Hardware line. It has especially improved collections. The prevalence of snow throughout the Northwest has enabled farmers to market a great deal of their produce and in this way has undoubtedly made money much easier in purely agricultural districts. The movement, however, has not extended to all classes of the Hardware jobbing trade. Manufacturers of Tinware are exceptionally dull. The inventory season is always expected to be of this character, but much less is doing this year than in

previous similar periods, and a revival of demand is not expected now until considerably after the turn of the year. The heavy Hardware jobbers also report their business quiet, except in Sleigh stock, which is in particularly good demand and to some extent makes up for the dullness in other departments.

Notes on Prices.

Wire Nails.—With the advance of the season and the approach of the holidays there is a falling off in the volume of business, but the fact that stocks in dealers' hands are limited is evidently compelling a good many houses to purchase in larger or smaller quantities for a supply of their immediate requirements. Manufacturers also report more inquiry in regard to terms for shipment of fair assortments early in the year, but jobbers and other large purchasers are quite generally deferring placing their orders. Careful attention is, however, given to the market, and buyers are watching it closely and are preparing to place their orders at the first indication of a turn in the matter of prices. This point, however, has not as yet been reached. Notwithstanding the fact that quotations which have ruled for the past few weeks have been regarded as abnormally low the market has developed a further weakness and some sales have been made at slightly lower figures than were regarded as the extreme prices a week or ten days ago. The market is represented by the quotation of $1.15 for carload lots at mill, but attractive orders could without doubt be placed at a slight concession from this figure.

Advices from Chicago.—Some manufacturers of Wire Nails are booking orders for good quantities, although the volume of business is by no means so large as that of November. The current trade is, however, not generally distributed, and some concerns complain of a dearth of orders and expect to close down their factories at an early day, not to resume operations until some time in the new year. Prices are irregular, the nominal quotation continuing at $1.30, Chicago, but it is a comparatively easy matter to secure better terms from some of the manufacturers who are eager for business. The spot cash sellers are again making their appearance to some extent. Jobbers quote small lots from stock at $1.35 to $1.40.

Cut Nails.—The Cut Nail market is sluggish and rather weak, being affected by the same influences as Wire Nails. There is some irregularity in the quotations of the different mills, but in the East the market is represented by 90 cents for carload lots at mill, a figure from which concessions are made by some of the manufacturers. There are, however, others who are endeavoring to obtain a slightly better figure. Small lots from store in New York are quoted regularly at $1.20.

Advices from Chicago.—The Cut Steel Nail trade is quiet and is expected to become more so as the end of the year approaches. Prices are maintained at $1.15 to $1.20, Chicago, according to the character of the order. Small lots from stock are selling at $1.25.

Barb Wire.—The Barb Wire market continues in an unsatisfactory condition, both as regards the volume of business and prices. The demand is referred to as sluggish, and most of the mills report the aggregate of orders as small. Prices have receded slightly below the point at which they have been held for a few weeks, and the market is now represented by the quotation of $2.10 to $2.15 for carload lots of Four-Point Galvanized at mill.

Advices from Chicago.—A great deal of business has been placed recently by manufacturers of Barb Wire with jobbers in the West and Northwest for spring delivery. Prices appear to have been well maintained, owing to the noticeable conservatism of some manufacturers who have usually competed actively for business in this territory. Prices may, therefore, be quoted at $2.35 to $2.40 for factory lots of Galvanized, and $1.95 to $2 for Painted. Jobbers continue to quote small lots from stock at $2.55 for Galvanized, but report that manufacturers are more and more absorbing the retail trade

Cordage. — The manufacturers of Cordage report a light demand, buyers refusing to place orders in excess of their immediate requirements. We have to record a still further decline in the price, the following prices being obtainable on large lots, f.o.b. factory or New York : Manila, 7¼ cents; Sisal, 5 cents, and New Zealand, 5 cents. The competition between the different manufacturers continues active. The matter of the reorganization of the National Cordage Company is reported to be progressing satisfactorily, and steps are being taken to consummate the purchase of the plants and property of the National Cordage Company by the Reorganization Committee as trustees.

Cistern and Well Cover.—The Safety Cistern and Well Cover, manufactured by Menefee & De Vilbiss, Fort Wayne, Ind., is sold at a discount of 35 per cent. from the following list:

Size of cover.	Each.
36 inches	$3.85
38 "	4.15
40 "	4.65
43 "	5.50

Glass.—No new or interesting features have developed in connection with the Glass trade during the past week. No improvement in demand is noticed, and such orders as are received are for limited quantities for immediate use. There is a disposition on the part of some of the manufacturers who have not as yet started up their works to postpone immediate resumption. Prices at the present time are so uncertain that it is difficult to name quotations that will stand good under all circumstances. Local prices on American Window Glass are referred to as ranging from 80 and 20 to 85 per cent. discount, according to quantity. Pittsburgh prices are reported as being from 85 and 5 to 85 and 10 per cent. discount, while it is understood that Western factories are making still lower prices. Plate and imported Glass show no change in demand or prices.

Old Metals.—The demand for Old Metals is tame, and holders are not inclined to push their material on the market at the present low prices. The firmness is Copper has induced dealers to raise the price ⅛¢ ℔ lb, but the prices for other descriptions of Old Metals remain unchanged. The demand for Scrap Iron continues slow, and although offerings are not heavy, prices remain weak. Quotations are about as follows, delivered in New York:

Heavy Copper	℔ lb	7¢
Light and Tinned Copper	℔ lb	6½¢
Heavy Brass	℔ lb	5¢
Light Brass	℔ lb	4½¢
Lead	℔ lb	3¢
Tea Lead	℔ lb	2¾¢
Zinc	℔ lb	2½¢
No. 1 Pewter	℔ lb	14¢
No. 2 Pewter	℔ lb	6¢
Wrought Scrap Iron....℔ gross ton	$7.00 @	$8.00
Heavy Cast Scrap....℔ gross ton	8.00 @	9.00
Stove Plate Scrap....℔ gross ton	4.00 @	5.00
Burnt Iron, ℔ gross ton	2.50 @	3.00

Old Rags, Paper, &c.—Business in these materials is very quiet. Mills are not eager to take Paper Stock, except at the lowest prices, and then only in moderate quantities. The following quotations represent the usual price paid by dealers in New York:

No. 1 White Rags	℔ lb	3¼ @	3½¢
No. 2 White Rags	℔ lb	2¼ @	2⅝¢
Mixed Rags	℔ lb		3¼¢
Blues and 3ds	℔ lb	1 @	1¼¢
Hard Sized White Shavings	℔ lb	2¼ @	2⅝¢
No.1 White Book Shavings	℔ lb	2 @	2⅛¢
No.2 White Book Shavings	℔ lb	1 @	1⅝¢
Light Book Shavings	℔ lb		¾¢
No. 1 Mixed Shavings	℔ lb	¾ @	1 ¢
No. 2 Mixed Shavings	℔ lb	½ @	¾¢
No. 1 Printed Books	℔ lb	1 @	1¼¢
Ordinary Mixed Books	℔ lb	½ @	¾¢
Newspapers	℔ lb	½ @	3-5¢
No. 1 Manila Paper	℔ lb	1 @	1⅛¢
No. 2 Manila Paper	℔ lb	⅝ @	¾¢
Bogus Paper	℔ lb		½¢
Common Paper	℔ lb	⅜ @	½¢
Straw Chips	℔ lb	½ @	⅝¢
Binders' Clippings	℔ lb	½ @	⅝¢
Jute Butts	℔ lb	1⅞ @	2 ¢
No. 1 Jute Bagging	℔ lb	1 @	1¼¢
Mixed Bagging	℔ lb	¾ @	1 ¢
No. 2 Bagging	℔ lb	½ @	¾¢
Hemp Twine	℔ lb		2¼¢
Manila Rope	℔ lb		2½¢
Jute Rope	℔ lb	1½ @	1¾¢
Mixed Rope	℔ lb	¾ @	⅞¢

Old Rubber.—The market for this material is narrow and weak. Prices in New York are about as follows:

Car Springs, ton lots, ℔ lb.	@	$0.03¼
Rubber Shoes, carloads, delivered at factory, ℔ lb.	@	.03
Rubber shoes, less than carloads, ℔ lb. 0.02¼	@	.03⅛
Large Hose, ℔ ton	@	9.00
White Wringer Rolls, ℔ lb.	@	.04¼
White Syringes, ℔ lb.	@	.05

THE SHEET AND PUDDLING MILLS of the Cleveland Rolling Mill Company, Newburg, Ohio, which have been shut

down since July 1, have started up. A reduction of 12 per cent. from the old scale went into effect.

Trade Notes.

WILLIAM J. H. GLUCK, Baltimore, Md., sends out a circular to the trade asking them to forward their orders direct by mail, as he will not have any salesmen out for 60 days, and a reduction of prices will be made on the saving in their traveling expenses. Accompanying the announcement is a sheet giving a list of Sheet Metal Goods on which special prices are made, the quantities of the articles and the prices being presented.

ATTENTION IS CALLED to an advertisement in this issue offering for sale an old established heating, plumbing and stove business, located in one of the best business cities in Vermont.

THE HEATH & MILLIGAN MFG. COMPANY of Chicago have just issued a very pretty *brochure* entitled "Hints on Exterior Decoration." It consists of 24 pages, bound in stiff paper covers, with an illuminated title, in which practical directions are given to builders or owners how to select colors and secure pleasing and tasteful combinations in painting the exteriors of houses. The following extracts from the introductory remarks show how the subject is treated: "It is important that one should know what colors will harmonize either in resemblance or by contrast." "A harmony in resemblance is obtained by a graduation of tints; a harmony by contrast is in the use of opposing colors." "If a dwelling has a brick or stone foundation it should be painted darker than the body of the house to give it the appearance of solidity and strength." "A dark color used on window sashes gives the window glass a much cleaner and brighter appearance than lighter colors." After a few pages of such hints there are 18 pages devoted to as many different combinations of colors, in which the actual tints are shown for trimming, body and sash. Each combination is accompanied by descriptive remarks, giving artistic reasons for the selection made. Attention is called to the excellence of the Paints prepared by the company for all classes of work.

THE LARGE PLANT of the Ætna-Standard Iron & Steel Company, at Bridgeport, Ohio, has not been in operation to full capacity at any time since last July. Last week at this plant there were ten sheet mills, two guide and one bar mill in operation, but how long these departments will continue running depends altogether on the receipt of orders. For some time this firm have made it a practice to operate such parts of their works as they have orders for, and on the completion of specifications in hand close down their mills for further accumulation.

NEW YORK WIRE CLOTH COMPANY, New York office 280 Broadway, have about completed additions to their York, Pa, works, made necessary by the total destruction of one of their factories at Hamilton, N. Y., June 2 last. The machinery is of the newest models and most improved kind, and in operation will double the capacity of that plant. They estimate that, based on ten hours each for 300 working days, they will be able to produce 25,000,000 square feet of Wire Cloth per year.

LAST WEEK the report of W. C. Hine, receiver of the Youngstown Stamping Company, Youngstown, Ohio, was filed in court. The report shows that from February, 1893, to May, 1893, $12,911 was received and $12,335.28 paid out; in May $20,263.78 was received and $19,966.09 paid out; in June $11,983.65 was received and $12.377.70 paid out; in July $7402.77 was received and $7588.14 paid out; in August $7943.65 was received and $7039.34 paid out; in September $7402.88 was received and $7721.32 paid out. This leaves balance on hand, October 31, $889.11.

AUGUST KREAMER, manufacturer of pieced and stamped House Furnishing Goods, South Third street and Kent avenue, Brooklyn, has bought the plant of Peter Michels of that city, for making Coffee and Tea Pots and a general assortment of Tinware. This will be incorporated with his own factory, and to provide the necessary room he recently added two new stories on the South Third street wing, giving an increased floor space of 6000 square feet. He is about to commence the manufacture of a line of heavy planished ware of four, five and six cross tin, supplementing a large assortment of goods already long made by him. This will include Chafing, Vegetable and Oyster Dishes, Urns, Tureens, Egg Coddlers, Rice Molds, Butter Kettles, Coffee and Tea Pots, &c. The goods made at this factory are mainly for fine trade, and, when so ordered, have the dealer's name struck in brass affixed to each piece. A full line of culinary and housekeeping ware of heavy tin, copper, sheet iron plain, galvanized, japanned and decorated is already well known to most of the largest dealers and department stores. A new catalogue, for a long time in preparation, will be issued in about two months.

CLEMENT & DUNBAR, 1129 Beach street, Philadelphia, Pa., are calling the attention of the trade to their Home and Rapid Ice Cream Freezers. The Home is a single action Freezer with an automatic adjustable scraper and white cedar tub. The Rapid is a double action Freezer with a tub large enough to allow of covering the can completely with ice without interfering with the working parts. The can, of heavy tin plate, has a solid iron cover and bottom, and is fitted with an automatic scraper which adapts itself to any difference in the surface of the can. At the bottom of the tub is a screw which raises the can, when required, sufficiently to compensate for any sag in the can, or wear in the bearings. It is claimed that the tubs are all full sized and allow of large lumps of ice being used, thus tending to hasten the process of freezing and minimize the labor incident to same. The firm are also makers of the Rapid Ice Breaker, designed for confectioners, hotel keepers, and all who use large quantites of broken ice.

ANNOUNCEMENT is made that Manley W. McClure has retired from the firm of Brown, McClure & Wales, Boston, Mass. The business of importing and dealing in Iron, Steel, Heavy Hardware and metals heretofore conducted under the above firm name will hereafter be continued by John G. Brown and William Q. Wales under the style of Brown & Wales.

HERMAN AICH, 43 Murray street, New York, is sole agent in this country of Arthur Krupp, Berndorf, Austria. At this place are extensive works, employing, it is stated, 3500 persons, manufacturing a large line of pure nickel Cooking Utensils. While well introduced abroad, they are said to be virtually new in this market. The utensils are all seamless and guaranteed absolutely pure nickel, also acid proof. Unlike copper goods of this character, they are always ready for use, while the former must at times be retinned. With ordinary care they are said to be practically indestructible. Probably they will first be used in hotels, restaurants, clubs, institutions, &c., as upon the recommendation of chemists, metallurgists and physicians they have been largely introduced abroad in such places. They are especially recommended for hospitals or wherever food is prepared for invalids. The ware is perfectly smooth inside and has a mirror polish outside, resembling in this respect silver ware. The variety of utensils include hotel deep, medium and shallow Sauce Pots, Stew, Frying and Dripping Pans, Egg Cookers, Fish Boilers, Trays, Cups, Tureens, Gravy Boats, &c., many of the leading articles being made in from 20 to 60 sizes each. A line of the principal goods and sizes will be carried here in stock, while importation orders can be taken for anything on the list. The manufacturer is the brother of the famous gun maker of Essen, Germany.

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Metal and Miscellaneous Prices.

CHICAGO, DECEMBER 14, 1893.

Tin—

Straits pigs.....23¢

Imported Tin Plates—

Charcoal Plates.—Bright.

Guaranteed Plates command special prices, according to quality.

		Per box.
Calland and Melyn Grade	IC, 10 x 14	@ $6.75
	IC, 12 x 12	@ 6.75
	IC, 14 x 20	@ 6.75
	IC, 20 x 28	@ 13.50
	IX, 10 x 14	@ 8.75
	IX, 12 x 12	@ 8.75
	IX, 14 x 20	@ 8.75
	IX, 20 x 28	@ 17.50
	DC, 12½ x 17	@ 6.50
	DX, 12½ x 17	@ 8.50
Allaway Grade,	IC, 10 x 14	@ 6.50
"	IC, 12 x 12	@ 6.50
"	IC, 14 x 20	@ 6.50
"	IC, 20 x 28	@ 13.00
"	IX, 14 x 20	@ 8.00
"	IX, 20 x 28	@ 16.00

Coke Plates—Bright.

	Per box.
Steel Coke—IC, 10x14, 14x20	$5.75 @$5.85
IC, 14x20, 90 lb	5.50 @ 5.60
IC, 14x20, 100 lb	@ 5.85
10 x 20	8.75 @ 9.00
20 x 28	11.50 @12.70
'X, 10x14, 14 x 20	@ 7.35
B.V. Grade. IC, 10x14, 14x20	5.85@ 6.00

Charcoal Plates.—Terne.

Guaranteed Plates command special prices, according to quality.

Mansel and Dean Grades.—	
IC. 14 x 20	@ $5.62½
20 x 28	@ 11.25
IX. 20 x 28	@ 14.25
Worcester Brand and equal.—	
IC, 14 x 20..	6.12½@ .....
IC, 20 x 28..	12.25 @ .....
IX, 14 x 20..	7.62½@ .....
20 x 28..	15.25 @ .....

American Tin Plates.

Charcoal Plates.—Bright.

Irondale, A. A.—IC, 14 x 20	$7.00
" " IX, 14 x 20	9.00
" " IXX, 14 x 20	11.00
" " IC, 20 x 28	14.00
" " IX, 20 x 28	18.00
" " IXX, 20 x 28	22 00
Florence.—	
IC, 10 x 14, 12 x 12, 14 x 20..	$6.75
IX, 10 x 14, 12 x 12, 14 x 20..	8.50
Palma.—	
IC, 10 x 14, 12 x 12, 14 x 20..	$7.25
IX, 10 x 14, 12 x 12, 14 x 20..	9.25
Each extra cross $2.00 and 20 x 28 double these prices.	
Brilliant, Tissue Packed, IC, 14 x 20.	$9.25
Royal ,extra, IC, 14 x 20	7.25
Merlon, IC, 14 x 20	7.00
Almond, IC, 14 x 20	6.50
Mint, IC, 14 x 20	6.25

Coke Plates.—Bright.

Elwood.—IC, 14 x 20	$6.00
" IC, 20 x 28	12.50

Roofing Plates.

Arch, IC, 20 x 28	@$11.75
Crescent, IC, 20 x 28	@ 12.25
Crescent, IX, 20 x 28	@ 15.25
Empire, IC, 20 x 28	@12.50
Empire, IX, 20 x 28	@15.50
Hickory, IC, 20 x 28	@ 12.75
" IX, 20 x 28	@ 15.75
Alaska (heavily coated), IC, 20x28	@$14.50
Alaska IX, 20 x 28	@ 17.75
Special, IC, 20 x 28	@ 15.50
" IX, 20 x 28	@ 18.50
Merchant's Roofing (extra coated), IC, 20 x 28	@$17.75
Merchant's Roofing (extra coated), IX, 20 x 28	@$21.50
Merchant's Old Method, (extra heavily coated), IC, 20 x 28	@$19.75
Merchant's Old Method (extra heavily coated), IX, 20 x 28	$23.60
Irondale A:	
IC, 14 x 20	$6.25
IX, 14 x 20	7.75
IC, 20 x 28	12.50
IX, 20 x 28	15.50
Westmoreland:	
IC, 14 x 20	$6.25
IC, 20 x 28	12.50
Elwood:	
IC, 20 x 28	$12.00
Juno:	
IC, 14 x 20	$5.75
IC, 20 x 28	11.50
Illinois, Old Method:	
IC, 20 x 28	$17.00
E. L.:	
IC, 20 x 28	$12.50
Jessie:	
IC, 20 x 28	$12.00
Scott's Extra Coated, Stamped and Resquared, IC, 14 x 20	$9.50
Scott's Extra Coated, Stamped and Resquared, IX, 14 x 20	11.00
Scott's Extra Coated, Stamped and Resquared, IC, 20 x 28	19.00
Scott's Extra Coated, Stamped and Resquared, IX, 20 x 28	22.00
Neville, Stamped, IC, 14 x 20	6.25
" " IX, 14 x 20	7.50
" " IC, 20 x 28	12.50
" " IX, 20 x 28	15.00
Taylor's Old Style, IC, 14 x 20 (Stamped and Resquared)	$9.50
Taylor's Old Style, IC, 20 x 28 (Stamped and Resquared)	19.00
Taylor's Roofing, IC, 14 x 20 (Stamped and Resquared)	8.25
Taylor's Roofing, IC, 20 x 28 (Stamped and Resquared)	16.50
Columbia, IC, 14 x 20 (Stamped)	7.25
" IC, 20 x 28 (Stamped)	14.50
Maple, IC, 14 x 20 (Stamped)	6.75
" IC, 20 x 28 (Stamped)	13.50
Willow, IC, 14 x 20	6.50
" IC, 20 x 28	13.00
Knoxall, IC, 14 x 20	6.25
" IC, 20 x 28	12.50
Globe, IC, 14 x 20	6.00
" IC, 20 x 28	12.00
Miami, IC, 14 x 20	6.00
" IC, 20 x 28	12.00
" IX, 20 x 28	15.00
" (Redipped), IC, 20 x 28	17.00

Tin Boiler Plates.

	Per box of 100 sheets.	Per box of 112 sheets.
X, 14 x 28	$13.00	$13.00
XX, 14 x 28	14.50	14.50
X, 14 x 31	14.50	15.80
XX, 14 x 31	16.50	17.50

	Per box of 56 sheets.
X, 14 x 56	29.50 16.50
XX, 14 x 56	32.50 18.20
X, 14 x 60	31.50 17.65
XX, 14 x 60	35.50 20.90

Sheet Iron—

Black.

Nos.	Common American	Refined.
10 to 16	₩ lb 2 6-10¢	3 2-10¢
17 to 20	₩ lb 2 7-10¢	3 3-10¢
21 to 24	₩ lb 2 8-10¢	3 4-10¢
25 and 26	₩ lb 2 9-10¢	3 5-10¢
27	₩ lb 3¢	3 6-10¢

Russia, Planished, &c.

Genuine Russia, all numbers....13¢ net.
Patent Planished....₩ lb A, 10½¢; B, 9½¢ dis. 5%
Craig's Polished Sheet Steel.....8½¢

Galvanized.

Juniata or first quality..dis.70&7½@10%

Copper—

Ingot.

Lake.....12¢ @ 12½¢
Casting Brands.....11¢ @ 11½¢

Sheet and Bolt.

Discount, 25%.

Copper Bottoms.

Discount, 25%.

Seamless Brass and Copper Tubes.

Base price, 17½¢, Chicago, with extras according to size.

Copper, Bronze and Gilding Tube, 3¢ ₩ lb additional.

Brazed Brass Tubing.
(To No. 20 inclusive.)

Add freight from New York to Chicago to these prices, or 50¢ ₩ lb.

Above 5-16 inch to 3 inch inclu	35¢
Plain, above 3 inch	45¢
Plain, 5-16 inch	45¢
Plain, ¼ inch	60¢
Plain, 3-16 inch	$1.00
Plain, ⅛ inch	$1.50
Fancy Tubing, Brass, to No. 20 incl	43¢ lb
Bronze Tubing, 3¢ ₩ lb more than Brass	

40 @ 45%

Roll and Sheet Brass.

Discount, 35 @ 40%.

Slab Spelter—

Western Spelter.....5

Sheet Zinc—

600 lb casks.....5 ¢
300 lb casks.....5½¢
Loose sheets.....5½¢

Lead—

Soft Pig Lead.....3¾¢
Bar.....4½¢
Pipe.....5½¢, dis. 10¢
Block Tin Pipe.....35¢
Sheet.....6¢, dis. 10%

Solder—

½&½.....12¾¢@13¼¢
Extra Wiping.....11½¢

The prices of the many other qualities of Solder in the market indicated by private brands vary according to composition.

Antimony—

Cookson.....12¢@12½¢
Hallett's.....11½¢@11¾¢

Wrought-Iron Pipe—

List on following page.

1¼ and under, Plain	57½&10%
1¼ and under, Galv	50½&10%
1½ and over, Plain	67½&10%
1½ and over, Galv	57½&10%
Boiler Tubes, list Oct. 24, 1892	65@67½%
Casing, list Nov. 16, 1892	52½%
Inserted Joints Casing, list Nov. 16, 1892	47½%
Steel Boiler Tubes	27½%
Cold Drawn Seamless Steel Tubing	50%

Cast-Iron Soil Pipe—

Cast-Iron Soil-Pipe, Tarred; sizes 2 to 6 inches, inclusive.....dis 70&10%
Other sizes.....dis 60%

Leader Pipes—

Abendroth's Galv' Spiral Riveted	60%
Austin's Corrugated	60%
Gordon & Gilbert's Corrugated	60%
Ritchie's (Galv. Iron only) Cor'd	60%
Ritchie's Spiral Lock Seam, Galv'd	55%
Austin's Spiral Ribbed Pipe	60%
Plain Adjustable Elbows	60%
James A. Miller Bros. (Galv'd Iron only) Corrugated	60%

Furnace Fittings—

Discount from Excelsior Steel Furnace Co.'s list.....50%

Steel Roofing—

Perfection	$3.75 square
Climax	$3.50 square
The Lloyd Spanish Tiling	$4.50 square

Metallic Shingles—

Cushman's	$1.25 square
Merchant & Co.'s Spanish Tiles:	
Copper, 14 oz	$36.00 square
Tin	$9.75@$14.25 square
Steel, painted	$9.00 square

Drain Pipe—*Tile.*

Discount from list..... 70%

Paints Oils, &c.—

Deodorized Benzine	7½@8 ¢
Iron Paint, Bright Red	₩ lb, 2 ¢
" " Brown	₩ lb, 1½¢
" " Purple	₩ lb, 2½¢
" Ground in oil, Red	₩ lb, 6½¢
" Ground in oil, Red	₩ lb, 6½¢
" Ground in oil, Brown	₩ lb, 5½¢
" Ground in oil, Purple	₩ lb, 6 ¢
Linseed Oil, Boiled, in bbls	48¢
Linseed Oil, Raw, in bbls	45¢
Mineral Paints	2@4¢
Orange Mineral	10¾¢
Pure White Lead in Oil	6¾@7¼¢
Dry White Lead in bbls	6¼@6¾¢
Red Lead, American	7@7½¢
Red Venetian, English, dry	$1.65@$1.70
Red Venetian in oil; asst'd cans, 8¼¢; kegs	7¼¢
Sipe's Japan Oil, in bbls, ₩ gal	84¢
Spirits Turpentine, in bbls., ₩ gal	35½¢
Asphaltum Trinidad Refined, ₩ ton	$45
Tarred Felt, 1 Ply, ₩ 100 lb	$1.60
Tarred Felt, 2 Ply, ₩ roll 108 sq. feet	$1.25
Tarred Felt, 3 Ply, ₩ roll of 108 sq. feet	$1.70
Roofing Pitch, lb bbl. of 300 lb	$3.00

NEW YORK, DECEMBER 15, 1893.

The following quotations are for small lots.

Aluminum—

No. 2 Grade Metal, in ton lots..₩ lb, $0.75
No 1 (guaranteed to be 98 % pure and over), in ton lots.....₩ lb .90
Lots less than 1 ton, 10¢ ₩ lb additional.

Antimony—

Cookson.....₩ lb, 11¢
Hallett's.....₩ lb, 10¼¢@10½¢

Brass—

Planished.....net
Roll and Sheet.....35@40%

Brass and Copper Tubes

Brazed Brass Tubing—

List May 20, 1889.

	Per lb.
Plain, to No. 20 inclusive, above 5-16 inch to 3 inch inclusive	$0.35
Plain, to No. 20, above 3 inch	45
Plain, 5-16 inch to No. 20	45
Plain, ¼ inch	60
Plain, 3-16 inch	1.00
Plain, ⅛ inch	1.50
Fancy Tubing to No. 20, inclu	43

35@40%

Copper and Bronze Tubing—
3¢ ₩ lb more than brass.

Bronze, Tobin—

Drawn Rods for Bolts, Forgings, &c

Over ¼ to 3½ inches inclusive....17¢ ₩ lb
Over 3½ to 5 inches inclusive.....18¢ ₩ lb

Piston Rods, Finished True, Smooth and Straight.

Over ¼ to 3½ inches inclusive....18¢ ₩ lb
Over 3½ to 5 inches inclusive.....19¢ ₩ lb

Clips—

Buffalo Damper: Nos. 1, $1.25; 2, $2.50 per doz.....40&10%

Conductors—

Corrugated. *Round or Square—*

Galvanized	60%
Galvanized, Locked Joints	60%
Tin	60%

Spiral Riveted—

Galvanized	50%

See also *Elbows and Shoes; Eave-Trough Miters; Strainers, Conductor.*

Conductor Strainers—See *Strainers, Conductor.*

Copper—

Bottoms, Pits and Flats....25@25&5%

Ingot.

Lake	11¢
Ansonia Grade Arizona	10½¢
Ansonia Grade Casting	10¢
Planished	net
Sheet and Bolt	25&25&5%

Tubes—See *Seamless Brass Tubes.*

Coppers, Soldering—

See *Irons, Soldering,* in Current Hardware Prices.

Damper Clips Buffalo—

See Clips, Buffalo Damper.

Eave Troughs—

Lap or Slip Joint, Galvanized.....60&10%
Lap or Slip Joint Terne.....60%

Eave-Trough Mitres—

Lap or Slip Joint.....list, net

Elbows—

Plain Adjustable—

Tin	70%
Galvanized	70%

Crimped Tubing—

Re-Tinned or Galvanized	35%

Stove-Pipe—

Buffalo Four-Piece.

4½	5	5½	6	7 inch,
$0.78	.87	.90	.99	1.20 per doz..20 %

Elbows and Shoes—

Flat Crimp.

Tin	35%
Galvanized	35%

Corrugated.
Flat Crimp.

Galvanized	60%

Round or Square.

Tin	60%
Galvanized	60%

Iron, Sheet—

Black.

Nos.	Common American.	R. G. Cleaned American.
10 to 16	₩ lb, 2.70	3 ¢
17 to 20	₩ lb, 2.80	3.10¢
21 to 24	₩ lb, 2.90	3.20¢
25 and 26	₩ lb, 3	3.30¢
27	₩ lb, 3.10	3.40¢
28	₩ lb, 3.15	3.50¢
American B. B	₩ lb, 4¢@4½¢	

Russia, Planished, &c.

Genuine Russia, according to assortment.....₩ lb, 11¾¢@12¾¢
Patent Planished....₩ lb, A, 10¢; B, 9¢, 5%
Craig Polished Sheet Steel.....₩ lb, 8½¢

Galvanized.

Nos.	B. B.
10 to 16	70%@70&
17 to 22	
23 to 24	
25 to 26	
27	
28	
29 and 30	

Filter Joints—

Lee's.....33½

Lead—

American Pig	4¢@4½¢
Bar	4½¢
Pipe	6½¢, 20%
Tin Lined Pipe	15¢, 20%
Block Tin Pipe	37½¢, 20%
Sheet	7¢, 20%

Old Lead in exchange, 3½¢ ₩ lb.

Metal Exoanded—

Manufacturers' list No. 5.

Lathing	10%
Fencing, Painted Sheets	20%
Netting, Painted Sheets	20%
Door Mats, Galvanized	35%
Window Guards, Paneled	15%
Tree Guards, Paneled	15%

Mitres Eave-Trough—See

Eave-Trough Mitres.

Paints Oils &c.—

Lead, Amn. White, in oil	6¾ @ 7¼
Lead, Red, bbls. and ⅛ bbls	6½ @ 7
Lead, Red, kegs	6½ @ 7
Ocher, American	1 @ 1¾
Red, Venetian, American	1¾ @ 2¾

Linseed Oil:
Raw, ₱ gal..... ..@ .40
Boiled..... ..@ .43

Spirits Turpentine:
In bbls..... ..@ .32

Putty:
In barrels and ½ bbls..... .01¾ @ .01¾
In tubs..... .01¾ @ .01¾
In tin cans ..... .01½ @ .02½
In bladders .... .01⅞ @ .02½

Roofing Material, &c.:
Asphaltum, Trinidad Refined, ₱ ton. .....$30.00@$35.00
Asphaltum, Rock, ₱ ton.....$14.00
Coal Tar Felt, 1 Ply, ₱ ℔.....2¢
Coal Tar Felt, 2 Ply, ₱ roll 108 sq. ft. $1.42½
Coal Tar Felt, 3 Ply, ₱ roll 108 sq. ft. $1.85
Roofing Pitch, ₱ bbl.....$2.25

Pipe, Drain 50%

Pipe and Fittings, Cast Iron Soil—

Cast-Iron Soil Pipe, Tarred, sizes 2 to 6 Inches, inclusive.....60@60&10%
Other sizes.....55@55&10%
Cast-Iron Fittings, Tarred, sizes 2 to 6 inches.....60@60&10%
Other sizes.....55@55&10%

Pipe, Spiral—

Galvanized.....60%
Tin.....60%

Rock and Slag Wool—

	₱ ℔	₱ cub. foot
Slag Wool, ordinary	1¼	15¢
Slag Wool, extra	4¼	38½¢
Rock Wool, ordinary	2¼	27¢
Rock Wool, extra	7¼	43½¢

Rosin—

Omonom and Good—Strained,
Rosin, C. & D.....₱ bbl. $1.32@$1.34
Rosin, E. & F.....₱ bbl. $1.35@$1.45
Rosin, G. & H. ..... ₱ bbl. $1.55@$1.85
Rosin, I. & K.....₱ bbl. $1 85@$2.25
Rosin, M. & N.....₱ bbl $2.80@$3.50

Seamless Brass Tubes..ne

Shoes and Elbows—See *Elbows and Shoes.*

Slate Roofing—

According to size, f.o.b. cars, Quarry Station.

Pennsylvania:
Best Bangor, ₱ sqr.....$3.25@$4.50
Pen Argyle, ₱ sqr..... 3.50@ 4.25
Peach Bottom, ₱ sqr..... 5.00@ 6.25
No. 1 Chapman, ₱ sqr..... 4.00@ 4.65
Lehigh Slates, ₱ sqr..... 3.00@ 4.50
Vermont:
Sea Green, ₱ sqr..... 2.70@ 3.20
Purple, ₱ sqr..... 3.50@ 4.50
Unfading Green, ₱ sqr..... 3.50@ 4.00
Red, ₱ sqr..... 9.75@12.00

Solder and Soldering Fluids—

Solder—

½ & ¼..... 13½@14½¢
No. 1..... 11¾@12 ¢
Prices of Solder indicated by private brands vary according to composition.

Soldering Fluids—

Concentrated Soldering Flux.
f.o.b. New York.
In barrels, ₱ ℔..... .....4¢
Smaller quantities, ₱ ℔.....5¢

Gedney's Soldering Fluid.
In carboys or barrels, ₱ ℔.....2¢
$1.50 for carboy or barrel; money refunded when returned.

Perfection Soldering Flux.
No charge for package.
8bls., about 500 ℔, ₱ ℔.....3½¢
½ bbls., about 300 ℔, ₱ ℔.....4¢
Kegs, about 110 ℔, ₱ ℔.....4¢ } 5% dis.
75¢ extra for keg.
Kegs, about 55 ℔, ₱ ℔.....4¢ }

Yager's Soldering Salts.
¼-℔ bottles, each.....30¢
Large quantities, per ℔.....40¢

Spelter—

Western Spelter..... .....4½¢@4¾¢
Bertha..... .....8¼¢@9¢

Spiral Pipe—See *Pipe, Spiral.*

Stove-Pipe Elbows—*See Elbows, Stove Pipe.*

Stove Polish—See *Polish, Stove.*

Stove Trucks—See *Trucks, Stove.*

Strainers Conductor—

Galvanized.....60%

Tin, Pigs and Bars—

Banca, pigs, ₱ ℔..... .....22½¢
Straits, pigs, ₱ ℔..... 21½¢@22¢
Straits in bars, ₱ ℔..... 22½¢@23¢

Tin Plates—

American Terne Plates—

Alaska (re-squared) IC, 14 x 20.... $7.00
Alderly, extra quality, IC, 14 x 20..6.37½
Allegheny, IC, 14 x 20..... 6.12
" IX, 14 x 20..... 6.38
Apollo Roofing, IC, 14 x 20..... 6.25
" " IX, 14 x 20..... 7.25
Bonus, Extra Coated, IC, 14 x 20... 6.75
" " " IX, 14 x 20.... 8.25
Buckeye, IC, 14 x 20..... 7.00
" IX, 14 x 20..... 8.25
Chicago, IC, 20 x 28 ..... 11.50
Central, IC, 14 x 20 ..... 5.37½
Climax, IC, 14 x 20 ..... 5.70
Columbia, IC, 14 x 20..... 7.00
Crescent, IC, 14 x 20 ..... 6.00
DeMilt's First New York, IC, 14 x 20. 5.75
" First New Jersey, IC, 14 x 20 5.50
" Mohawk, IC, 14 x 20..... 5.50
Dunlap's Double Dipped, IC, 14 x 20 8.25
" " " IX, 14 x 20 9.50
" Domestic, IC, 20 x 28 .....12.00
" " IX, 20 x 28..... 15.00
Empire, IC, 14 x 20 ....6.12½
Extra Central, IC, 14 x 20..... 5.62½
Flag, IC, 14 x 20..... 5.50
Fort Pitt, IC, 20 x 28 ....11.00
Globe, IC, 14 x 20..... 5.75
Hamilton's Best Redipped, IC, 14x20 9.25
" " " IX, 14x20 10.75
Hickory (Resquared), IC, 14 x 20..6.37½
Juno, IC, 14 x 20..... 5.75
Kensington, IC, 14 x 20 ..... 6.75
" IX, 14 x 20 ..... 8.00
Knoxall, IC, 14 x 20 ..... 6.00
Laufman's Apollo (Resquared), IC, 14 x 20 ..... 8.12
Laufman's Apollo (Resquared), IX, 14 x 20 ..... 9.37
Leominster, Extra Coated, IC, 14x20 7.75
Lion (Stamped), IC, 14 x 20..... 6.25
Lula, Best Charcoal, IC, 20 x 28....12.50
" " IX, 20 x 28....16.00
Manhattan, IC, 14 x 20..... 7.00
Maple, IC, 14 x 20 ..... 6.50
Merchant's Old Method (Resquared), IC, 14 x 20 ..... 9.50
Merchant's Roofing (Resquared), IC, 14 x 20..... 8.50
McKinley, IC, 20 x 28..... .....12.00
" IX, 20 x 28..... .....15.00
Neville, IC, 14 x 20 ..... 6.00
" IX, 14 x 20 ..... 7.25
N. F. Old Style, IC, 14 x 20..... 7.50
" " " IX, 14 x 20..... 9.00
Old Colony, IC, 14 x 20..... 8.00
Optimus, Best Redipped, IC, 14 x 20 8.25
" " " IX, 14 x 20 9.50
Osceola, Hand Coated, IC, 14 x 20.. 8.25
" " " IX, 14 x 20.. 9.75
Palacio, IC, 14 x 20..... 5.55
Pennsylvania Old Method (Treble Coated), IC, 14 x 20..... 8.50
Phœnix, IC, 14 x 20..... 5.80
Scott's Extra Coated (Resquared), IC, 14 x 20 ..... 9.25
Scott's Extra Coated (Resquared), IX, 14 x 20 .....10.75
Taylor Old Style (Resquared), IC, 14 x 20..... 9.25
Taylor Roofing, IC, 14 x 20..... 8.00
Thomson's Puritan, IC, 14 x 20.....5.75
Tip Top, IC (Resquared), 14 x 20.... 6.62
" IX " 14 x 20.... 7.88
U. S. Monongahela, IC, 14 x 20..... 6.50
U. S. Redipped, IC, 14 x 20..... 9.25
Venux, IC, 14 x 20 ..... 5.60
Waldo Redipped, IC, 14 x 20..... 7.25
Westmoreland, IC, 14 x 20 ..... 6.25
Wilkinsburg Redipped, IC, 20 x 28.16.00
" " IX, 20 x 28.19.00
Willow, IC, 14 x 20..... 6.25

American Bright Plates—

Almond, IC, 14 x 20.....$6.25
Brilliant (Tissue Packed), IC, 14x20. 9.00
Climax, IC, 14 x 20..... 6.50
" IX, 14 x 20..... 8.00
Florence, IC, 14x20..... 6.75
Hazel, IC, 14x20..... 5.80
Linden, IC, 14x20..... 6.50
Merchant's Dipped, IC, 14x20..... 11.00
Merlon, IC, 14x20.. ..... 6.75
Mint, IC, 14x20..... ..... 6.00
Palma Xtra, IC, 14x20..... 7.25
Phœnix, IC, 14x20..... 6.25
" IX, 14x20..... 7.75
Royal, Extra, IC, 14x20..... 7.00
U. S., IC, 14x20..... ..... 7.25

Imported Terne Plates—

Charcoal.
Dean Grade.—IC, 14 x 20.....@$5.50
20 x 28.....₱11.00
IX, 14 x 20.....@ 6.75
20 x 28.....@13.50
Abercarne Grade.—IC, 14 x 20.....@ 5.40
20 x 28.....@10.80
IX, 14 x 20...@ 6.62½
20 x 28.....@13.25

Imported Bright Plates—

Charcoal.
Duty: 2.2¢ ₱ ℔.
Melyn and Cal-
land Grade. IC, 10 x 14.....@$6.50
" " IC, 12 x 12.....@ 6.75
" " IC, 14 x 20.....@ 6.50
" " IC, 20 x 28.....@13.00
" " IX, 10 x 14.....@ 8.50
" " IX, 12 x 12.....@ 8.75
" " IX, 14 x 20.....@ 8.50
" " IX, 20 x 28.....@17.00
" " DC, 12½ x 17.....@ 6.00
" " DX, 12½ x 17.....@ 8.00
Allaway Grade. IC, 10 x 14.....@ 6.00
" " IC, 12 x 12.....@ 6.25
" " IC, 14 x 20.....@ 6.00
" " IC, 20 x 28.....@12.00
" " IX, 10 x 14.....@ 7.50
" " IX, 12 x 12.....@ 7.75
" " IX, 14 x 20.....@ 7.50
" " IX, 20 x 28.....@15.00
" DC, 12½ x 17.....@ 5.50
" " DX, 12½ x 17.....@ 7.00

Coke.
Steel Coke.—IC, 10x14, 14x20.....@$5.50
10x20.....@ 8.50
20x28.11.50@12.00
IX, 10x14, 14x20.....@ 6.75
B. V. Grade.—IC, 10x14, 14x20....@ 5.55

Imported Boiler Plates.—

IXX, 14x26..(112 sheets)..... ..@$13.35
IXX, 14x28..(112 sheets)..... ..@ 14.50
IXX, 14x31..(112 sheets)..... ..@ 16.00

Tinning—

Brass and Copper.....net

Tubing—

Tin.....55%
Galvanized.....55%

Brass and Copper.—

Standard List..... 35@40%

Troughs, Eave—See *Eave Troughs*

Trucks Stove—

Improved Lock Frame, per doz....$15.00
Steel Lock Frame, per doz..... 18.00
Daisy Improved Pattern, ₱ doz..... 18.00

Zinc—

600 ℔ casks..... ..... ₱ ℔ 5½¢@5¾¢
Per ℔..... ....6½

It Is Reported—

That G. W. Strong, Sherman, N. Y., has sold his stock of Hardware to W. H. Homewood and Henry W. Sperry. Mr. Strong will retain his interest in the sale of carriages and Agricultural Implements.

That J. C. Carter of Minneapolis, Minn., has bought the interest of his uncle, R. D. Boice, in the firm of Boice & Weidlein, Geneseo, Ill. The firm are the oldest Hardware concern in the county.

That Col. B. F. Sheets and Benjamin Knodle have purchased a Hardware store at Rochelle, Ill., of which Mr. Knodle will take charge.

That J. W. McDonald has recently opened a Hardware store at Norfolk, Neb.

That Charles Ellis, Brandon, Wis., has sold out his stock of Hardware.

That J. T. Shannon has sold his stock of Hardware at Madisonville, Texas, to Dr. W. C. Craw.

That a few Revolvers were stolen from the store of Evans Brothers, Roanoke. Va., on the night of the 20th ult.

That Fimrite & Hauge, Elmore, Minn., have purchased a stock of Hardware at Buffalo Center and are in charge.

That James M. New, Hardware merchant, Martinsburg, Iowa, has traded His Hardware store for a farm.

That the Hardware store of T. L. Burnett, Fort Worth, Texas, was entered by burglars on the 23d ult., and a large amount of Cutlery stolen, including Knives and Razors—in all about 20 dozen.

That A. Bahlke has disposed of his Hardware stock at North Star, Mich.

That a Hardware store is being erected at Wayne, Ill., for Ray Boynton.

That Mr. Bingham of Bay City has entered into the Hardware business with J. T. Harvie at Farwell, Mich.

That Burke Bros. of Ellsworth, Minn., have purchased the Hardware stock of M. E. Templer & Co., Trosky, Minn., and have removed it to Ellsworth. An opening is thus left for a Hardware store at Trosky.

That burglars entered the Hardware store of J. A. Boggs, Davenport, Neb., on the 29th ult., and stole about $30 worth of Razors, Pocket Knives, Revolvers, &c.

That Geo. H. Cutter of the Hardware firm of Cutter Bros., Meadville, Pa., shot and killed a burglar while in the act of ransacking the store on the night of the 21st ult.

That E. R. Morrill, senior manager of the Hardware firm of Morrill & Lackey, Woonsocket. S. D., has sold his interest to Fred. Dring.

That Ott & Boden's Hardware store, at West Bend, Wis., was burglarized on the 24th ult. and $150 worth of Knives and Revolvers was taken.

That in a fire at Fort Worth, Texas, on the 23d ult., the Hardware and Stove stock of Lathrop & Co. was damaged by water to the extent of $200.

That the Tompkins-Cary Hardware Company have filed articles of incorporation at Denvor, Col. The capital stock is $100,000. The directors are John Harvey, T. J. Cary, D. La Salle, H. H. Tompkins and S. H. Tompkins.

That S. H. Gay and Henry Gebhardt will soon open up a new Hardware store and Tin shop at Carbon, Wy.

That Foster & Burke, Hardware merchants, Petoskey, Mich., have bought out Williams & Carpenter, and now control most of the Farm Machinery business in that place.

That Christoper Wiemer has bought out his brother's share in the Hardware firm of Wm. Wiemer & Co., Radcliffe, Iowa.

That the new establishment of the Stratman Hardware & Builders' Supply Company, Huntingburg, Ind., is nearly completed.

That the Star & Bullock Hardware Company, Deadwood, S. D., have purchased the plumbing business formerly conducted by the Deadwood Plumbing Company.

That in a large fire at Milan, Mich., on the 4th ult., the Hardware stock and building of O. A. Kelley were destroyed. Loss, $10,000; insurance, $4000.

That Max Ludwig's Hardware store, at Pittston. Pa., was robbed on the 1st inst. Sixty dollars' worth of goods were carried off by the miscreants.

That Charles Bowen contemplates entering the Hardware business at Crooked Creek, Iowa.

That Eastwood & Chase are a new Hardware firm at Monticello, Iowa.

LABOR EXCHANGE.

Notices under this heading of reasonable length are inserted free of charge. Only those relating to employment are admitted. Write distinctly on one side of paper only, and do not use postal cards.

HELP WANTED.

SALESMAN, visiting stove and hardware trade, to sell our goods as a side line; territory, Northwest and Pacific Coast. "Pacific," office of *The Metal Worker*, 96-102 Reade street, New York City. Dec. 16

Men to sell a good line of goods as a side line, on commission, from January 1. Lock Box 364, Peoria, Ill. Dec. 16

Brass Foundry FOREMAN; a competent man to take charge of general brass foundry; five molders; foreman will be expected to make a hand himself; a sober, capable man can secure a permanent situation by addressing "Brass," No. 1216, office of *The Metal Worker*, 96-102 Reade street, New York City. Dec. 16

TRAVELING SALESMAN calling on stove and hardware dealers to handle the Donahue skate sharpener as a side line. J. P. Coleman, Hancock, Delaware County, N. Y. Dec. 16

For Ohio, a first-class TRAVELING SALESMAN to represent an old Ohio foundry; none but experienced need apply. "Butler," office of *The Metal Worker*, 96-102 Reade street, New York City. Dec. 16

RANGE BOILER MAKER, one to take charge of shop in the East. "Boiler Maker," office of *The Metal Worker*, 96-102 Reade street, New York City. Dec. 16

A SALESMAN to travel for an old established steel range company; must thoroughly understand his business and furnish good reference. "Domestic," office of *The Metal Worker*, 59 Dearborn street, Chicago, Ill. Dec. 16

FOREMAN; a good reliable man who can do his own cutting, one with push and energy; married man preferred, or a young ambitious man who is inclined to advance himself. "S. J.," office of *The Metal Worker*, 59 Dearborn street, Chicago, Ill. Dec. 16

For Minnesota, Wisconsin and Dakota, a first-class TRAVELING SALESMAN to represent an Ohio foundry; none but experienced need apply. "Butler," office of *The Metal Worker*, 96-102 Reade street, New York City. Dec. 16

SITUATIONS WANTED.

STOVE MOUNTER; first-class foreman, at the bench or inspector; quick and modern. "Western," office of *The Metal Worker*, 96-102 Reade street, New York City. Dec. 16

A young man 21 years old, strictly temperate, can furnish best of references as to character, wishes to find employment at tinsmiths' trade; nearly three years' experience; wages moderate; at liberty after January 1, 1894. Box 142, Meredith, N. H. Dec. 16

Experienced young HARDWARE SALESMAN of ability and good habits would like a position in retail hardware; can furnish best references. "Retail," No. 1216, office of *The Metal Worker*, 96-102 Reade street, New York City. Dec. 16

A good, steady position with some good and reliable firm, by a young man 26 years of age, as a tin and sheet iron worker; can do all kinds of tin, iron and slate roofing and all kinds of warm air furnace work; can locate and set up the work in any kind of buildings; am single man, steady, sober and industrious, and can furnish first-class reference.s "Heating and Ventilating Engineer," Lock Box 536, Cincinnati, Ohio. Dec. 16

By a man who is good on STEAM, GAS and HOT WATER FITTING; understands tinning, both inside and outside work, and can do a fair job of plumbing. P. Clintonides, Keyport, N. J. Dec. 16

By a HOT AIR FURNACE SALESMAN, with good, practical knowledge of the business, as well as ten years' experience traveling; ready for engagement by January 1, 1894. "Hot Air," office of *The Metal Worker*, 96-102 Reade street, New York City. Dec. 16

A SALESMAN to represent a Western stove house located in New York; must have a business acquaintance and thorough knowledge of the stove and furnace trade in New York City, vicinity and Eastern New Jersey. "Monarch," office of *The Metal Worker*, 96-102 Reade street, New York City. Dec. 16

A practical TINSMITH, who has had over ten years' experience and thoroughly understands the various branches of the trade, also the cutting of patterns, wants a situation after January 1; the South preferred. "H.," 275 East Main street, Norfolk, Va. Dec. 16

A first class SALESMAN, with 15 years' experience and acquaintance among the hardware, tinsmith, roofing, plumbing, steam and hot water trade in Pennsylvania, New Jersey, Delaware, and Maryland, desires to represent a manufacturer for 1894, in territory named, on a salary, commission and expense basis; can furnish A1 Philadelphia reference. "Salesman," office of *The Metal Worker*, 220 South Fourth street, Philadelphia, Pa. Dec. 16

PLUMBER to go West or South with first class plumbers, nine years' experience. P. Dunne, 192 Mallory street, Jersey City, N. J. Dec. 16

SALESMAN of 20 years' experience in the stove, hot air furnace, steam and hot water heating business, on and off the road, desires to represent a leading manufacturer who would establish an office in Philadelphia, for the sale of same in Middle and Southern States; best of reference. "Hot Water Salesman," office of *The Metal Worker*, 220 South Fourth street, Philadelphia, Pa. Dec. 16

By a young TINSMITH; city or country; able to do roofing, furnace work and general jobbing. Edelmath, care of Jos. Mark, 545 East Seventy-fourth street, New York City. Dec. 1

After January 1, 1894, by sober, industrious mechanic, a steady situation with a reliable house; for the past three years has had sole management of country shop doing a business of nearly $40,000 the past year; competent to estimate on and carry out any plumbing job that is found in large town or small city, as well as house heating by steam, hot water or hot air; state wages; age 35 years; 15 years' experience; good reference furnished. "B. A. E.," office of *The Metal Worker*, 96-102 Reade street, New York City. Dec. 16

As FOREMAN of stove works, by an experienced man 41 years of age; steady and temperate; can furnish good references. "Foreman Molder," office of *The Metal Worker*, 96-102 Reade street, New York City. Dec. 16

As TRAVELING SALESMAN for stoves or house furnishing goods. "P. A.," office of *The Metal Worker*, 96-102 Reade street, New York City. Dec. 16

A man with 12 years' experience as FOREMAN of a foundry making stoves, ranges and furnaces desires a position; am a practical molder; thoroughly understand cupola practice and can handle men to advantage; first-class reference from present employers, who expect to quit business after January 1, 1894. "F. F." office of *The Metal Worker*, 96-102 Reade street, New York. Dec. 16

By a first-class TIN and SHEET IRON WORKER with 12 years' experience at inside and outside work; can also do roofing and general jobbing; furnace work a specialty. "A. G.," office of *The Metal Worker*, 96-102 Reade street, New York City. Dec. 16

HEATING ENGINEER and TRAVELING SALESMAN wishes engagement for 1894; five years' experience and acquainted with the trade in Pennsylvania, New York and the New England States. "Experience," No. 1216, office of *The Metal Worker*, 96-102 Reade street, New York City. Dec. 16

By a good steady PLUMBER, STEAM and HOT WATER FITTER; city or country; can furnish reference. E. J. McGinley, 3120 Almond street, Philadelphia. Dec. 16

By a BRASS MOLDER who thoroughly understands plumbing and steam fitting; capable of taking charge; 12 years' experience; city or country. "D. N.," 214 South street, Boston, Mass. Dec. 16

An American, good jobbing TINNER and country PLUMBER, also well up in steam and hot water heating, can estimate from plans and specifications and capable of taking charge of any general jobbing shop, wants work; strictly temperate. Purrish Bros., Great Barrington, Mass. Dec. 16

By a sober and industrious young man, as PLUMBER and GAS FITTER: wages moderate; country preferred. "J. P. B.," 131 Park avenue, Hoboken, N. J. Dec. 16

By a TIN and SHEET IRON WORKER. Henry Newberger, 300 Broome street, New York City. Dec. 16

By a PLUMBER of two years' experience; willing to go anywhere; reference furnished if required. Orlando C. Kent, 89 Elm street, Danbury, Conn. Dec. 16

By an ELECTRO-PLATER of 30 years' practical experience upon work of every description, with all solutions—oxide, polishing, buffing, lathe and hand burnishing; reference. "Electro-Plater," 35 Sheafer street, Cleveland, Ohio. Dec. 16

A METAL PATTERN MAKER; can file or fit or repair stove patterns; understands drop hammer work and carriage hardware; a steady job wanted; sober and industrious; has a good education; used to doing square work and a dollar's worth for a dollar. "J. M. D.," 11 Delevan street, Auburn, N. Y. Dec. 16

By a young married man, with five years' experience in PLUMBING, steam and water fitting; good reference; Massachusetts, Rhode Island or Connecticut preferred. Edward E. Silvery, 163 Locust street, Dover, N. H. Dec. 16

By an experienced city SALESMAN, a good line of hardware, tinware or cutlery; experience and references. "Box 49," office of *The Metal Worker*, 59 Dearborn street, Chicago, Ill. Dec. 16

A young man of experience desires to REPRESENT some manufacturing concern connected with the hardware trade; prefer tinware, cutlery, or some good specialty; address, with full particulars, "Tinware," No. 1216, office of *The Metal Worker*, 96-102 Reade street, New York City. Dec. 16

As SUPERINTENDENT or FOREMAN of FOUNDRY, by a practical foundryman and molder; 30 years in foundry work; speaks both German and English; well posted on all lines of work, stove, furnace and art metal casting; temperate and reliable; good references; has held positions of same character for the past two years; understands the management of cupola and the handling of men; open for engagement January 1, 1894. "Art Metal," office of *The Metal Worker*, 96-102 Reade street, New York City. Dec. 16

By a TINNER of 15 years' experience at the tin, sheet iron, pump and stove business, who also understands the hardware business; I am a married man and strictly temperate in all my habits and can furnish best of references both as to character and ability. "C. F. B.," Box 186, Malone, N. Y. Dec. 16

By a METAL SPINNER who thoroughly understands his business; if necessary, can take charge of small shop; can come highly recommended. "F. W. P.," 455 Ninth avenue, New York City. Dec. 16

PLUMBER, nine years' practical experience, would like a steady position in any part of the United States or Canada; can furnish the best of references. James Godsell, 1221 Third avenue, New York City. Dec. 16

As TINSMITH, ROOFER and GENERAL JOBBER. Isaac Wallestan, 101 Elm street, New York City. Dec. 16

A position as TRAVELING SALESMAN with a good tin and metal or iron roofing house for next season; will work cheap until trade will authorize fair pay. "A. S. C.," 193 West Sixth street, Cincinnati, Ohio. Dec. 16

As SPINNER and IRON WORKER, on tin and all kinds of stamped ware: 17 years' experience with an iron clad manufacturing company; can do anything in the line of spinning and wiring. Chas. Seider, 263 Floyd street, Brooklyn, N. Y. Dec. 16

By a good TIN and SHEET IRON WORKER, who is also a TIN and SLATE ROOFER; 16 years' experience; temperate; can furnish best of references. M. C. Wallace, 16 North Fifth street, Fort Smith, Ark. Dec. 16

By a young married man, speaks English and German, a steady job the year round with a good firm as TINNER; am considered a strictly first-class man and capable of taking charge of shop; have some knowledge of plumbing and can give the very best of reference as to honesty, sobriety and capability; the Pacific Coast preferred. "Tinner," 2529 South G street, Tacoma, Washington. Dec. 16

A1 BOOKKEEPER and CASHIER, with highest New York references, desires position in a wholesale hardware or importing house; speaks and writes German, French and English; excellent accountant. Francis L. Glessner, 313 Schermerhorn street, Brooklyn, N. Y. Dec. 16

By a TIN and SHEET IRON WORKER. N. Bloom, 40 Orchard street, New York City. Dec. 16

Before or by January 1, by a young TINSMITH, with eight years' experience at roofing, plumbing, stove, range and furnace work and general jobbing, also all kinds of pumps. Box 75, Manhasset, L. I. Dec. 16

TRAVELING SALESMAN, experienced and conservative, with extensive acquaintance among the hardware trade of Texas and the Indian Territory, is open for an engagement with reliable hardware firm after January 1, 1894; well posted on tin plate and other sheet metals; no objection to other territory. "Hardware," P. O. Box 1746, New Orleans, La. Dec. 16

By a good steady PLUMBER, city or country. J. Fitz, 222 East Eleventh street, New York City. Dec. 9

THE METAL WORKER.

NEW YORK AND CHICAGO.

Saturday, December 23, 1893.

DAVID WILLIAMS, - PUBLISHER

BUSINESS OFFICES:

NEW YORK.....96-102 Reade Street.
PHILADELPHIA.....220 South Fourth Street.
BOSTON.....146 Franklin Street.
PITTSBURGH..... Room 509 Hamilton Building.
CHICAGO.....59 Dearborn Street, cor. Randolph.
CINCINNATI.....Rooms 22-24 Pickering Building.
ST. LOUIS.....Bank of Commerce Building.
CLEVELAND.....312 The Cuyahoga.

BRITISH AGENCY: The Ironmonger, 42 Cannon street, London, England.

Domestic Coal Consumption.

In large manufacturing establishments the amount of coal consumed is generally very accurately determined. The coal is usually weighed on the premises as delivered, and thus there is little room for error or fraud in the delivery. The same cannot be said of coal as purchased for domestic use from coal yards. The large majority of people have no way of determining whether or not the amount delivered is the amount purchased and paid for; and if such facilities for the commission of fraud do not sometimes lead to it, coal dealers must possess, on the average, a much higher standard of commercial morality than grocers, butchers and others from whom domestic supplies are obtained. That such frauds do occur is evidenced by the fact that a recent prosecution of a coal dealer by a customer who took special and unexpected pains to privately reweigh coal delivered resulted in a judgment in favor of the plaintiff. It might be advisable for other consumers to take similar pains. Some think that a close enough estimate can be made by a comparison between the bulk of any particular delivery with that of previous deliveries. But, aside from the fact that previous deliveries have generally been accepted as correct without reweighing, and so form no trustworthy standard of comparison, this method is unreliable in other respects. There is much variation in the density of coal, as may be proved by testing specimens from different mines, and even from the same mine at different periods. The specific gravity tables in engineering books give averages, not absolute, invariable figures. Specific gravity of various coals may differ as widely as 20 per cent. The only true way to determine weight is to weigh, except with substances whose weight for a given bulk is known to be constant.

Scales for Domestic Coal Weighing.

Very few domestic establishments are provided with suitable scales for conveniently weighing fuel. Even with platform scales large enough to weigh a considerable bulk, say 200 pounds, it would not always be convenient to weigh coal as delivered, though in most case with such scales this could be done; but spring scales, which will weigh 50 pounds, are not costly affairs, and with these coal may be weighed in the hod as consumed with little trouble, and a well kept tally would in the end show conclusively whether the amount purchased was fully delivered or otherwise. If people were known to adopt generally or even partially the system of weighing coal during its consumption dealers would soon become very careful to deliver full weight. Also some errors of judgment that more or less affect the furnace and steam heating trades would cease to be committed. For instance, a householder speaking of a new furnace he had used during a single winter said, "It is a handy furnace and heats well, but I judge it burns about three tons of coal more than the old one."

How a Furnace May Be Misjudged.

The person to whom the statement just quoted was made very patiently asked on what the estimate was based and was answered that the usual supply having been exhausted, 3 tons more, nearly all of which was burned, had to be purchased to get through the season, and as the average cold during the winter had not materially varied from that of the preceding winter, the required addition was attributed to the new furnace. In further conversation it came out that the coal had that year been purchased from a different yard than formerly. Of course there might have been more coal actually consumed; but, on the other hand, it is equally possible that injustice was done to the furnace and its manufacturer. This will appear more probable from a brief account of a different experience on the part of a resident of the same city. The person referred to had been in the habit of putting in coal purchased from a particular yard for some six or seven years in succession, the amount purchased and paid for for furnace use being 20 tons. Except in specially mild seasons the amount delivered was very nearly or quite consumed, the house being large and the furnace correspondingly large. One year, for some reason, he was led to buy his supply from another dealer, the same quantity being paid for and the same kind of coal being ordered. That year the winter was colder than the average, yet, at the end of the season, although the same person attended the furnace as in former seasons, he estimated that there remained in the coal bin at the end of the season not less than 2 tons. Now suppose this to have happened at the end of a season when a new furnace had been put in. In all probability the new furnace would have been credited with superior economy, and with no better foundation than that upon which the furnace previously cited was discredited. Very likely a heating apparatus is often misjudged through blind confidence placed in the integrity of coal dealers—a confidence paralleled in no other trade. People will weigh butter and meat suspected of light weight, but coal, not once in a hundred times.

The "Massachusetts Society for Promoting Good Citizenship" is a Boston association which is doing capital work in ventilating patriotic and social questions, and especially in educational matters. At a recent meeting of the society the topic for consideration was "Industrial Education and its Bearings on Citizenship and Social Progress." The subject was extensively debated by a number of educational authorities, officers of trade associations and persons engaged in philanthropic work, and strong opinions of the value of trade and technical training were expressed. The Superintendent of Public Schools of Boston spoke very favorably of the idea of trade schools, and favored the formation of an association in Boston to look after the needs of industrial education. Similar sentiments were conveyed in a speech by President Lathrop, of the Wood Carvers' Association, who favored the establishment of trade schools in order to benefit American boys, who, he said, are being forced out of the industries of the city by the competition of alien labor.

November's coinage by the United States mints was the greatest executed in any one month for many years past. The number of pieces coined aggregated 7,523,602, of the value of $11,031,440.35. Of this amount the gold coined aggregated 1,265,400 pieces, of the value of $10,784,800; the silver only 976,202 pieces, of the value of $142,340.35. Of the minor coin, 4,120,000 1-cent pieces were coined, to meet the demands of the Christmas trade.

The City Council of St. Paul has recently paid out $9000, in sums of $1.50 per half day, to the unemployed of the city, and has now voted $5000 more for the same purpose. Only $1 per half day will, however, be paid henceforth.

THE LETTER BOX.

Wants Rule for Furnace Capacity.

From E. P., *Philadelphia, Pa.*—Not having any great experience in furnace work, and being anxious to learn something even at the risk of showing my ignorance, I would like to be informed of a simple way of finding the area of furnace pipes ; also to find the number of cubic feet of space a furnace will heat having a given size fire pot and grate surface. As this subject may interest other readers of *The Metal Worker*, I would be pleased to have the information asked for supplied through its colums.

Note.—The area of a furnace pipe is found by squaring the diameter—that is, multiplying it by itself, and then multiplying by 0.7854. For instance, if a pipe is 10 inches in diameter, the diameter multiplied by itself is 100, and this multiplied by the decimal fraction will give an area of practically 78½ square inches. This rule is used for calculating the area of all circles. The second question has been previously asked in *The Metal Worker* without response. We know of no such rule, but can appreciate how valuable it would be to furnacemen. No doubt one rule would not apply to all constructions, and much difficulty would be met in formulating rules that would so apply, but this should not prevent the progressive furnacemen from making the attempt. The Letter Box is open for the discussion and we shall be glad to hear from our readers.

Another Inquiry for Boston Plumbers' Paste.

From W. F. S., *Bayfield, Wis.*—Some time ago a question was asked in *The Metal Worker* for the paste that Boston plumbers use instead of soil to prevent solder sticking when they make wiped joints. I would like very much to have the question inserted again, for it is better than soil and I think a great many more would like to have the recipe.

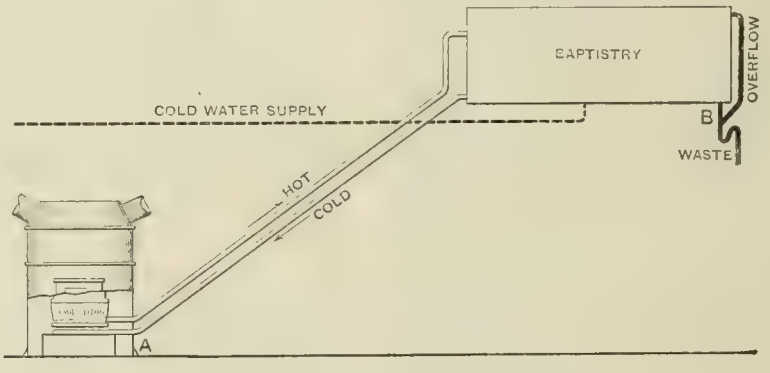
Note.—At the request of our correspondent we insert this again, and hope that some of our Boston readers will favor us with the information desired.

Pipe Fitting and Plumbing Queries.

From S. T., *Tamaqua, Pa.*—Referring to the inquiry of "E. V. S.," in *The Metal Worker* of November 25, I submit my opinion, gained from experience and intercourse with many practical fitters. The leaky joint does not result from the want of a good preparation to cover the thread, red lead being as good as any, and one universally used. The trouble lies either in the thread on the pipe or the thread in the fittings, or sometimes both threads. In cutting threads by hand, the thread is very often broken on account of a defective die or because of insufficient oil being used while the cutting is being done. Then, again, a poorly threaded fitting, either too tight or too loose for the pipe will cause a leak that can only be properly stopped by a new fitting. A nipple that is cut with adjustable dies will sometimes vary in size of thread. I think, in conclusion, that if the fitter uses care in selection of fittings—care in seeing that his threads are clean and true—that many leaky joints may be avoided.

Heating Coil Outside of Fire Pot.

From BAPTISTRY, *Suffolk, Va.*—Will you please answer the following inquiries in your valuable paper : Can water be heated sufficiently for use in a baptistry by placing a coil of pipe around the outside of the fire pot of a hot air furnace? My intention is to arrange the coil close to the fire pot, like the worm in a distillery, about 2 inches above the grate line. The water pressure in our city is from 35 to 70 pounds. What provisions for a perfect circulation are necessary beyond what are shown in the diagram, and how shall the danger of the water getting too hot be avoided, and when the cold water is shut off how shall the pipes be kept from bursting? Will the plan as shown in the diagram meet all requirements?



Heating Coil Outside of Fire Pot.

Note.—Much depends on the conditions as to the heating power of the coil located as shown. If the fire pot is thin and it gets well heated so low down, the cooling influence of a current of air passing over the coil may be overcome and the water heated sufficiently. If the coil was placed higher up it would receive more heat, and if the baptistry is very large it may be necessary to raise it up. Some experience with a heating coil outside of a fire pot is given in the Letter Box of October 7. The arrangement of the coil and the connection with the baptistry is correct. A stop cock should be placed near the furnace at A to empty the pipes when necessary and also on the waste pipe from the bottom of the baptistry at B, as shown. If the water supply is not shut off a continual waste would occur, while it is probable that the water would not be heated sufficiently, but by regulating the supply cock the temperature could be governed. If the water supply is shut off when the baptistry is full there will be a circulation that will prevent any likelihood of the pipes bursting, but this continual circulation would probably make the water too hot and steam or vapor would come up into the church. If the cocks are placed as suggested, the system can be emptied, and it is not probable that the coil placed as suggested will ever be heated sufficiently to be damaged.

Faulty Pipe Suction.

From J. W. C., *Greenfield, Ind.*—I see in *The Metal Worker* of December 16 a cut of the pump casing that I wrote you about. There is, however, a mistake in the drawing, for the casing is 8 inches instead of 3, as you have it. The 2-inch pipe extends 400 to 500 feet down and is filled with gas under a pressure of 150 pounds. The 8-inch casing extends down 200 feet to limestone. The 8-inch pipe is filled around the 2-inch pipe with packing, and then lead poured in and calked water tight. Water is plentiful. I had the pump set with suction ¾-inch pipe up and over the top of the 8-inch pipe and down to the water, but the friction was so great I had to use a 2½-inch cylinder, which did not throw enough water, and this was the reason for the new arrangement I adopted. With this explanation I hope some one will be able to offer me suggestions.

Buttermilk Strainer Wanted.

From JOHN SPOTES, *Eastport, Maine.*—Will some reader of *The Metal Worker* tell me how to make a buttermilk strainer or where I can buy them?

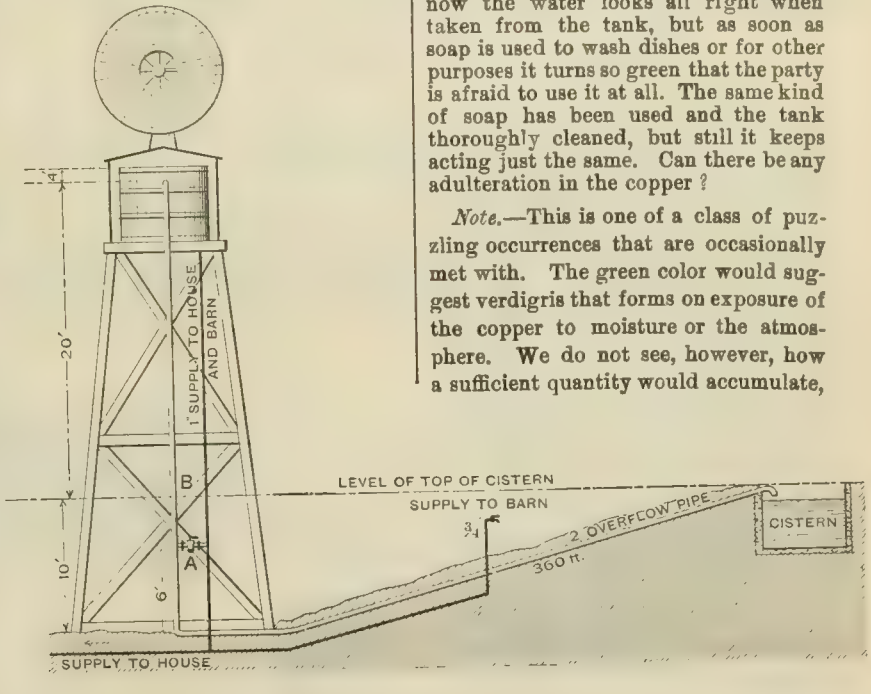
IX vs. IC Tin for Hot Air Pipes.

From CÆSAR, *Louisville, Ky.*—Referring to your remarks on my letter in *The Metal Worker* of November 25 and also to "Y. A. M.'s" comments in the issue of December 2 on the relative loss by radiation between IC and IX pipes, would say that I have never tried to ascertain what the difference is, but have practically demonstrated the question to my own satisfaction. When I have had pipes leave the furnace cellar and pass into an adjoining cellar which was cold I have had the IX pipe work and IC one not work. Again, in some cases, I wrapped the long or exposed pipe with asbestos paper from register to and within the furnace cellar. It is, or should be, a well known fact that thickness of covering prevents loss by radiation of heat. If this is not a fact, then why do we require an extra coat or heavier clothing when the weather gets colder? Again, why is it that an IC pipe will work all right when it is confined to the furnace cellar, and the same pipe, though of the same length, will fail when passed through a wall into an adjoining cold cellar? Heat is radiated in all cases at a right angle from the surface of the radiator, and it does seem to me that the greater thickness you can place between the inner warm current of air and the outer cold strata of air the less will be the loss by radiation. However, I am open for information on this subject, and if any good brother of the craft can enlighten me I shall be gratified.

Note.—Our correspondent has asked for opinions from the trade and we do not propose to push in our ideas to the exclusion of what our correspondents may have to furnish. The heavier clothes that one wears during the winter do not offer a parallel with the case of the thicker pipe, for a winter's overcoat is nothing but a collection of little air cells kept in by woolen walls. The greater number of layers of these air cells the better protection is there given against the radiation of heat from within. It is the constantly varying medium from wool to air that makes it so good a non conductor. If we could imagine wool packed down to the density of iron we do not think there would be much advantage in wearing a wool coat of IX gauge over one of IC gauge. The commonly accepted theory is that the difficulty in transmitting heat through metals is not due to the resistance of the metal itself so much as to the resistance of the absobing surface and the emitting surface. In other words—after the heat once gets into the metal it will travel through it with little reduction, but then there is a considerable loss when it gets to the other side and has to be radiated. There is a great difference, as we all know, between the loss of heat from a rough and black and bright and polished surface. Of course, this theory has its limits, and we would not pretend to say that a furnace pipe made from 6-inch armor plate would radiate as much heat as if it were made of taggers' iron. In covering pipes with asbestos and other non-conductors it is like putting on a winter coat. It is the air cells and fibrous materials inclosing them that prevent the transfer of heat. This is a subject of more than usual importance, and we believe that there must be many observers in the furnace trade who can furnish from their experience valuable conclusions and suggestions respecting the loss of heat from sheet metal pipes of different thicknesses. If it has been proven in practice that an IX pipe is very much superior, in going through cold rooms, to IC pipe, the trade wants to know it, so that they may make practical use of the information, all the arguments of the conductivity of metals to the contrary, notwithstanding. There is more good to be gained from practical experiment than from listening to a debating society.

Pipes from Tank.

From M. T. C., *Riverside, Cal.*—Will some of the readers of *The Metal Worker* inform me how to get water to run to a cistern through a 2-inch overflow pipe when the tank becomes full from the pumping of a windmill. A 3-inch pipe is attached to tank within four inches of the top. This pipe is reduced to 2 inches and extends to cistern, as shown. The cistern is located on high ground and the water from it is used for irrigating an orchard. A 1-inch supply pipe is taken from the bottom of the tank and is connected with house and barn. At A is placed a stop cock which can be opened to allow the tank to empty into overflow pipe. When the tank becomes full the water does not run out through the top of overflow pipe, but over the top of the tank. When the tank is full, by opening the stop cock at A for a short time the water will run out of tank through overflow pipe until it reaches the lower part of opening, but will not start itself when the tank again becomes full. While the pump is in operation the water continues to run over top of tank and will do so until the stop cock at A is opened or the pump is stopped.



Pipes from Tank.

Note.—The behavior of the water under the conditions reported seems extraordinary, but we hope that submitting the problem to our readers for solution will call forth some explanations. It is quite possible that in a pipe that runs a distance of 360 feet up a grade of 10 feet there are dips and raises that would become air traps. The action of an air bound pipe is often puzzling and the best way to overcome the trouble is to remove the air pockets.

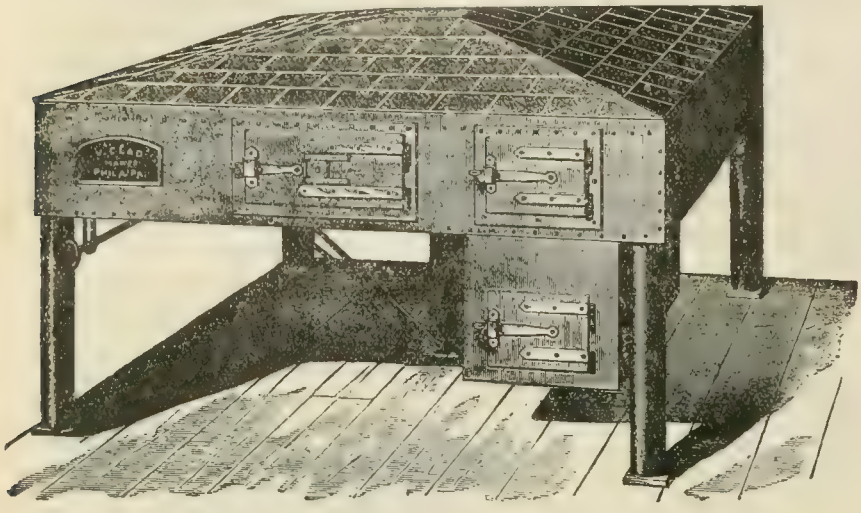
Green Water from Copper Tank.

From J. H. S., *Richmond, Maine.*—Will you please let me know through the columns of *The Metal Worker* if anything like the following has come under your observation? A little more than a year ago I made a new copper tank for a range, the old one having burned out. The new one has been satisfactory until within a few days, now the water looks all right when taken from the tank, but as soon as soap is used to wash dishes or for other purposes it turns so green that the party is afraid to use it at all. The same kind of soap has been used and the tank thoroughly cleaned, but still it keeps acting just the same. Can there be any adulteration in the copper?

Note.—This is one of a class of puzzling occurrences that are occasionally met with. The green color would suggest verdigris that forms on exposure of the copper to moisture or the atmosphere. We do not see, however, how a sufficient quantity would accumulate, particularly as the tank has been cleaned and the water, presumably, frequently withdrawn. As it appears only when the soap is added to the water, it indicates that there is something in the solution that is precipitated by the addition of the soap, thus making it evident to the eye. We can offer no suggestions to our correspondent, for we have never heard of a similar instance before, and we have never known of sheet copper being adulterated in any way. In fact, it is necessary to have the copper very pure for rolling, and the only admixture is occasionally a trace of lead, but that is only a fraction of a per cent., and does not in any way explain the green water mentioned.

Portable Brick Bake Oven.

The erection of a bake oven on premises which are not owned by the baker calls for an expense that few desire to make unless a long lease can be secured. In some instances the lack of capital interferes with the baker supplying his own oven, and in other cases the owner of the property is not willing to make such an addition for the benefit of the baker. The illustrations presented herewith show a portable brick bake oven manufactured by V. Clad & Sons, 117–119 South Eleventh street, Philadelphia, which is designed to such requirements. Fig. 1 shows the bake oven complete, and in Fig. 2 is a sectional view showing the location of the fire box, the smoke outlet and the general construction. The outside body of the oven is a heavy steel casing, with oven mouth, fire door and fire box securely fastened to it, the whole being mounted on five large pipe legs, and the structure being bolted and braced with buck stays and tie rods. The oven is furnished complete with the necessary fire brick for the hearth and other parts required for setting. The makers say that the lines for the arch are marked off and after the casing is set up an ordinary brick mason can fill in with common red brick, gravel and sand, completing the oven ready for use. The steel body is of such a weight as to hold the oven securely together, and prevent the cracks that occur in brick ovens as ordinarily built. In case of a desire to move from one location to another, by simply removing the sand and the bricks, the whole oven can be taken apart and transported. The oven is said to accomplish everything that the old fashioned bake oven is capable of doing and possesses many substantial advantages. The oven is made in six sizes, the smallest being 6 x 6 feet, outside measurement, and the largest 8 x 8 feet.



Portable Brick Oven.—Fig. 1.—General View of Oven.

President Gompers of the American Federation of Labor places the present number of unemployed workmen in the United States at 3,000,000. Mr. Gompers, in his annual address in Chicago on Monday last, attributes the dearth of employment to the extraordinary industrial depression of the past few months, superinduced by overproduction and the general adoption of labor saving machinery. The only method, he believes, by which a practical, just and safe equilibrium can be preserved in the industrial world for the fast and ever-increasing introduction of machinery is a commensurate reduction of the hours of labor. He expressed himself as very sure that if employers were to substitute a division of the work required among all their workers instead of the discharge of a number, the country would much sooner emerge from its present industrial and commercial stagnation. This is a part of the truth, doubtless, if not the whole of it.

A Curious Occupation.

In the cost accounts of South Staffordshire, England, rolling mills there is an item which finds no place in similar accounts in this country. It appears on the credit side, and represents the amount paid by an individual known as the "breezeman" for the privilege of hauling away, without cost to the company, the cinders falling from the grates of furnaces. The consideration is usually about half a crown for two weeks for each furnace burning lump coal, and it is further agreed that the boiler ashes be removed free of cost, although they have no value. The cinders from the furnaces are taken by the breezeman to an open space, where they are spread on the ground about a foot thick. Women who are employed for the purpose then rake out all the clinkers and bats, leaving nothing but dust and partly burned cinders, which are still combustible matter. This is wheeled to a large tub with water running through it, and dumped therein. The water is agitated by means of a long rake, and as soon as the dust is washed off and the black cinders float on the surface of the water they are removed with a large sieve of about 1-inch mesh, and at once become a marketable fuel known as "breeze," used extensively in the shops where hand made nails are wrought into shape by women, and in shops making light axles, &c., also in all blacksmith shops. It meets with a ready sale, and carts having huge sideboards, containing breeze, are a common sight on the roads between Birmingham and Dudley. The "breezeman" derives his income from the sale of breeze, less the amount paid to the company for the privilege and the cost of labor. Usually he makes a good living. He rents the furnaces for a year and takes chances on having a large stock on hand on account of nailers' or axle makers' labor troubles.

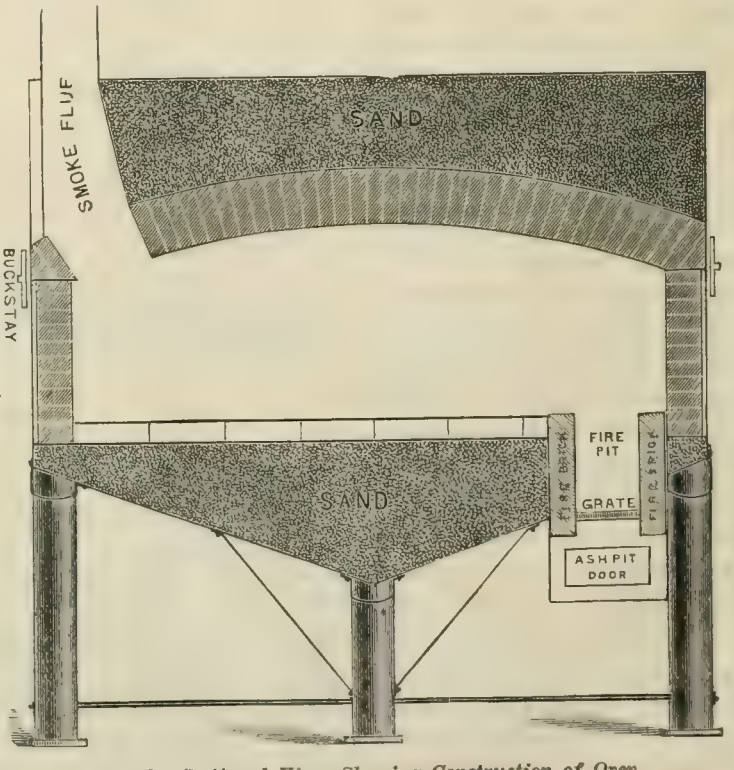


Fig. 2.—Sectional View, Showing Construction of Oven.

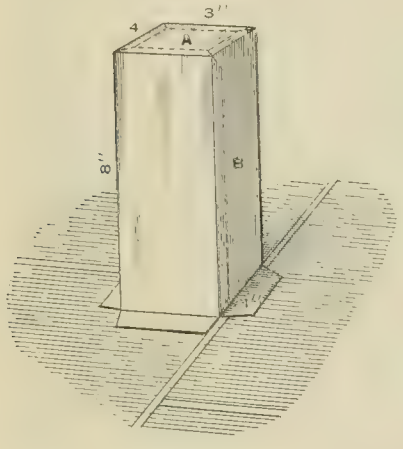
Richard Raddatz of Oshkosh, Wis., is reported to have succeeded, after ten years' study and experiment, in producing a submarine boat which can operate at great depth and be run by one man. The boat has been engaged by a Detroi wrecking firm to make a survey of western Lake Huron next spring.

Philadelphia is to dispose of her garbage by cremation. A proposed ordinance provides for the construction of a number of furnaces at $40,000 each.

ROOFING AND CORNICE.

Trouble with a Roof.

From W. N., *New York.*—The following account of a method I employ in protecting metal roofs may be interesting to some of your readers. In Fig. 1 is shown a piece of joist called blocks, covered with tin or other metal, the joist being cut to any desired hight. In this case it is 3 x 4, and 8 inches in



Trouble with a Roof.—Fig. 1.—Showing Block Covered with Tin.

hight. A flange 1 inch in width projects all around the bottom of block, as shown in Fig. 1, and is used to solder water tight to the roof. The dotted line shown at the side at B, and top at A, indicates how the laps are placed, and over the top of the laps, as shown at A, a piece of metal is soldered water tight. These blocks are now set in their proper positions on the metal roof,

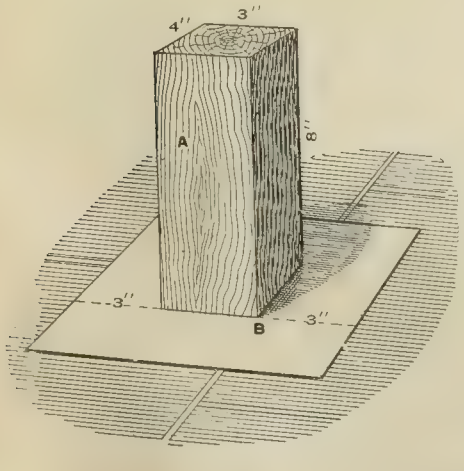


Fig. 2.—Showing Block Resting on Sheet Copper.

say about 6 feet apart, and soldered water tight to the tin or galvanized iron roof. This keeps the water from soaking under the block and rusting out the metal roof. After all of the blocks have been properly placed, cross joists are set on top of same. Then spruce strips of 1¼ x 3 inches in thickness are nailed at right angles to the cross joists not over 2 inches apart. In making the platform it should be made in such sections that it can be easily removed in case the roof needs repairing or painting. If the roof was very large quite a number of blocks would be required, and as there may be some objection to the expense of covering the blocks, Fig. 2 shows how the covering could be avoided. A in Fig. 2 represents the wooden block of the same size as shown in Fig. 1. If the wooden blocks were set direct upon the tin or galvanized iron roofs it would be found after each rain, even after the roof was dry, that it would be quite wet between the wooden block and metal roof, because the air could not circulate, and in time the tin or galvanized iron would be rusted through. Therefore, to avoid the rusting of the tin or galvanized iron, and still not cover the blocks, we would proceed as follows: In Fig. 2 B represents a piece of 18-ounce sheet copper tinned on both sides, projecting 2 to 3 inches all around the entire block, as shown in Fig. 2, and is then soldered water tight to the roof. On top of this sheet copper the wooden block is set. The water soaking between the wooden block and sheet copper would have no effect in destroying the copper, as would be the case if placed direct upon the tin or galvanized iron, as before explained. The sheet copper is tinned on both sides, so as to avoid any electrical action between the two metals that would eventually destroy the tin or galvanized iron.

FLASHINGS.

An illustrated catalogue issued by Gara, McGinley & Co., Philadelphia, Pa., is a pamphlet 11 x 9 inches in size containing over 100 pages. The first section is devoted to metal fronts, many illustrations of different styles being shown. Cornices and other sheet metal work in connection with the roofs of houses occupies the middle of the publication. These include window and door heads, finials, bay windows, vanes, crosses, &c., also iron crestings and ridging, skylights. Various forms of zinc ornaments are illustrated, also metal ceilings. The firm are also sending out some timely reminders to householders, calling attention to the need of repairing and painting roofs before the winter season, that injury by leaks may be avoided.

Joseph James, post office box 887, Montreal, Canada, issues a circular letter addressed to the trade calling attention to Actinolite asphalt for roofing, which is claimed to be a composition that will not crack in severe Canadian winters, nor run in the hot summer that they have in Montreal.

The Eclipse Machine Company, Troy, N. Y., have during the past year brought out the Eclipse gutter beading machines, intended for making galvanized gutters and eave troughs 12 feet long. It is operated by hand power and fitted with three mandrels, so that there may be turned out three sizes of beads and any size of gutter.

We are indebted to the Clay Shingle Company of Indianapolis, Ind., for a copy of an interesting pamphlet entitled "Burned Clay as a Roofing Material," prepared by John R. Elder of the city named. The matter consists of a paper read before the seventh annual convention of the National Brick Manufacturers' Association, at Louisville, in January last.

At the close of the year with such a record for dull trade as 1893 it is somewhat cheering to learn that there are a few concerns whose books show an increase in business. Among the number is the New York Iron Roofing & Corrugating Company, controlling two factories at Jersey City and Philadelphia respectively. They state that during this year their business has reached 3500 tons of black sheets, corrugated and painted and for other forms of roofing and siding, also 400 tons of galvanized roofing. This is a marked increase over 1892.

The collapse of the great bridge now under construction between East Louisville and Jeffersonville, Ind., which occurred last Friday, was one of the greatest disasters of the kind experienced of late years. The accident was caused by the strong current and heavy wind carrying away the iron and timber false work of the 500-foot span in the middle of the river, the fall of which brought down the other spans with it. Many workmen were drowned or buried under the falling mass of *débris*. The structure was the work of the Phœnix Bridge Company of Phœnixville, Pa., and was being erected by them. Every precaution had been taken to prevent disaster, and it is stated that the company have received a dispatch from the engineer in charge of the railroad for which the bridge was being built, exonerating them from all blame.

The World's Fair Prize Winners' Exposition.

Under the management of the Manhattan Industrial Exposition Company, this exposition is being held at the Grand Central Palace, Forty-third street and Lexington avenue, New York. In addition to some of the prize winners a great many features of the Midway Plaisance are on exhibition. The following are some of the exhibits that are of interest to our readers:

W. M. CRANE & CO.,

838 Broadway, New York, make an extensive display of gas stoves. At the left of their exhibit, which extends for 20 feet, is a French range, adapted entirely for the use of gas in cooking. At the right end is, to all appearances, a brass gas grate, set attractively in a hardwood mantel. In the center of the exhibit is another hardwood mantel, which has a gas fire log resting on fire dogs. The exhibit consists of Perfect and Success gas ranges, and the Vulcan gas radiator, which combines the feat-

ures of a popular Leader stove, the Leader stove which is prominently distributed through the exhibit, the Gibbons gas broiler, and a varied line of cooking utensils adapted for use with gas.

THE WOLFF GAS RADIATOR MFG. COMPANY

of 164 Franklin street, New York, show their various forms of gas radiators, the fireplace heater which can be used the same as a Baltimore heater to warm the room above, being an attractive feature of the exibit.

THE HATCH CUTLERY COMPANY

of South Milwaukee, Wis., make a fine display of the Hatch patent bolt and washer, shears and scissors and automatic pocket knives, tinners' snips, Christie knives and Capewell's patent tack pullers. The exhibit is in charge of David Eastman, of 97 Chambers street, New York.

EDWIN A. JACKSON & CO.

50 Beekman street, New York, show three handsome mantels, one being of tile with one of their ventilating grates, finished in gilt and with a gilt fender and tile hearth. Another mantel is of wood and tile, with a terra cotta gas log resting on brass andirons. Another is of tile and wood, with a gas log and wrought iron dragon fire dogs. These are arranged in a half circle and present a very attractive appearance.

L. H. MACE & CO.,

117 East Houston street, New York, make a fine display of refrigerators and kitchen furniture. They have their Diamond, Leader, Royal and Excelsior refrigerators on exhibition, in which the circulation of cold air is the strong feature. They are giving out a souvenir in the shape of a refrigerator which is a money bank made of wood and painted to show all the trimmings of a full sized refrigerator. The suggestion is to save your pennies and buy a Mace refrigerator.

THE HEAT & ODOR EXTINGUISHING COMPANY

of 1293 Broadway, New York, made an exhibit of an adjustable heat and fireproof curtain, which forms a flue to carry off the heat and fumes of cooking. It is shown in connection with a Cort gas range made by J. H. Cort & Son, 320 Water street, and a Faultless double oven coal range, made by Graff & Co., 208 Water street, New York.

HEATING AND PLUMBING.

NEW WORK AND CONTRACTS.

DISTRICT INSPECTOR DYSON, Worcester, Mass., recently tested the heating apparatus in a Laurel street school building, Fitchburg, Mass., which was warmed by the Fuller & Warren Company's system, put in by the Jennison Plumbing Company. The result of the test was very satisfactory in every way.

JAMES DONOVAN has secured the contract for placing a steam heater in the McDonough House, at Middletown, Conn., and will use a Richmond sectional steam boiler.

THE CONTRACT for heating the new Presbyterian church at Clinton, Mass., has been awarded to the Hub Plumbing, Heating & Stove Company.

E. D. HORNBROOK & Co., Kansas City, Mo., have secured the contract, amounting to over $25,000, for the plumbing, heating and gas fitting in the new Union Depot being built at Portland, Ore., by the Northern, Union and Southern Pacific railroad companies. The gas and electric lighting fixtures are to be very handsome.

MUNDLOCH & YAGLE, Hancock, Mich., have just finished putting hot water heaters in James R. Dee's building, L. Hennes & Co.'s store and the St. Patrick's parsonage, at Houghton. They also have the contract for heating apparatus in the new convent and school. The latter will be connected with a 4-inch pipe from the plant in St. Patrick's Church.

E. H. BAGLEY of White River Junction, N. H., has a force of men at work on George H. Moore's new house, Newburg, putting in heating and lighting plants.

PHILLIPS & Co. of Niagara Falls, N. Y., are putting in the steam heating apparatus for the new business block of the Lewiston Avenue Improvement Association of that city. The building will have two No. 4 double Florida heaters. The same firm are replacing the hot water apparatus in the Erie passenger depot with a No. 45 Florida steam heater.

THE PHILADELPHIA BOARD OF EDUCATION'S Property Committee and Council's Committee on Schools recently opened bids for heating apparatus for the various new school houses and additions to old ones. The contracts were awarded as follows: The Davis & Gorman Company, for heating the new addition to the Lynd School, Twentieth section, $200; addition to Manayunk School, Twenty-first section, Philadelphia Steam Heating Company, $1547; heating and ventilating Whitehall School, Twenty-third section, Philadelphia Steam Heating Company, $3192; addition to Bellvue School, Twenty-eighth section, J. A. Welt, $460; heating and ventilating Robert Morris School, Twenty-ninth section, Philadelphia Steam Heating Company, $5383; heating and ventilating Bayard Taylor School, Thirty-third section, Thompson Brothers, $2272; Fox Chase School, Thirty-fifth section, T. T. Rockett, $400.

SCHOLL & SEMPLE bid $290 and secured the contract for remodeling the plumbing and closets in the court house at Youngstown, Ohio.

AT A SPECIAL TOWN MEETING recently held at Guilford, Conn., the sum of $1000 was appropriated for heating the new town hall with steam.

SEALED PROPOSALS will be received at the office of the Supervising Architect, Washington, D. C., until January 5 for low pressure return circulating steam heating and ventilating apparatus for the United States Post Office building at Ashland, Wis. Drawings and specifications may be obtained from the Supervising Architect at Washington, or at the office of the superintendent at Ashland.

S. F. LITTLEFIELD & Co., Wakefield, Mass., recently installed steam heating plants, using Exeter radiators, in the post office, G. A. R. Building and Jordan's drug store at the place named.

THE KEWANEE BOILER COMPANY, 96 Lake street, Chicago, have recently shipped the improved Haxtun boilers, as follows: Four No. 9½ for T. B. Leiter's flat building, Sixty-fifth street; one No. 4 for residence of D. Curtis, Loomis street; one No. 9½ for Theo. Jacobs Company; one No. 10½ for the Griefuhagen Building; one No. 9½ for new warehouse of the Wabash Railroad Company; one No. 12½ for Kenyon flat building.

THE AMERICAN RADIATOR COMPANY, 111 and 113 Lake street, Chicago, are to furnish the radiators used in the Union Depot, St. Louis, Mo.

AMONG THE CONTRACTS lately taken by John W. Mills, 100 Lake street Chicago, can be mentioned the following: Bolton heater for the residence of E. E. Kilmer, 5735 Indiana avenue; Capitol heaters for residences of Dr. N. S. Thomas, 2930 Lake Park avenue; Geo. L. Peterson, Pine Grove avenue; Adolph Dohl, 1241 Wolfrahm street; J. J. Lovett, Mont Clare, Ill., and A. B. Tallman, Brainard, Ill.

WILLIAM H. GRIFFIN has completed his contract for plumbing at the new Bancroft place, Second Beach, R. I., and has returned to Narragansett Pier.

THE CONTRACT between the city of Allentown, Pa., and Francis S. Mertz for the heating of the American hose house and Allen engine house and First Ward station house was signed recently, and Mr. Mertz began on the improvements at once. The Backus steam heating system will be put in the American house and station house and hot air in the Allen engine house.

TIMOTHY LYNCH of South Newmarket, N. H., is putting in a hot water heating apparatus in Arthur Caron's residence at Salmon Falls.

P. J. SWEENEY & Co. are putting a hot water heating apparatus in Selectman Daw's residence at North Andover, Mass.

HIGGINS & Co., Mount Vernon, N. Y., recently installed a Victor steam heating plant in the New Rochelle Bank and a No. 66 Victor and 1000 feet of radiation in the large residence of J. Henneberger.

ONE OF NEW YORK'S BUSIEST PLUMBERS is John Tucker of 45 East Twentieth street. He is doing the plumbing work in the Corn Exchange Bank Building, at William and Beaver streets, in the new Astor mansion at Sixty-fifth street and Fifth avenue, the residence of Mrs. Bruce Brown, Seventy-second street and Madison avenue; residence of P. T. Baiter, 149th street and St. Nicholas place; residence of Uriah Lott, 29 West Eighty-first street, and is also overhauling the plumbing work in the residence of Pliny Fisk, at Plainfield, N. J. Mr. Tucker is also making alterations at his Newport, R. I., shop, which will shortly be opened as a first-class plumbing emporium.

DURING the recent cold snap the trustees of the Children's Home, at Georgetown, Ohio, investigated the heating plant installed by G. N. Becker of that city. It is a W. H. Page Boiler Company's hot water plant with one of their special self-regulating devices so arranged that with a temperature of the water at the boiler of 164° all parts of the institution are kept at 70°. Commendation of the system, its operation and the workmanship is freely expressed.

THE ENGINEER of the Metropolitan West Side Elevated Railway Company of Chicago, selected the Mott Sunray heaters, manufactured by the J. L. Mott Iron Works, New York and Chicago, for heating the stations of the above road. The order was secured by C. M. Converse, who has charge of the heating department of the Chicago branch.

TIN PLATES.

A Tin Plate Interview.

From an interview with C. R. Britton of the Britton Rolling Mill Company, Cleveland, Ohio, published in a recent number of the Cleveland *Press*, we reprint the following:

"We began making tin plate in August, 1891, and know that we can and do produce a very superior article; in fact, almost too good to be profitable. The customers we secured when we first went into the business we have ever since held, and they include the large manufacturers and dealers here at home, and there is no better location in the country for tin plate works, as the local consumption of that product is enormous.

"The most unfortunate thing that can happen to a new and experimental industry like ours is to have it dragged into politics and covered with partisan mud. As a consequence of this, there has undeniably been a lot of prevarication on both sides of the tin plate question. For one, I aim to consider it from a purely business standpoint, and state only what I personally know to be facts. Here are some worth a second thought.

"In our tinning house to-day we have no machinery that was in use 18 months ago. It is all new, and not only that, but purely American, both in make and invention. We have not used a pound of foreign plate in a year and a half. We are getting our plate from Niles, Pittsburgh and other points. We have altogether discarded Welsh methods, and employ American labor only.

"For some time previous to last August we were closed down, or working but two or three days at a time, but receiving satisfactory assurances from the Ways and Means Committee of Congress that a specific instead of an ad valorem duty would be imposed on tin plate and that the Wilson tariff bill would not go into operation before October 1, 1894, we started up and are turning out $500 worth of tin and terne plate per day. . . .

"In the Wilson bill we are favored about 5 per cent. over sheet iron and relatively cannot, therefore, complain of unfair treatment. The changing of the duty on tin plate from an ad valorem to a specific one is so great an advantage to us that we would have had to shut up shop if subjected to the ruinous uncertainty inseparable from the former. There is not one tin expert in 100 who can determine the quality and value of tin plate from its appearance; consequently, it is impossible to lay an ad valorem duty upon it equally or equitably. Besides the amount of such duty would largely depend upon fluctuations in the foreign market price, and no man would dare to give a time order under such circumstances. With a specific duty of 1½ cents per pound, or any other amount, we always know just what we have to pay, as that goes by weight alone, and the state of the market cannot affect it. Consequently, in competing with foreign production all we have to do is to add to the known market value at any time the specific duty, and we then know precisely where we stand, and can gauge output and prices accordingly."

Tin Plate Litigation in England.

An interesting side light on the situation in the British tin plate trade is shown by the report given in the London *Iron and Steel Trades Journal* of a recent motion in the Court of Appeal of Great Britain. The firm of David & Howell, owning works at Taibach, South Wales, was recently dissolved, as the result of Chancery proceedings between the partners. The court ordered the partnership property to be realized, but Mr. Howell applied to Justice Stirling to defer the sale of the works until March next. This application was refused, and a week or two ago Mr. Howell applied to the Appeal Court, when his counsel stated that the point raised really turned on the probability that the Democrats in the United States of America would be able to obtain the repeal of the McKinley tariff. Since Justice Stirling's order the state of things had improved from the view taken by the appellant, inasmuch as the Democratic body had now brought before the Ways and Means Committee in the United States a bill which would modify the McKinley tariff to the extent that so far as regarded tin plates the proposed duty, if the bill were carried, would be about half the present amount. At present the trade was very much depressed. In 1890 alone the exports of tin plates from England were 420,000 tons, of which 320,000 went to the United States, but the McKinley tariff practically stopped all that trade. The profits of the partnership business of the plaintiff and defendant were, in 1891, upward of $43,200, whereas in 1892 they were only $12,960, and it was common ground of belief that if the McKinley tariff were repealed there would be an immediate improvement. If the new bill were carried, the date for it to come into operation would be March 1, and all he asked was that the sale might be postponed till after that date. The Lords Justices gave it as their opinion that they ought not to be asked to speculate as to what politicians in America might do, and declined to delay the sale.

SCRAP.

GUMMEY, SPERING & COMPANY, Philadelphia, Pa., have received an order for 250 boxes, 20 x 28, Pennsyl Old Method American terne plate, to cover the large buildings now being erected by the Harrison estate in Philadelphia. We understand that the demand for this plate, which is claimed to carry 40 pounds of metal per box of 112 sheets, has so largely increased that the firm are putting in additional pots at their works for its manufacture. The firm also make at their own works the Leominster brand.

A PATENT has been granted to Thomas H. Griffiths, a resident of Philadelphia, Pa., for an improvement in apparatus for coating tin and terne plates. The special feature consists in the means for subjecting the plates to a bath of oil. A tank of oil is provided above the pot, with a discharge spout emptying between the rollers and a valve controlling the flow of oil.

WE ARE ADVISED that the report that the plant of the United States Iron & Tin Plate Mfg. Company, Demmler, Pa., was entirely closed down is without foundation. While it is true that the plant is not being operated to full capacity, it is also a fact that at no time within the past three or four months have operations been entirely suspended. While the demand for sheets is very light at present this firm are doing a large business in tin and terne plate. As their tinning capacity is not large enough to consume their entire output of sheets it is necessary occasionally to run the sheet mills only half time.

THERE is but little improvement in the British tin plate trade mentioned in late advices. An upward movement in tin had added to the difficulties surrounding the struggling manufacturers in South Wales, as no corresponding advance had developed in the value of tin plates. The prospect of a reduction in the American tariff was a source of encouragement, but this was not taken as a certainty, and the possibility of a postponement of the lesser duty was entertained, serving to repress any undue haste on the part of the Welsh makers in starting up the mills. There is considerable distress still existing throughout the tin plate districts, it being computed by L. Richards, president of the Tin Plate Workers' Union, that of the 519 mills in the trade more than 200 were idle at the beginning of December. To remedy this state of things many suggestions were made, the most favored one being a month's stoppage and the strict limitation of 36 boxes to a shift. Stocks in sight are about half the quantity available at this time last year.

THE SHEET MILL of the Lalance & Grosjean Mfg. Company, Harrisburgh, Pa., is running steadily. Their product of black sheets, over and above those required for home consumption in the company's factory at Woodhaven, L. I., are disposed of to tin plate works for tinning purposes. An active demand for this material is reported.

The Columbian Desk Calendar, which is issued annually by the Pope Mfg. Company, of Columbia bicycle fame, is out for 1894, much improved in appearance. It is a pad calendar of the same size and shape as those of previous years, having a leaf for each day, but its attractiveness has been hightened by the work of a clever artist, who has scattered a series of bright pen drawings through its pages. It also contains, as usual, many appropriate and interesting contributions.

Representative Chickering has introduced a bill in Congress directing the Secretary of War to have surveys made for a ship canal from the great lakes to the Hudson River.

PLUMBING and GAS FITTING.

New York Trade School Day Classes.

The day classes for instruction in plumbing, carpentry, bricklaying and painting at the New York Trade School will open January 2, 1894. The number of applicants to the plumbing class is far in excess of previous years at this time, being now 84. The number that can be accommodated is 120. In the other classes the number is on an average with former years.

Washington Master Plumbers.

The Master Plumbers' Association of Washington, D. C., held their annual meeting recently at the Builders' Exchange, electing the following officers for the ensuing year. Joseph R. Quinter was chosen president, James Nolan, vice-president; Edward Mallett, Jr., secretary; James Cunningham, treasurer, and Charles Barrick, sergeant-at-arms. The induction into office of these men formed a conspicuous feature of the occasion.

After the meeting a banquet was held at Osborn and Hoban's *café* on Seventh street. Speeches were made by President Quinter, ex-President John Mitchell, Chief-Inspector Robinson and Edward J. Hannan. George McDerby continued with a discourse on the "Water Service of the District," Veteran Daniel Hannan told about "Plumbing in ye Olden Time" and E. S. Hutchinson treated "Social Intercourse in Trade." The remaining speakers were T. V. Noonan, J. C. McCubbin, E. G. Schafer, Robert Leich, Sr., and Thomas Somerville.

The invited guests were Capt. George McDerby, S. A. Robinson, Robert Leich, H. M. Woodward, R. G. Campbell, John Hyle, Edward Caverly, Frank Reed, C. J. McCubbin, Henry Walter, E. G. Schafer, E. S. Hutchinson, A. Ward, Jr., John Mitchell, Jr., M. Sullivan, John Curry and E. Ridgway.

Sanitary Precaution.

The San Francisco Sanitary League offers to the public the following practical suggestions:

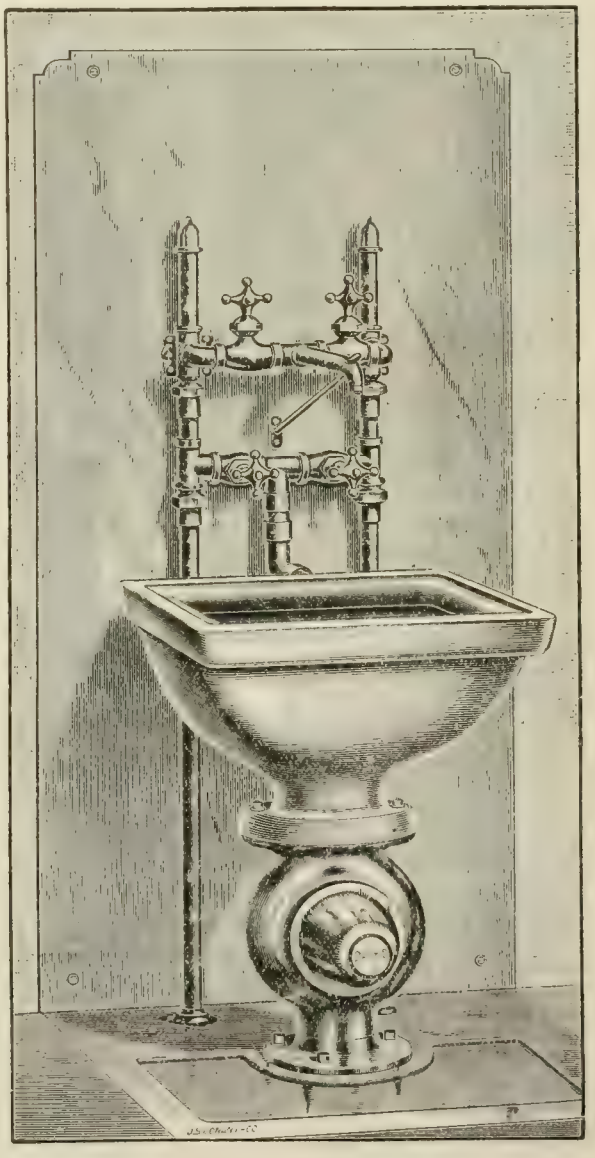
As partial security against bad sewerage and defective plumbing, the keeping closed, as a rule, the stopples in bowls and bathtubs; the keeping in a handy place a demijohn of lime water (6 ounces of chloride of lime to the gallon), and pouring a small quantity of the mixture into bowls and drains several times a day; the necessity of an adequate supply of outside air into the house night and day through open windows, placing a screen between the bed and window as protection from drafts.

The free use of sunshine, air and water as disinfectants; the burning by housewives of all garbage possible in stoves and ranges, thus obviating the necessity of its remaining any length of time about the premises.

Also the fumigation of rooms for the destruction of possible disease germs by burning sulphur on hot shovels; removing plants and birds, leaving the room closed for a time and then thoroughly airing it before occupancy.

Sanitas Slop Sink.

One of the handsome plumbing fixtures made by the Smith & Anthony Company, Boston, Mass., is the Sanitas slop sink shown in the illustration. The sink is furnished either in porcelain or enameled iron, provided with a flushing rim and arranged to use a 3-inch Sanitas brass trap, so that there is little danger of it becoming foul or clogged. It is arranged with hot and cold water fixtures, so that it can be flushed with hot water when desired. The upper portion of the fixture provides a strong extending spigot that will hold a pail while it is being filled. The cocks are of the compression character, and all of the fixtures are nickel plated.



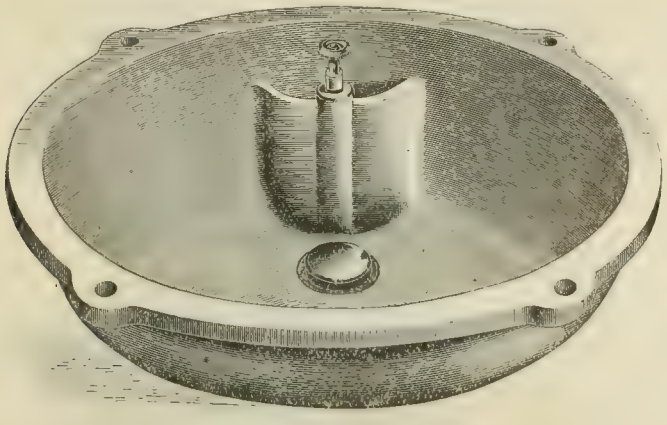
Sanitas Slop Sink.

A UTICA, N. Y., paper gives an account of the effect on unlicensed plumbers of the application of Chapter 602 of the New York State Statutes. Patrick E. Teefey, dealer in tinware, 130 Court street, was recently arraigned in the City Court before Judge Harvey for violation of the plumbing rules. Plumbing Inspector David McKeough made the complaint, as he found defendant had put in four traps in kitchen sinks This he had no right to do, as he had not been examined and had no license, and his work had not been done to comply with the plumbing rules adopted. Josiah Perry appeared for the city. Teefey pleaded guilty and paid a fine of

$5. The fine could have been more severe, but it being the first case of its nature in Utica, the Judge felt in a lenient mood.

The Complete Wash Basin.

Fred. Adee & Co., 90 Beekman street, New York, who manufacture plumbers' goods, are just introducing the Complete wash basin, which is a combination of basin and waste valve. The stopper and metal parts are brass, heavily nickeled. The basin is emptied by raising the stopper by means of the thumb piece seen in the cut. A slight lateral turn keeps it in that position, if desired, until released. If necessary to remove the stopper on account of obstructions, it may be turned to a given point, when it can be lifted out. The overflow is larger than the supply, and every part of the basin is in full view for cleansing, &c. The top is ground level so as to properly fit the slab, while nickeled brass fittings hold the basin securely in position.



The Complete Wash Basin.

TRAPS AND VENTS.

A COMMITTEE OF ARRANGEMENTS, with Col. George D. Scott for chairman and Edward Murphy for secretary, has issued invitations for a supper at Jaeger's on Saturday evening, December 23. This will be the occasion for tendering a testimonial from the Master Plumbers' Association of New York City to its esteemed president, Henry Gabay.

AS A RESULT of the recent controversy between W. E. D. Stokes of New York and the local Board of Supervisors at Yonkers, N. Y., Commissioner of Public Works Cooper, who is *ex officio* a member of the board, has given notice that at the next meeting he will offer a resolution amending the local regulations so that any plumber having a place of business in New York City, and having a certificate from the plumbing authorities of that city, shall have a certificate for Yonkers on passing an examination before the local board and paying the usual fee.

C. CARSON has opened a plumbing shop in the Harford Building, on East Main street, Middletown, N. Y.

ARTICLES OF INCORPORATION of the Iowa Construction & Mfg. Company were recently filed for record with the county recorder at Sioux City, Iowa. The incorporators are Albert Paige, John Flannigan and Harry Nobles, who also constitute the Board of Directors, from which the officers are to be elected. The company will engage in plumbing and steam fitting, and in the construction of water works and gas plants.

P. A. MCGUIRE & CO. is the style of a new plumbing firm who have recently embarked in business at 811 Broad street, Chattanooga, Tenn. M. J. Murphy is associated with the new concern.

ROSSMAN & BRACKEN, plumbers, 387 Lexington avenue, New York, are engaged in completing their contracts which have made the past year satisfactory in the amount of business transacted.

THE HAYSEED GAS BURNER, says a local paper, is the name of an invention by Clarence M. Kemp of Baltimore. He says the harder you blow at this burner the more stubbornly does the light refuse to go out, and if by chance it is puffed out by very strong lungs, the gas is immediately relighted automatically. It is designed particularly for use in hotels where gentlemen of rural training retire for one night's rest and arise in eternity while the coroner holds an inquest on the remains. We learn from Mr. Kemp that the burner, though perfected, is not yet on the market, but will probably be regularly manufactured within a few months.

THE STORE of W. H. Matlack, manufacturing plumber and gas fitter, at 423 West Jefferson street, Louisville, Ky., was recently badly damaged by fire and water. His loss, as reported, will amount to $6000, insured. He hoped to be able to begin work in the factory part at the usual time the next morning. The firm employ 29 men. The fire is thought to have been of incendiary origin.

JOHN WARDELL, Dunmore, Pa., late partner in the firm of Wardell & Palmer, has leased and is about to open a plumbing and gas fitting establishment in the empty store of Thomas Dansapaugh.

JAMESS MUIR, SONS & CO., 27 East Twentieth street, New York, are completing the work in the residence of Cornelius Vanderbilt, at Fifty-seventh street and Fifth avenue. This is said to be one of the handsomest pieces of plumbing work in the United States, a feature of which is two bathtubs carved from a solid block of Italian marble. Other fixtures in the house are in keeping with these elegant tubs, and were largely selected from the line of the J. L Mott Iron Works.

AT THE ANNUAL MEETING of the stockholders of the Hubbard Foundry & Machine Company, Warren, Ohio, the following trustees were elected for the ensuing year: J. W. Russell and Fred Russell, W. A. Loveless, J. Q. Veach and H. H. Hiscock. Only the foundry department of the plant is at present running, being engaged on a large order for sinks.

GEORGE P. KING & CO. are the latest plumbing, steam and gas fitting concern in Janesville, Wis. The partners are George P. King, who has a reputation for fine work, and Herbert E. Kent formerly in the employ of McVicar Brothers. Both young men are well known in Janesville.

THE BOARD OF HEALTH of Springfield, Mass., met in the Mayor's office recently and voted to have the new plumbing ordinance published in full. Plumbers' licenses were granted Edward S. Hanks, Edward D. Linnehan and William A. Henry.

AT A MEETING of the Master Plumbers' Association of Philadelphia, held on the 14th inst., a committee was appointed to meet the Highways Committee of Councils in regard to regulating permits for opening streets. The committee is composed of Wm. Harkness, W. S. Clark and A. M. Hicks. Among the routine business transacted at the meeting was the nomination of officers for election at the next meeting of the association.

THE HEAT CONTROL & PLUMBING COMPANY, LIMITED, is the name of a new concern established at 1721 Chestnut street, Philadelphia. J. C. Worthington is president, Levenus S. Kern secretary and treasurer, John Worthington manager of the plumbing department and O. L. Billings manager of the heating department. The company will undertake the heating of houses, public buildings, general plumbing work and the installation of electric lighting systems. They will also undertake the inspection and testing of plumbing and heating systems of all kinds. They propose to have a staff of men on hand at all hours, day or night, for repair work requiring immediate attention. They have been appointed the agents for Philadelphia for the sale of the Ridgway heater. As specialties they will manufacture and handle Billings' thermostat, thermorheostat and rheostatic governor. The company are at present employing 18 hands.

J. J. WADE & SON have moved their plumbing establishment from 298 to 276 Dearborn street, Monadnock Block, Chicago.

THE CRESCENT MFG. COMPANY, 281 Center street, Meadville, Pa., send out a batch of advertising circulars relating to some of the specialties that they are putting on the market. Those of particular interest to our readers are the Flexible Light Holder, a gas tube that can be bent in any direction and hold its position. There is also the Crescent Fire Mat and the Matchless Self-Lighting Gas Burners, all of which are illustrated and briefly described in the circulars.

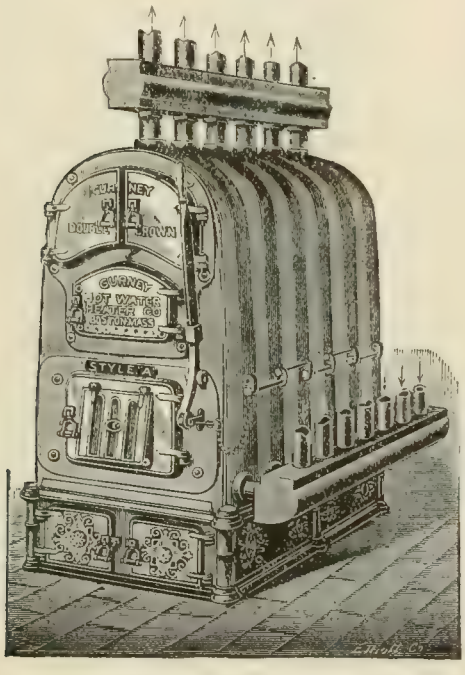
THE OHIO STATE MASTER PLUMBERS' ASSOCIATION will hold their annual convention in Toledo, February 13, 14 and 15.

THE PLUMBING ESTABLISHMENT of Wells & Hughes, Oskaloosa, Iowa, has been purchased by the Oskaloosa Plumbing Company. The new firm, under the management of I. W. Davis, have a new and complete stock of plumbing, gas, steam and hot water goods.

STEAM AND HOT WATER.

Gurney Style "A" Double Crown Heater.

The cuts introduced in this article illustrate the Gurney style "A" Double Crown hot water heater, which the Gurney Hot Water Heater Company of Boston, Mass., have recently added to their already well known line of hot water heaters and radiators. Previously they had only made two styles of this particular type of hot water heater—viz., style "B" and style "C"—their capacities ranging from 1200 to 600 feet of radiation. Fig. 1 is a general view of the heater and Fig. 2 is a broken view, showing internal construction.



Gurney, Style A, Double Crown Heater.—Fig. 1.—General View.

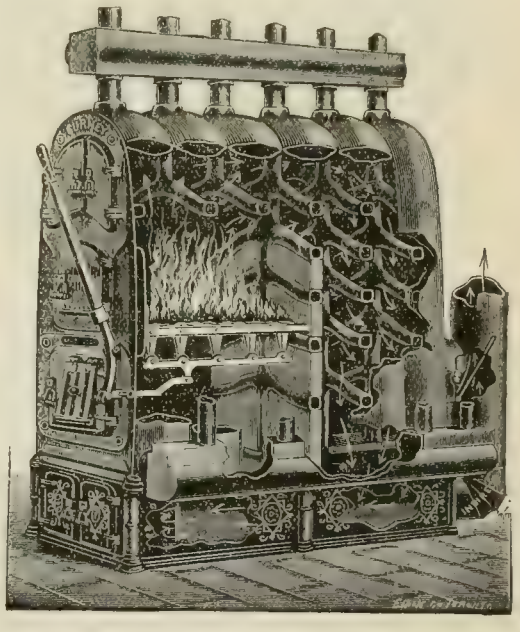


Fig. 2.—Broken View of Heater.

The style "A" differs from the style "B" and "C" in some few particulars. There is one return drum, as shown. The heater is made with a shell base and diving flue, having both direct and indirect draft. The position of the fire is at the top of the heater, similar to the two former styles, and it comes in contact with large heating surfaces directly over the fire. The general idea is carried out in this heater, as applied to their style "B" and style "C," with which the trade are familiar. This heater is made in three sizes and has capacities of 600, 800 and 1000 square feet of direct radiating surface, respectively.

HEATING NOTES.

The Wm. H. Page Boiler Company, Norwich, Conn., are just completing an addition to their plant, comprising a large foundry for making boiler castings, which will be ready for occupancy by February next.

We are indebted to B. H. Hillier & Co., New London, Conn., for a photograph of the Connecticut Odd Fellows House, at Fairview, which the above firm heated by a Richmond steam heater and Exeter radiators.

From the Globe Steam Heater Company, North Wales, Pa., we have received a 12 page catalogue of the Globe portable steam and hot water heaters and the Globe horizonal stationary steam heater. The various dimensions of the apparatus are given, as well as a rating of the radiation the different boilers will carry. The Globe adjustable pipe hanger, which is shown, can be taken off or put on after the pipe is in position and adjusted with ease. It is made for pipe from ¾ to 14 inches in diameter.

Jenkins Brothers, manufacturers of Jenkins valves and standard packing, will remove their Philadelphia branch from its present quarters at 21 North Fifth street to 117 North Fourth street.

Under date of December 11 Edward P. Bates, Syracuse, N. Y., issues a notice to the trade that the business of his Chicago office having proved unremunerative he has decided to close the same on January 1. Mr. Bates will continue in the steam and hot water heating business, with principal office at Syracuse, N. Y., where he will be pleased to correspond with former customers and to reply to new inquiries.

The trade are receiving an envelope bearing the stamp of official business of the United States Department of Agriculture, addressed to the Herendeen M'g. Company, Geneva, N. Y., inclosing a letter from William Saunders, horticulturist, &c., which is highly complimentary of No. 6½ Furman steam boiler, used in heating a greenhouse 26 x 130 feet.

The William H. Page Boiler Company, Norwich, Conn., have opened an office at 45 Dey street, New York, where a line of samples of Volunteer and All Right steam and hot water apparatus will be carried.

The Smith & Anthony Stove Company, 217 Lake street, Chicago, report a favorable trade in Hub water heaters for the past season. It is stated that their customers are well satisfied with the operation of the heaters regarding economy of fuel, circulation and ease of management.

The Farquhar Heating Company, 58 Dearborn street, Chicago, are furnishing Farquhar heaters for hot water heating in the residences of W. T. Block, 1628 Indiana avenue; E. D. Oliver, Harvey, Ill., and Cornelius Trompen, Roseland, Ill.

McMann & Taylor, 42 Cliff street, New York, dealers in steam fittings, plumbers' supplies, &c., have been made agents for this territory of the Eddy Valve Company. They will carry their goods in stock.

At the monthly meeting of the Board of Trade and Transportation in New York last week a report was adopted recommending a system of revenue marine as an adjunct to the United States navy.

Experiments with Gas Stoves.

Something over two years ago the management of the London *Lancet* appointed a special analytical sanitary commission to investigate and report upon the subject of smoke prevention and perfect combustion. The results of the work of this body were published in different issues of the paper named and attracted widespread attention. One of the reports—the third of the series—relates to gaseous fuel, including gas heating and cooking appliances, and covers a series of experiments with gas heating stoves which cannot fail to prove interesting to American readers. In connection with the report on this subject, the first instalment of which is given below, are two tables, showing the maximum and minimum consumption of fuel. These tables our readers will do well to preserve for use in connection with the conclusion of the article, which will be given in a later issue:

REPORT OF THE LANCET.

In previous articles we have explained the conditions necessary for the complete combustion of solid fuel or coal, and the conclusions to which our experimental investigations have led us may be briefly and opportunely recapitulated. We have shown that when bituminous coal is burned in the ordinary manner incomplete products are formed because heat is absorbed in effecting distillatory changes, and the volatile and gaseous products of these changes are cooled down considerably below the point at which they combine with oxygen. In addition to this, the products are mixed with a large proportion of inert nitrogen derived from the absorption of oxygen from the air which served to maintain the combustion of the lower strata of fuel. Thus it is that smoke consisting of visible gases (tarry compounds) and invisible gases (carbon monoxide, sulphureted hydrogen, hydrocarbons, &c) is formed and escapes unburnt into the air, representing a considerable waste of fuel and loss of heat. While, therefore, coal distills, and in doing so gives rise to complex products, coke or carbon is incapable of undergoing a similar change; for carbon, in burning, glows brightly and gives off the complete product of oxidation, carbonic acid, or if the oxygen is not in excess, then the incomplete product, carbon monoxide. This explains the steps in the combustion process taking place in the ordinary coal fire, where the coal on ignition gives off first inflammatory gases, part of which is burnt and part unburnt, and then when they cease to be evolved the residual coke or cinder glows without flame and burns without smoke. In other words, the red cheery appearance of a fire is due to the combustion of carbon (coke or cinders), and the luminous flames are due to the combustion of hydro-carbon gases. It is, therefore, the bituminous nature of coal or its property of yielding gases on heating which gives rise to considerable difficulties in effecting the perfect combustion of this form of fuel. These difficulties, however, great as they are, may be surmounted, as we have shown, when proper consideration is given to the conditions under which the perfect combustion of coal may be insured, and by modifying the structure of the fireplace according to these requirements.

GAS FOR HEATING.

Of late years very considerable attention has been directed to the application of gas for heating purposes, the main argument in favor of gas fuel being that in burning it produces nothing but complete products of oxidation, as, unlike solid fuel, it must in the nature of things be constantly surrounded with a plentiful supply of oxygen, which supply can never be barricaded or interfered with by preliminary changes. The hope has been again and again expressed, therefore, that the universal adoption of gaseous fuel would prevent the formation of unhealthy and smoke-laden fogs. It is obvious that whatever remedy is at hand it must of necessity be drastic. Whether it be gas, coal, or even electricity—and considerable efforts are being made to render electricity available for both heating and cooking purposes—the outlay, expense and trouble involved in the introduction of any new system must prove a temporary burden on the consumer. An important question to decide, therefore, is which of the systems of heat production at present available is most effectual, economic or hygienic in its working, and which would be the most convenient to adopt for general employment. The latter is manifestly a question which can only be dealt with satisfactorily by Imperial legislative inquiry, while it is certainly beyond the province of an article of the present character. All we can undertake is to point out the advantages and disadvantages of the systems at hand, founding our conclusions on the results of careful experimental inquiry. Having proceeded so far in demonstrating how practicable a system is, and more particularly how effectual it is likely to prove in minimizing the discomforts and alleviating the evils to health arising from the smoky outpourings of London's vast forest of chimneys, we may stop and leave the rest to those of our legislators whose duty and concern it is to watch over the health and well being of the people. In the present article, therefore, we propose to record our experience with gas as fuel both for heating and cooking purposes, and to publish the result of what really amounts to a scientific investigation in which the health question has been steadily kept in view, and which has absorbed much of our time and attention during the last twelve months.

COAL GAS INDUSTRY.

So long as the supply of coal is maintained it is certain that coal gas will be available as fuel. There is, therefore, no argument more in favor of the one or the other system that can be based on the question of supply; but, in view of the increased demand for gas for purposes other than illuminating, it is important to ascertain how far our producing centers are in a position to meet and cope with the enormously increased consumption of gas which its employment as fuel would entail. On the other hand, new methods of lighting may lessen the demand for lighting purposes, and to some extent, although we venture to think to a very slight extent, may balance the increasing needs of a supply for heating purposes. Judging from the steadily increasing employment of gas for both cooking and heating purposes which has taken place during the last decade, and bearing in mind, also, the fact of the great improvements that have been effected in the construction of gas fires and cookers, further improvements being almost a matter of daily occurrence, we are inclined to the opinion that, while there will be little diminution in the quantity of gas at present supplied for lighting, there will be a considerable quantity required over and above the present output for heating and cooking. It is important, therefore, to determine whether the gas works of London would be equal to such an increased production of gas were this increase demanded. Information of this kind can only be satisfactorily obtained from an inspection of one of the large gas manufacturing centers itself. By the courtesy of the Gaslight & Coke Company we were supplied with some interesting information on this point, and our Commissioners were permitted to visit their well known works, situated some 8 miles from the metropolis, yet, nevertheless, the largest station supplying gas to London. There are no finer works in regard to site and construction than the Beckton Gas Works on the banks of the Thames, where there is accommodation for large steamers to come alongside the wharves to discharge coal and other materials and to receive coke and other products.

At Beckton the gas is not stored in large bulk, but it is pumped through two 48-inch mains supplying gas holders in various parts of the metropolis. It is interesting to add that part of the gas manufactured in Beckton is conveyed to a district 14 miles distant. The Gaslight & Coke Company "carbonize" no less than 2,000,000 tons of coal a year, of which 1,000,000 tons are carbonized at Beckton. This represents an average of about 6000 tons a day, equal to the production of 60,000,000 cubic feet of gas per diem, or 20,000,000,000 cubic feet per annum; and to distribute this enormous volume of gas there are laid down in London streets nearly 2000 miles of main, exclusive of services and of other companies' supply. Concerning statistics, the following particulars, kindly placed at our disposal by the Gaslight & Coke Company's distributing engineer, furnish a striking and complete answer to the question as to whether the gas companies would be equal to the task of supplying an increased volume of gas, were it demanded by the application of gas for heating and cooking purposes. On Tuesday, December 1, 1891, with the thermometer at 46° F., the consumption of gas was 82,000,000 cubic feet; on Thursday, the 17th, with the thermometer at 37° the consumption was 92,000,000 cubic feet. Then suddenly a fog set in, and on Friday, the 18th, with the thermometer at 26°, no less than 118,000,000 cubic feet were required, and on the following Tuesday as much as 128,000,000 cubic feet (a record output)—that is to say, some 50,000,000 cubic feet of gas above the normal daily winter demand — an addition nearly equal to the daily average supply. If this enormous increase can be successfully grappled with at a single day's notice and maintained for several days (it is often only a few hours' notice, for there are no means of ascertaining the precise moment when fog appears, or when the temperature will suddenly fall), it is evident that even the existing plant, both manufacturing and distributing, is equal to the increasing requirements necessitated by the application of gas for purposes other than those of lighting. Moreover, by a system of high pressure services extending over the company's area, the ordinary pressure supplied to the consumer being

regulated from the high pressure mains by means of governors, the supply is constantly maintained even when a largely increased volume is demanded, to the introduction of novel systems, and none the less is it so when the proposal is made to interfere with the time honored system of burning coal. The English mind as to render the substitution of invisible sources of heat quite out of the question. Hence the failure to introduce into this country the coke

TABULATED RESULTS OF EXPERIMENTS WITH VARIOUS GAS HEATING STOVES.

MAXIMUM CONSUMPTION.

1	2.	3.		4.	5.	6.	7	8	9.	10.			11.
Stove under test.	Cubic ft. of gas consumed per hour.	Gas pressure in inches of water.		Mean heating effect in room in 1 hr. (deg. F.).	Max. temp. 1 ft. in front of fire (deg. F.).	Cost per hour.	Composition of gases from glowing fuel (per cent.).	Composition of gases from chimney (per cent.).	Composition of gases issuing from burners (per cent.).	Effect on air of room judged from increase of CO_2. Parts per 10,000.			Observations.
		Meter	Burner							CO_2. Before	CO_2. After.	CO_2. Incr'se	
A. Clay-ball fuel; radiating stove.	.46	1.8	1.4	6°	160°	1.65*d.*	O = None CO_2 = 6.6 CO = 7.2 HC = 0.3 H = 7.6 N = 78.3	O = 16.2 CO_2 = 2.4 — — — N = 81.4	Air = 70 Coal gas = 30	5.2	6.8	1.6	Radiant heat only.
B. Clay-ball fuel; radiating stove.	.52	1.7	1.5	8.5°	152°	1.87*d.*	O = None CO_2 = 5.9 CO = 6.3 HC = 0.3 H = 7.0 N = 80.5	O = 16.0 CO_2 = 1.7 — — — N = 82.3	Air = 6.54 Gas = 34.6	5.1	6.85	1.75	Radiant heat only.
C. Clay fuel; radiating stove.	.50	1.9	1.6	9.5°	145°	1.80*d.*	O = None CO_2 = 5.0 CO = 8.0 HC = 0.3 H = 5.4 N = 81.3	O = 15.0 CO_2 = 2.4 — — — N = 82.6	Air = 66.5 Gas = 33.5	6.2	8.4	2.2	Radiant heat only.
D. Asbestos fiber with heating chamber.	.40	2.0	1.7	9°	123°	1.44*d.*	O = 3.6 CO_2 = 7.3 CO = 1.0 HC = None H = 2.0 N = 86.1	O = 14.0 CO_2 = 4.2 — — — N = 81.8	Air = 71.0 Gas = 29.0	4.0	4.62	0.62	Radiant heat and heat conveyed by current of warmed air.
E. Clay fuel with heating chamber.	.44	1.9	1.6	10°	175°	1.58*d.*	O = None CO_2 = 3.5 CO = 10.3 HC = 0.5 H = 10.2 N = 75.5	O = 14.8 CO_2 = 3.0 — — — N = 82.2	Air = 70.0 Gas = 30.0	5.3	7.0	1.7	Radiant heat and heat conveyed by current of warmed air.
F. Clay-ball fuel with heating chamber.	.60	1.9	1.6	9	180°	2.16*d.*	O = None CO_2 = 9.3 CO = 1.3 HC = None H = 1.7 N = 88.7	O = 10.6 CO_2 = 6.6 — — — N = 82.8	Air = 70.0 Gas = 30.0	4.50	6.50	2.0	Radiant heat and heat conveyed by current of warmed air.
G. Iron trellis with heating chamber.	.50	2.0	1.8	9°	160°	1.80*d.*	O = None CO_2 = 8.0 CO = 3.0 HC = None H = 2.4 N = 86.6	O = 6.0 CO_2 = 7.5 — — — N = 86.5	Air = 70.0 Gas = 30.0	4.0	5.15	1.15	Radiant heat and heat conveyed by current of warmed air.
H. Iron trellis with heating chamber.	.38	1.7	1.4	8°	138°	1.36*d.*	O = None CO_2 = 9.3 CO = 2.0 HC = None H = 1.6 N = 87.1	O = 4.4 CO_2 = 7.0 — — — N = 88.6	Air = 71.0 Gas = 29.0	5.3	7.4	2.1	Radiant heat and heat conveyed by current of warmed air.
I. Clay-ball fuel with heating chamber.	.53	1.7	1.4	9°	160°	1.90*d.*	O = None CO_2 = 6.5 CO = 4.3 HC = 0.3 H = 4.7 N = 84.2	O = 14.2 CO_2 = 3.3 — — — N = 82.5	Air = 70.5 Gas = 29.5	4.0	5.4	1.4	Radiant heat and heat conveyed by current of warmed air.
K. Clay-ball fuel; radiating stove; 4 burners with taps.	.43	2.1	1.9	8°	150°	1.54*d.*	O = None CO_2 = 5.0 CO = 10.6 HC = 0.5 H = 10.8 N = 73.1	O = 12.4 CO_2 = 4.0 — — — N = 83.6	Air = 63.0 Gas = 37.0	4.0	4.34	0.34	Radiant heat only.
L. Clay-ball fuel; radiating stove with heating chamber; 6 burners with taps.	.50	2.1	1.8	11°	180°	1.80*d.*	O = None CO_2 = 6.6 CO = 9.6 HC = 0.3 H = 7.2 N = 76.3	O = 16.2 CO_2 = 1.8 — — — N = 82.0	Air = 64.0 Gas = 36.0	4.2	5.75	1.55	Radiant heat and heat by convection
M. Iron trellis with heating chamber.	.40	2.1	1.9	12°	170°	1.44*d.*	O = None CO^2 = 6.6 CO = 6.0 HC = 0.2 H = 7.2 N = 80.0	O = 6.6 CO_2 = 7.4 — — — N = 86.0	Air = 75.0 Gas = 25.0	4.55	6.80	2.25	Radiant heat and heat conveyed by current of warmed air.
N. Asbestos fiber; radiating stove.	.39	1.9	1.8	5°	132°	1.40*d.*	O = None CO_2 = 4.8 CO = 9.2 HC = None H = 6.3 N = 79.7	O = 15.6 CO_2 = 2.4 — — — N = 82.0	Air = 70.0 Gas = 30.0	4.9	6.0	1.10	Radiant heat only.
O. Asbestos fiber; radiating stove	.40	1.9	1.8	5°	125°	1.44*d.*	O = 2.4 CO_2 = 8.0 CO = 1.2 HC = None H = 2.2 N = 86.2	O = 13.6 CO_2 = 4.0 — — — N = 82.4	Air = 73.0 Gas = 27.0	5.3	5.8	0.5	Radiant heat only.
P. Condenser stove; atmospheric ring burner.	.16	2.3	2.1	10°	152°	0.57*d.*	—	O = 5.0 CO_2 = 7.3 N = 87.7	—	5.2	8.0	2.8	Condensed fluid after four hours' burning measured 7½ oz., and contained 0.0425 NH_3 and 0.17 per cent. SO_3.
R. Coal fire.	2 lb. per hr.	—		5°	145°	.31*d.*	O = None CO_2 = 15.8 CO = None HC = 4.0 H = 10.0 N = 70.2	O = None CO_2 = 10.3 HC = 0.3 CO = 0.7 H = 11.0 N = 77.7	—	6.1	7.1	1.0	Radiant heat only.

* Temperature of ascending current. *Note.*—HC indicates unsaturated hydrocarbons.

GAS FIRING.

Present Types.—Mere sentiment frequently constitutes a powerful obstacle hearth, with its cheery, bright, incandescing fuel, will ever be associated with the comforts of the English home—an association so deeply rooted in the stove, the closed combustion stove used on the Continent and other places, and other appliances, which are effective enough as regards heat and fuel econ-

omy, as well as combustion, but whose dead, dull, cheerless blackness has operated decisively in preventing their adoption in English homes. With gas fently see, he has more or less successfully attained. In the present inquiry we have confined our attention to the gas fires, in the structure of which the is thus directly utilized. But in by far the majority of stoves a form of indestructible fuel, as clay, asbestos or iron, is maintained at a cheerful glow

TABULATED RESULTS OF EXPERIMENTS WITH VARIOUS GAS HEATING STOVES.—*Continued.*

MINIMUM CONSUMPTION.

1. Stove under test.	2. Cubic ft. of gas consumed per hour.	3. Gas pressure in inches of water. Meter.	Burner.	4. Mean heating effect in room in 1 hr. (deg. F.).	5. Max. tempt. 1 ft. in front of fire (deg. F.).	6. Cost per hour.	7. Composition of gases from glowing fuel (per cent.).	8. Composition of gases from chimney (per cent.).	9. Composition of gases issuing from burners (per cent.).	10. Effect on air of room judged from increase of CO_2. Parts per 10,000. CO_2. Before	CO_2. After	CO_2. Incr'se	11. Observations
A. Clay-ball fuel; radiating stove.	25	2.1	0.4	4°	104°	0.9*d.*	O = 4.93 CO_2 = 8.39 CO = None HC = — H = — N = 86.68 O = 3.0	O = 17.06 CO_2 = 1.09 — — — N = 81.85 O = 15.0	Air = 70.0 Gas = 30.0	4.7	4.9	0.2	Radiant heat only
B. Clay-ball fuel; radiating stove.	24	2.1	0.4	4°	104°	0.86*d.*	CO_2 = 9.0 CO = None HC = " H = " N = 88.0 O = 8.0	Co_2 = 0.9 — — — N = 84.1 O = 17.9	Air = 60.0 Gas = 40.0	4.5	4.75	0.25	Radiant heat only.
C. Clay fuel; radiating stove.	25	1.9	0.4	5°	120°	0.90*d.*	CO_2 = 6.5 CO = None HC = " H = " N = 85.5 O = 2.2	CO_2 = 1.3 — — — N = 80.8 O = 14.6	Air = 65.0 Gas = 35.0	4.1	4.2	0.1	Radiant heat only.
D. Asbestos fiber with heat-chamber.	16	2.2	0.4	4°	100°	0.57*d.*	CO_2 = 9.4 CO = 0.5 HC = None H = " N = 87.9 O = None	CO_2 = 1.8 — — — N = 83.6 O = 6.6	Air = 71.0 Gas = 29.0	4.0	4.0	Nil.	Radiant heat and heat by convection.
E. Clay fuel with heating chamber.	21	1.9	0.4	5°	120°	0.75*d.*	CO_2 = 9.8 CO = 2.0 HC = None H = 1.0 N = 87.2 O = None	CO_2 = 7.2 — — — N = 86.2 O = 7.0	Air = 70.0 Gas = 30.0	5.0	5.3	0.3	Radiant heat and heat by convection.
F. Clay-ball fuel with heating chamber.	22	3.1	0.4	5°	120°	0.79*d.*	CO_2 = 7.3 CO = 4.3 HC = None H = 3.9 N = 84.5 O = None	CO_2 = 6.8 — — — N = 86.2 O = 8.6	Air = 70.0 Gas = 30.0	4.3	4.4	0.1	Radiant heat and heat by convection.
G. Iron trellis with heating chamber.	20	2.1	0.4	5°	112°	0.72*d.*	CO_2 = 8.5 CO = 0.5 HC = None H = 3.0 N = 88.0 O = 0.2	CO_2 = 4.2 — — — N = 87.2 O = 8.7	Air = 71.0 Gas = 29.0	4.0	4.0	Nil.	Radiant heat and heat by convection.
H. Iron trellis with heating chamber.	20	2.3	0.4	5°	102°	0.72*d.*	CO_2 = 9.6 CO = 0.2 HC = None H = 1.4 N = 88.6 O = None	CO_2 = 3.8 — — — N = 87.5 O = 15.2	Air = 70.0 Gas = 30.0	4.1	4.2	0.1	Radiant heat and heat by convection
I. Clay-ball fuel with heating chamber.	26	2.0	0.4	4°	93°	0.93*d.*	CO_2 = 9.4 CO = 3.2 HC = None H = 0.9 N = 86.5	CO_2 = 2.0 — — — N = 82.8	Air = 68.5 Gas = 31.5	4.5	4.7	0.2	Radiant heat and heat by convection
K. Clay-ball fuel; radiating stove; 4 burners with taps.	12	2.1	2.0	3°	84°	0.43*d.*	—	—	Air = 63.0 Gas = 37.0	3.95	4.0	0.05	One burner only alight; radiant heat only.
L. Clay-ball fuel; radiating stove with heating chamber; 6 burners with taps.	7	2.2	2.2	2.5°	70°	0.25*d.*	—	—	Air = 64.0 Gas = 36.0	3.99	4.0	0.01	One burner only alight; radiant heat and heat by convection.
M. Iron trellis with heating chamber.	20	2.1	0.4	5°	120°	0.72*d.*	O = None CO_2 = 6.0 CO = 9.4 HC = 3.3 H = 7.5 N = 76.8 O = None	O = 14.8 CO_2 = 3.2 — — — N = 82.0 O = 15.0	Air = 70.0 Gas = 30.0	4.24	4.25	0.01	Radiant heat and heat by convection
N. Asbestos fiber; radiating stove.	18	1.9	0.4	2°	11°	0.64*d.*	CO_2 = 5.2 CO = 9.4 HC = None H = 5.6 N = 79.8 O = 7.7	CO_2 = 2.8 — — — N = 82.2 O = 15.4	Air = 70.0 Gas = 30.0	4.4	4.9	0.5	Radiant heat only.
O. Asbestos fiber; radiating stove.	20	2.1	0.4	3°	90°	0.72*d.*	CO_2 = 4.3 CO = 3.4 HC = None H = 9.2 N = 79.4	CO_2 = 2.8 — — N = 18	Air = 73.0 Gas = 27.0	5.0	5.3	0.3	Radiant heat only.
P. Condenser stove; atmospheric ring burner.	6.2	2.2	0.4	2°	—	0.22*d.*	—	O = 15.5 O_2 = 2.6 N = 81.9		5.0	5.8	0.8	Heating effect chiefly by convection and the heat of combustion products.
R. Coal fire.	—	—	—	—	—	—	—	—	—	—	—	—	—

Note.—HC indicates unsaturated hydrocarbons.

as fuel, however, any objection to this character cannot obtain, as, while perfect combustion is secured, the fire may be made to approach the glowing coal fire so closely in appearance as to deceive even the keen observer. This has been the aim, indeed, of the gas stove manufacturer, which, as we shall pres- atmospheric or Bunsen burner is an essential feature. Gas fires of this description afford either radiating heat, convective heat, or both. In some forms there is no fuel; the gas is simply burned and the heat of combustion carried away by the products and partly by heat currents of ascending air, and by the heat of the almost invisible Bunsen flame. It is well known, of course, that ordinary luminous flames could not be used for heating fuel, as the introduction of a cold body into a luminous flame results in a considerable deposition of soot. In the stoves tested there were three varieties of fuel used

—clay ball fuel (with certain modifications), asbestos fiber and iron trellis. In stoves provided with a chamber at the back a current of air passes over the heated surfaces, becomes warmed, and then mixes with the air of the room. In other forms the heat is simply radiated from the glowing fuel. The installation of gas firing into a house, however, does not necessarily involve either a new stove or the removal of existing arrangements, as an ordinary fire place can readily be filled with fuel and fitted with atmospheric burners. In the accompanying tables, embodying the experimental work carried out, a short description of each stove under test is given.

EXPLANATION OF TABULATED RESULTS.

The quantity of gas consumed in a stove, unless it is fitted with governors or regulators, depends, of course, upon the pressure of gas from the main acting upon the burners. We have, therefore, tested the stoves both under maximum and minimum conditions, the former representing the full pressure of gas leaving the meter in a $\frac{5}{8}$ inch pipe, the pressure varying from 1.4 to 2.1 inches, while in the latter case it was found that a safe working minimum was 0.4 inch. By a safe minimum is meant the smallest quantity of gas that could be burned in a stove without fear of "lighting back" or blowing out (*vide* Bunsen Burner). The gas was measured through a Parkinson meter, which had been previously tested, sealed and stamped at the City of London Meter Testing Station. The numbers attached to the columns in the table make reference easy. We may describe them *seriatim*.

Column 1 gives a brief description of the kind of stove under test.

Column 2 records the consumption of gas in cubic feet in one hour, excepting in the case of the coal fire, where the number of pounds consumed in one hour is given.

Column 3 indicates the pressure of the supply and the pressure acting on the burner.

Column 4 gives in degrees Fahrenheit the mean heating effect on the air of the room in one hour. (It should be mentioned in this connection that in order to make really comparative determinations the starting temperature was in all cases approximately the same, from 55° to 57° ; and, moreover, the room being situated at the top of the building, so that the roof and two walls were exposed to the outside, there was no appreciable difference between the external and internal temperature. The experiments made with a view of ascertaining the heating effect of the stoves were not made in hot or extremely cold weather, but when the temperature in the morning was found to be within a degree of the starting point of preceding trials.) The space of the experimental room was 1080 cubic feet.

Column 5 gives the temperature registered by a thermometer placed 12 inches in front of the fire and immediately opposite the centre of the fuel. In one case, however (stove P), it is the heat of the ascending current of air.

Column 6 gives the cost of gas per hour, taking as an average price 3 shillings per 1000 cubic feet. In other calculations coal is taken to be worth 25 shillings a ton.

Column 7 shows the composition of the gases in the center of the fuel. The results are of special interest as indicating the changes that go on during combustion.

Column 8 conveys the information at once whether combustion is complete, for the gases occurring in this column should consist of nothing but carbonic acid, nitrogen, and the external air induced to flow up the flue by convection.

Column 9 shows the proportion of air mixed with the gas before burning, a mixture effected by the injecting action of the gas issuing from a small jet into the Bunsen tube, which is open to the air at the bottom.

Column 10 is interesting in marking at once any defective action of the stove as exhibited by an undue increase of carbonic acid in the room. Considering that carbonic acid is the chief complete product of combustion, we may take the presence of this body to indicate the extent of contamination from other products (carbon monoxide, &c.). The results are expressed in parts per 10,000, the normal amount existing in air approximating to 4. It is essential to state that the doors and windows of the room were closed in the ordinary sense during the whole time of the experiment, but no precautions were taken to prevent the ingress of air through window and door crevices, so that the conditions were rather unfavorable to the stove and such that would not exactly obtain in the dwelling room. Contamination arising from experimenters breathing the air of the room was, as far as possible, avoided.

Column 11 is reserved for observations where they are justified.

RESULTS OF TESTS.

The results yielded by the various gas fires under test may now be dealt with, and in so doing comparisons may be drawn, defects pointed out, and improvements, where desirable, indicated.

Stove A.—A good average example of an efficient stove fitted with clay ball fuel, warming the room satisfactorily by radiant heat only. No smell could be detected in the room, nor was there any indication of vitiation of the air on chemical examination. There were no incomplete products of combustion in the flue.

Stove B.—A similar stove to *A*, but consuming some six feet more gas per hour, the cost showing a slightly corresponding increase, which, however, is compensated for by greater heating effect in the room. The increase of carbonic acid was inappreciable, while the composition of the gases in the flue was satisfactory. It is to be noted, also, that the burner of this stove produces a gaseous mixture in which the proportion of gas to air is greater.

Stove C.—A good, economical, radiating stove; combustion products satisfactory. There was, however, distinct but not important increase of carbonic acid in the air, arising probably from the fuel obstructing the flames.

Stove D.—This stove heats the room both by convection and radiation and is therefore very economical as regards heating effect, 40 feet of gas raising the temperature 9° while at minimum working—that is, for 16½ feet consumed the air was warmed 4°. The carbonic acid in the air after one hour's working was practically nil, and the proportion of gas to air effected by the burner was satisfactory.

Stove E.—Similar to *D*; a radiating and heat current producing stove. Heating effect, therefore, high, consumption being 44 feet (4 feet more per hour than *D*), while air and gas were in suitable proportion, but the carbonic acid in the air, though insignificant, was higher. The products of combustion in the flue were complete.

Stove F.—This stove under full pressure of gas performs a somewhat extravagant consumption, which is not balanced by a corresponding heating effect. The flames were very long and occasionally protruded in front of the dome at the top of the stove, an occurrence which accounts for the distinct though small increase of carbonic acid in the air. The stove gives better results accordingly when worked at minimum pressure.

Stove G.—A stove fitted with iron trellis, giving feeble radiant heat, but the heating effect arising from warmed air was satisfactory. There was little increase of carbonic acid in the air after one hour's working of the stove. The flames were but slightly impeded, owing to the nature of the fuel. There was absolutely no increase of carbonic acid at minimum working. It works economically also as regards heating effect when the supply of gas is properly regulated.

Stove H.—Another type of stove with iron trellis, heated by atmospheric burners. As regards the amount of gas consumed the stove is very economical in relation to the degree of heat produced in the room, although a slight increase in carbonic acid points to some small defect, such as interference to the passage of the flame, which, however, is remedied when the pressure is reduced. The radiated heat is feeble, the heat being derived chiefly by means of a warm current of air passing through a chamber at the back.

Stove I.—Heat from this stove mainly radiated from glowing clay-ball fuel. Moderately economical ; combustion products perfect; small effect on air; proportion of gas to air satisfactory.

Stove K.—This stove is provided with four separate burners, an arrangement which offers a very distinct advantage of regulating the heat almost to a degree. It produces a very satisfactory degree of temperature in the room, derived exclusively from heat radiated from glowing clay-ball fuel, while its effect upon the air leaves little to be desired. A glance at the table will show that it is economical and that the products of combustion are complete. The rate of consumption in this stove can be reduced to 12 cubic feet per hour, the amount consumed by one burner, the heating effect of which is 3°.

Stove L.—This is a similar stove to *K*, but larger and fitted with six burners and provided with a heating chamber. For the amount of gas it consumes an excellent heating effect is obtained. The carbonic acid is slightly increased, arising from the fuel offering an undue obstruction to the flame. The stove may be reduced to one burner, burning 7½ cubic feet per hour, costing one farthing and producing 2½° increase in temperature.

Stove M.—This is a metal fuel stove similar to *G* or *H*, but having no chamber ; the heat produced in the room is, therefore, entirely radiant. Its heating effect is very great, considering the quantity of the gas consumed ; but through some cause, as with the stove *H*, there is a distinct increase of carbonic acid in the air after an hour's working. It is satisfactory, however, in all respects when attention is paid to the regulation of the supply (*vide* Minimum Working).

Stove N.—In this stove the Bunsen flame plays upon the asbestos fiber. There is, therefore, but small impediment to the flame, and the carbonic acid in the air shows little increase. From the nature of the fuel considerable heat is lost by traveling up the chimney, the

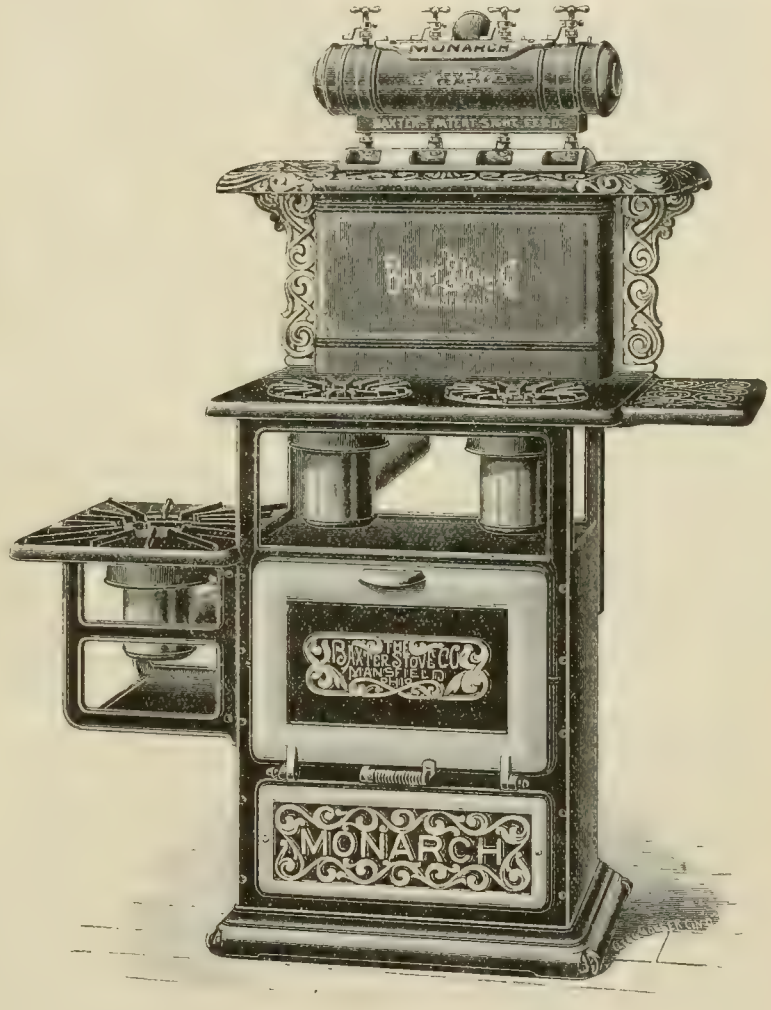
radiating effect comparing very unfavorably with clay ball fuel. Thus, for 39 feet consumed 5° is the effect. The products of combustion were complete.

Stove O.—Stove fitted with asbestos fiber of the same type as *M*, producing similar results, but showing a distinct improvement as regards leakage of carbonic acid in the air. It gives very satisfactory results at minimum working.

Stove P.—This stove produces the best results as regards heating effect, but the chief product of combustion, carbonic acid, is wholly discharged into the air. Thus the carbonic acid is raised from 5 2 to 8 parts per 10,000 in one hour, while for the small consumption of 16 cubic feet the room is heated through no less than 10°. The stove, in fact, is of the condenser type, in which the products of combustion pass through a length of tubes in which the moisture formed condenses, carrying with it the products of the oxidation of sulphur. A tray is provided at the foot of the stove to catch this water, which on analysis is found to contain the sulphur in the form of sulphuric acid, with some ammonia present as sulphate. The stove is especially applicable in cases where a flue is inconvenient or impossible. While, of course, the carbonic acid resulting from the combustion of the hydro-carbons of coal gas tends to vitiate the air, we cannot fail to approve of the ingenious device by which practically the deleterious sulphur products are removed. Although efficient for heating rooms, it cannot claim to present a cheerful appearance, a drawback to which we have already alluded, but some attempt has been made to remove this objection by the adoption of a luminous burner and placing in front of the flame a red glass window. The stove we tested, however, was fitted with an atmospheric burner.

Stove R (coal fire).—In this experiment coals were burned in a grate, immediately in front of which the stoves just described were tested. It may be urged that the comparison of its heating effect is hardly a fair one, because the coals were burning immediately under the chimney, while in the gas stove the fire was situated some eight inches toward the front; but on reflection it will appear that these conditions were, after all, such as would obtain in actual practice. Coals must be burned immediately under a flue, but a gas stove may project a short distance into the room. There is thus a gain derived from the fact that in the combustion of coal a large proportion of the heat is lost up the chimney. Where, however, a gas fire is fitted to an ordinary fire grate the same loss, it will be urged, will take place. As a matter of fact this need not be so, because the log fuel that is frequently used may be so built up that a maximum yield of radiant heat is effected and a comparatively small proportion escapes up the flue. Moreover, with gas there is no loss of heat through incomplete combustion, and consequently no production of smoke. In the experiment recorded in the table 2½ pounds of coal were consumed in an hour, and the effect on the air of the room was the raising of the temperature equal to 5°—a very satisfactory result, considering the cost of the fuel, which, at the rate of 25 shillings per ton, would be only 3 pence. Now a glance at the heating effect of a few of the gas fires will show that the same result was produced for 1 shilling 4 pence (equals 40 cubic feet of gas), which is approximately five times the amount for coal, or, oddly enough, in exact ratio of the thermal value as compared with gas. But the stoves mentioned do not give a maximum heating result, for reasons already put forward, the bulk giving twice the degree of temperature (from 10° to 12°) for the same outlay 1 shilling 4 pence. On this basis, therefore, we may regard the practical heating value of gas, calculated on the prices quoted, as equal to two-fifths that of coal. It is interesting to notice that in dealing with the products of combustion of the coal fire carbon monoxide does not occur in the fuel but in the gases in the chimney. That is the exact reverse of the case where gas as fuel is concerned. Probably, therefore, the carbonic acid found in the fuel gases is reduced as it comes into contact with the upper layers of red-hot fuel, forming carbon monoxide in accordance with the equation $CO_2 + C = 2\ CO$. In addition to carbon monoxide in the gases proceeding up the chimney there were also tarry matters and a considerable proportion of hydrogen.

(To be continued.)



Monarch Gasoline Range.

The Monarch Gasoline Range.

The Baxter Stove Company of Mansfield, Ohio, successors to the Adams & Westlake Company, have just brought out for the season of 1894 a gasoline range known as the Monarch. It is shown in general view in the accompanying illustration. The range is made in two sizes: one with two burners on top and one under oven, and one with two burners on top, one under the step and one under the oven. The oven and step burners are extra large and of great strength. The range is claimed to be constructed with a compactness that makes it ideal for family use. The ornamentation is elaborate in rich design and embellished with nickel, which, together with a highly japanned background, produces a neat effect. The body of the range is constructed entirely of cast iron, producing greater rigidity and substantiality than where sheet iron is used. Under all the burners are removable pans, for the purpose of catching any drippings from the cooking utensils.

The manufacturers also lay great stress upon the two features embodied in this construction, Baxter's patent sight feed and Baxter's patent evaporizing chambers. By means of the former the operator is enabled to see plainly the dropping of the fluid upon the evaporating cones and to regulate the flame exactly as desired, and by means of the latter the evaporating cones are completely surrounded with hot air conducted from the burners, greatly accelerating and assisting evaporation, and also giving the stove a more substantial construction. The manufacturers lay claim to possessing in the Monarch originality and perfectly satisfactory operation. The Danville Stove Works will look after the interests of the Monarch line in the East, and the same will be exhibited in New York at their place of business, 284-286 Pearl street.

New York and Cincinnati are now in telephonic communication.

STOVE TRADE NOTES.

A. Weiskittel & Son,

of Baltimore, Md., favor us with a copy of an attractive descriptive catalogue and price-list of Baltimore fire place heaters, Golden Rule and Petapsco ranges, and the varied line of Fire King gas stoves and heaters which the firm manufacture. The 150 pages of letter press of which the volume is composed carry well executed engravings of the leading lines mentioned, together with numerous testimonials showing the favor which the goods have received at the hands of the trade. An interesting feature of the work is found among the opening pages in the nature of directions for setting the fire place heaters manufactured by the firm. These heaters are illustrated and their principal features described. The greater portion of the volume is taken up with cast iron stoves and ranges, made both portable form and for brick work, following which are the company's gas burning appliances, offered under the name of Fire King. The assortment is a varied as well as an interesting one, and there is shown about everything that a dealer is likely to require in the way of goods in this class. A price list of stove hollow ware, a telegraphic code with carefully prepared index, together with a general index, are features of the work. The corners of the pages are rounded, the edges finished in a yellowish tint, and the binding is in paper covers, with embossed side title in white enameled letters upon a black ground.

The Ohio Stove Company

of Portsmouth, Ohio, send us a copy of a neatly arranged catalogue and price list of stoves, ranges, grates, hollow ware, &c. The early portion of the work is occupied with illustrations of the Buckeye range, a stove which the company introduced to the trade this year. Its constructive features cover oval shaped fire box, extra large flues, swing hearth, extra heavy sectional cast fire back, anti-clinker grate, cut top, patent oven door opener, and full size square oven. The ornamentation is of a pleasing character, and the stove has proven popular with the trade. The company's leading cook stove is also known as the Buckeye, and is decorated in a style similar to that used in connection with the range just mentioned. The Eclipse cook, Our Home, Valley Gem, Home Pride, Scioto, Dixey and National are some of the other goods illustrated and described. The leading parlor stove is the Sweet Home, arranged for burning hard coal and embodying the modern features of construction. This is followed by the Iolanthe parlor heater and the Columbian, made for burning hard or soft coal or coke. The latter is a neat heater, brought out this season from patterns made by the same concern who designed the company's Buckeye range. The ornamentation is of a pleasing character and the stove is rich in finish and design. Other goods to which attention is invited include the Oak Home, the Round Franklin, Ruby Home Model, Comet, Bloom, Vernon, Fire King, Boaz, Home Box, Amazon and Diana. A long list of hollow ware and stove repairs, kept constantly on hand, are other features of the catalogue.

ODD PLATES.

THE CATALOGUE of the Central Electric Heating Company, 26 Cortlandt street, New York, bound in a red cover, has 40 pages devoted to portable heating stoves and radiators, tailors', laundry and hatters' irons, soldering coppers, dentists' muffles and jewelers' crucibles. The last half of the catalogue shows an electric kitchen, and is devoted to ovens, boilers, hot plates, tea kettles, boilers, steam cookers and tea and coffee pots.

THE ACORN CALENDAR for the year 1894 has been issued by Rathbone, Sard & Co. of Albany, N. Y., and is of the popular shape followed by the company for several years. The front and the reverse are acorn shaped, and are decorated handsomely in a bluish gold, combined with the acorn lettering in carmine. The interior sheets containing the months are of many pleasing colors. The attractive and useful little article will be distributed among the trade.

RECENTLY a test of the heating and ventilating apparatus in the new school building, No. 20, at Utica, N. Y., was made under the supervision of George W. Griffith, superintendent of schools. The outside temperature was about 20° above zero. An anemometer was used. The apparatus was put in by the Carton Furnace Company of that city. Following shows the result:

Rooms. No.	Cubic feet in rooms.	Air exhaust per minute. Cubic feet.	Time to change air in each room. Minutes.
1.....	10,075	933	11
2	10,400	852	12
3.....	9,425	1,250	7½
4 .	9,435	1,022	9 1/6
5.....	9,672	675	14⅓
6.....	9,984	750	13⅓
7.....	9,048	1,008	9
9.....	9,048	825	11

The first four rooms are on the first floor; the second four on the second floor.

IN A LATE ISSUE of the Bucyrus *Telegraph* is an interesting article concerning some box stoves which are said to have been in use for over 40 years. According to the account, one of the principal manufacturing concerns in Bucyrus at the period named was the foundry of Wingert Brothers, which occupied the lot at the corner of Charles and Poplar streets. Among the more important products of this foundry was a box stove of moderate size, and adapted for burning wood. The stove was plain and heavy, the pattern being furnished, it is said, by a Dr. Augustine. It was about the time when stoves began to be substituted for the old-fashioned fire place, and a large number were put in use in that section of Ohio in which Bucyrus is located. To day, the *Telegraph* states, at least seven of these stoves are still in use, where they have done constant duty in public and private rooms for over 40 years, and, so far as appearances go, are practically as good as new. The only repairs which have been made have consisted of an occasional set of new rods or bolts. The article states that there may be, and probably are, others of these stoves still in use.

AMONG THE CALENDARS for the new year which have come to hand is that issued by the Standard Lighting Company of Cleveland, Ohio. It consists of a piece of heavy white cardboard measuring 11 x 14 inches, carrying upon the upper half a steel engraving representing a scene on the Western frontier. A conspicuous feature of the foreground is a herd of cattle in motion, while in the distance is seen the smoke from an approaching train of cars. Across the top of the card is the inscription in black letters: "Bull beef always tender cooked on the wonderful new process vapor stove." The 12 leaves forming the calendar proper are fastened below the picture described. In addition to the days of the week and month are given the phases of the moon. There is also presented in this connection a yearly calendar, printed upon tinted paper.

M. A. MURRAY, the Cold Springs, N. Y., agent of Rathbone, Sard & Co., recently shipped a Live Acorn stove to Pierre Conjard, Moras, Drome, France. The purchaser has lived in this country 10 or 11 years and a few weeks ago started for his native place. He had, however, remained in the United States long enough to appreciate the usefulness of an American stove, and consequently took one home with him. American made stoves are becoming more and more known in European countries and the sales are larger every year.

THE SOMERSET STOVE FOUNDRY COMPANY, Somerset, Mass., are now running three days in the week.

THE EXCELSIOR MFG. COMPANY, St. Louis, Mo., advise us of an inquiry from Amsterdam, North Holland, asking for catalogue and discounts on their line of Charter Oak and other stoves. The party making the inquiry states that he is familiar with the reputation of the product of the Excelsior Mfg. Company, and wishes to make arrangements to handle their goods.

W. H. SCOTT, who has for several years been connected with the Sill Stove Works, has been appointed manager of the Chicago branch at 52 and 54 West Van Buren street. W. H. Peckham, the late manager, has retired from the stove business and will engage in another branch of trade.

J. R. BARSE of Minneapolis, salesman in Minnesota for Rathbone, Sard & Co., celebrates his china wedding on Christmas Day. His fellow employees in the Chicago office of the company, with high appreciation of Mr. Barse's many good qualities, combined and purchased a costly and very artistic china pitcher to commemorate the event. The gift reflects much credit on the taste and generosity of the donors, and is worthy of preservation as an heirloom in the Barse family.

J. M. WARREN & Co. of Troy, N. Y., have issued a postal card notice relative to the fire that occurred in their warehouse on Thursday, December 14. They state they will necessarily be inconvenienced a few days by the conflagration, but as their principal building on River street escaped damage they hope to be able to fill orders within a very short time.

"COOKING MADE EASY" is the title of an eight page folder which reaches us from the Standard Lighting Company of Cleveland, Ohio. How this is accomplished is intimated in the reference to the New Process vapor stove, which is illustrated in several styles adapted to meet varying requirements.

THE BAXTER STOVE COMPANY of Mansfield, Ohio, have just completed arrangements with the Danville Stove & Mfg. Company of Danville, Pa., and 284–286 Pearl street, New York, whereby the latter concern will look after the interests of the Monarch line of goods in New York State, Pennsylvania, New Jersey and the New England States. We understand that a full line of Monarch stoves will be carried in stock by the Danville Company at their different warerooms, so that shipments can be promptly made.

H H. WATERMAN, a well known and popular salesman with the trade, who represents the Central Oil Gas Stove Company, 406 Pearl street, New York, will spend his holidays among his friends in Pennsylvania.

THE CONSUMPTION of Sam and Game oil and coal stoves is said by Sam S. Utter, 113 Beekman street, New York, to have been up to the average this year because they suit the people.

NORTH DIGHTON CO-OPERATIVE STOVE COMPANY, North Dighton, Mass., are sending out a neat calendar attached to a handsome embossed lithograph on which the faces of two pretty children are most prominent. The advertising matter refers to their Oak Grand, Live Oak and Prize Oak ranges.

A HANDY LITTLE POCKET DIARY comes to us from the Buckwalter Stove Company of Royersford, Pa. It is of convenient shape for the vest pocket, and each day of the year is apportioned ample space for the entering of business engagements and reminders. There are several blank pages for addresses and entries of a permanent character, as well as other pages with rulings for cash entries. Postage rates, a list of the largest cities in the United States, a list of the States with their populations, and a list of the largest cities in the world is the only printed matter contained in the diary, unless we except four inside fly leaves, which are devoted to remarks concerning the company's stoves, ranges and furnaces, in which appears a poetical quotation conveying to the chilly public a strong hint to get an Eclipse Duplex furnace:

"Get some warmth in this present life,
Not all in that to come."

JOSEPH H. BRODEUR, for eight years past employed as a wood pattern maker by the Co-operative Foundry Company of Rochester, N. Y., died on Sunday morning, December 17. He was born in Albany, March 17, 1844, served with distinction during the War of the Rebellion, and was mustered out of service with his regiment June 30, 1863. Three years later he became a member of the Tenth Regiment, N. G., S. N. Y., remaining until March 5, 1881, when he resigned his commission and removed to Rochester. He leaves a widow and five children. He was buried with military honors from his late residence, 94 South Clinton street, on the afternoon of Tuesday, December 19.

A. WEISKITTEL & SON of Baltimore, Md., are distributing among their friends in the trade a neat card wishing the recipients "A Merry Christmas and a Prosperous New Year." The sentiment is expressed in script letters, and in the upper left hand corner of the card is a *fac-simile* of the trade-mark of the firm, briefly setting forth the reputation of Fire King gas stoves and ranges.

THE QUICK MEAL STOVE COMPANY of St. Louis, Mo., are distributing an interesting little pamphlet of pocket size relating to Quick Meal gas and gasoline stoves. The 24 pages contain a great deal that the dealer handling goods of this kind can read to advantage, while numerous testimonial letters show the estimation in which the Quick Meal goods are held by those who have used them. The last page of the pamphlet is devoted to some interesting facts about the Quick Meal stove, which, it is said, was born in 1882. In that year 876 stoves were made on the third floor of a building 20 x 40 feet in size. Now, the home of the Quick Meal stove consists of three and four story buildings, having a frontage of 160 feet and a depth of over 300 feet. The works are equipped with machinery especially adapted to the production of Quick Meal stoves, and over 500 men are given employment. In the year 1893, it is stated, there were 71,316 Quick Meal stoves made and sold, each burner being carefully tested before being placed in position, and the stove carefully inspected before going to the warehouse.

THE MATTHEWS-NORTHRUP COMPANY, art printers, of Buffalo, N. Y., have brought out their Daily Reminder for 1894. This is a diary for the vest pocket, put up in such convenient form and so well adapted to the requirements of business men generally that those who have once used them are anxious to keep up the habit in succeeding years. Stove manufacturers will find them greatly appreciated by their customers. The Matthews-Northrup Company offer them in eight different styles of finish at extremely reasonable prices, with special stamping on the covers for advertising purposes. As the company truly say, they are good enough for a millionaire to carry and cheap enough to scatter broadcast.

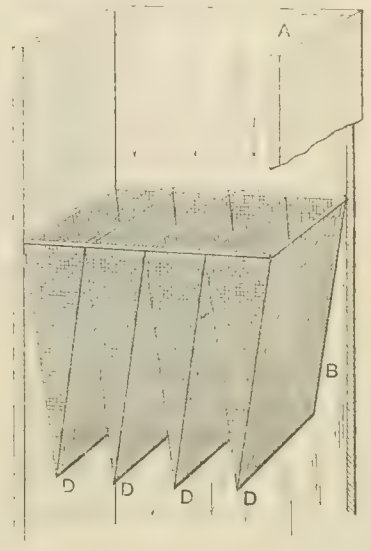
THE MICHIGAN STOVE COMPANY have prepared for advertising purposes copies of their trade-mark printed on paper in bright colors. The paper is cut to the exact outline of the trade-mark and is gummed on the back. Several sizes are furnished to dealers in Garland stoves and ranges in the expectation that they will be posted in conspicuous places. They are so brilliant in appearance that they cannot fail to attract attention.

Detroit, Pittsburgh, Buffalo, Philadelphia and other large labor centers are rising nobly to the situation in making provision for the relief of their unemployed poor by means of public works and organized private charity.

One of the few remaining refuges is about to be closed to forgers and embezzlers. Argentina, it is announced, has entered into an extradition treaty with Great Britain, which covers these offenses.

Dodge's Air Purifier.

The illustration herewith shows an air purifier for which patents have recently been granted to John S. Dodge, who is manufacturing it at 720 East Sixteenth street, Minneapolis, Minn. Mr. Dodge, who is connected with large flour mills of that city, says that his device originated from experience in handling flour dust in the mills, and that his experiments date back to the



Dodge's Air Purifier.—Fig. 1.—Broken View.

mill disaster of 1878. The purifier, however, is designed to be used in connection with any system of heating, steam, hot water furnaces or hot blast. The object of the invention is to arrest the dust and other floating particles in the air and provide means for automatically regulating the strength of air currents used in heating and ventilation. The purifier consists of a series of V-shaped cloth pockets arranged in

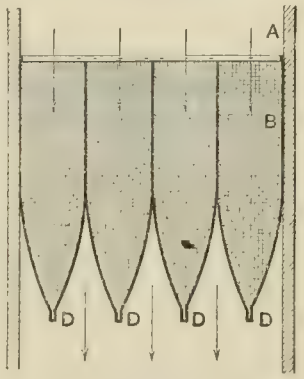


Fig. 2.—Pockets Distended, Reducing Air Supply.

an air duct and completely filling it, so that the air must pass through the cloth. Fig. 1 shows a broken perspective view of the purifier ready for use, the large end of the pockets being presented to the entering air and the small end being weighted to make them hang evenly. Fig. 2 shows the pockets distended under an excess of air pressure. The device is said to reduce and purify the air supply as required, regardless of the force or condition of the air that enters. The weights bring the pockets back to their natural shape when the pressure is modified. The filter cloth is of special weave, with a long nap, which keeps the mesh of the cloth free and collects all the dust and impurities on the outer surface. Provision is made for the removal and renewal of the cloth.

TRADE REPORT.

The Iron Market.

Deeper gloom is settling down on the Iron trade, and there are few crumbs of comfort for those engaged in this great industry. Pittsburgh and its adjacent districts are enjoying the melancholy distinction of crowding competing sections to the wall and threaten, with a further lowering of wages at some of the mills, to drag the level of prices even lower. In Eastern Pennsylvania the Iron manufacturers have been appealing quite successfully to their local financial institutions to withdraw accommodations from the Western rivals, and consumers throughout the Eastern territory are being plied with arguments to show them the danger of delivering themselves into the hands of distant producers.

In Pig Iron the general markets are very dull so far as Foundry grades are concerned. The attitude of the Southern producers will not be thoroughly tested until some of the larger Cast Iron Pipe contracts come into the market which are now under negotiation. Among them it may be interesting to mention is one for 8000 tons for Mexico. From Philadelphia comes the significant news that capitalists close to the iron trade have bought considerable quantities of Pig Iron for investment. It is not believed that the holdings of the Crane Company, which are to be sold, are large enough to create a lasting impression.

Steel Billets are squarely down to $16.50 at Pittsburgh, and are correspondingly weak in the East. Wire Rods, for which the off season has come, are offered at $24 at Western mills. In connection with the Wire trade it may be mentioned that the 25,000 keg order for Wire Nails for the Standard Oil Company was captured by a local mill. Every important concern in the country fought for the contract. The demoralization in prices for all rolling mill products continues.

Pig Iron.—Transactions in Pig Iron in the New York market are very light. The failure of the Crane Iron Company restricts the quantity of standard Lehigh Iron available for the markets, although it is understood that the furnaces may be started to work up raw material on hand. Some of the pledged stock of Iron may be sold peremptorily to satisfy advances. We quote: Northern brands, $14 @ $15 for No. 1; $13 @ $14.25 for No. 2, at tidewater. Southern Iron, same delivery, $13 @ $14 for No. 1; $12 @ $13 for No. 2; $11.50 @ $12.25 for No. 3; $11.75 @ $12.25 for No. 2 Soft, and $12.25 @ $12.50 for No. 1 Soft.

Philadelphia advices intimate intense dullness in Pig Iron. Consumers have no desire to load up under present conditions, neither are producers inclined to enter many orders at such prices as the market would at this time afford. It is believed that things will drift along for some time without any material change in prices, although considering the increase in production and the almost total suspension of consumption during the next two or three weeks, prices may go a little lower before there is anything like liberal buying. It is significant, however, that some heavy speculative purchases are being made by capitalists who are closely identified with the trade. Money has been quietly invested wherever it was most needed and whenever prices were made attractive. Doubtless the figures were very low, but the Iron was bought as a speculation, and would not have been bought unless special inducements were offered. These, with purchases made some two or three weeks ago by legitimate consumers, have relieved the market temporarily, so that while there is more Iron being made, pressure to sell is as yet no greater than it has been all along. General quotations for Philadelphia deliveries are about as follows:

No. 1 Foundry	$13.75 @ $14.25
No. 2 Foundry	13.00 @ 13.25

In Chicago, trade in all kinds of Coke Iron is quiet, but there are indications that after the new year opens a number of concerns will be in the market for a considerable quantity of Iron. Consumers are now exceedingly careful not to take any more stock than is absolutely necessary to meet their requirements. Orders for single carloads in almost every case name definite quantities, which are not to be exceeded. Quotations at present are purely nominal and indicate the prices asked for small lots only, and they can be shaded materially on round lots. Offers are being made of Iron from second hands or from the stock of bankrupt foundries at very low rates. Transactions in Lake Superior Charcoal have been a little more frequent. Several lots were sold the past week to malleable companies for immediate shipment at a slight concession for spot cash. Quotations are now as follows for cash:

Lake Superior Charcoal	$15.50 @ $16.00
Local Coke Foundry, No. 1	13.50 @ 14.00
Local Coke Foundry, No. 2	12.75 @ 13.00
Local Coke Foundry, No. 3	12.25 @ 12.75
Local Scotch	14.00 @ 14.50
Ohio Strong Softeners No. 1	15.50 @ 16.00
Southern Silvery, No. 1	@ 13.75
Southern Silvery, No. 2	@ 13.25
Southern Coke, No. 2	12.15 @ 12.40
Southern Coke, No. 3	11.65 @ 11.90
Southern, No. 1, Soft	12.40 @ 12.65
Southern, No. 2, Soft	11.65 @ 11.90
Tennessee Charcoal, No. 1	16.00 @ 16.50
Alabama Car Wheel	18.25 @ 18.50
Jackson County Silvery	16.00 @ 16.50
Other Ohio Silvery	15.00 @ 15.50

The week has been uneventful in the Pittsburgh Pig Iron market. Pittsburgh is now making nearly as much Iron as ever before in her history, and this fact, more than anything else could do, proves the superiority of that district over all other places for the cheap production of Pig Iron. Quotations are as follows:

No. 1 Foundry	$11.75 @ $12.00 cash.
No. 2 Foundry	11.25 @ 11.50 "

Business in Pig Iron during the week in the Southern markets has been in the main confined to filling small orders from the jobbing foundries, which only in a few instances reached as high as 500 tons. There was no large demand either for spot or forward delivery, but there were moderate sales of No. 2 Foundry Coke Iron at $7.90 @ $8 ℔ ton, f.o.b. Birmingham, which is a decline of 25¢ @ 35¢ ℔ ton from the prices obtained two or three weeks ago. There were moderate orders from the East for various kinds of Iron, yet none of them were large, and the aggregate sales of all kinds were not important, although larger than in any week in the recent dull times. Quotations are as follows:

Southern Coke, No. 1	$12.25 @ $12.50
Southern Coke, No. 2	10.75 @ 11.00
Southern Coke, No. 3	10.50 @ 10.75
Ohio Soft Stone Coal, No. 1	15.50 @ 16.00
Ohio Soft Stone Coal, No. 2	14.50 @ 14.75
Lake Superior Coke, No. 1	15.00 @ 15.25
Lake Superior Coke, No. 2	14.00 @ 14.25
Hanging Rock Charcoal, No. 1	18.50 @ 19.00
Hanging Rock Charcoal, No. 2	17.50 @ 18.00
Tennessee Charcoal, No. 1	14.00 @ 14.25
Tennessee Charcoal, No. 2	13.00 @ 13.25
Standard Southern Car Wheel	17.75 @ 18.00
Lake Superior Car Wheel and Malleable	17.00 @ 17.25

Metal Market.

Pig Tin.—The movement in prices has been very narrow, and the line of value is practically the same at this writing as it was a week ago. Speculation remains dormant, pending developments in the tariff matter or other incentive. Dealers have purchased cautiously, and consumers have bought even more sparingly than usual at this season of the year. The bulk of business was at prices on the basis of 20.50¢ net cash for Straits, in 10-ton lots, near future delivery. Consumption shows the usual falling off for this season, and the jobbing trade is, accordingly, extremely dull. Prices for small lots remain at the same figures as have ruled for the past three or four weeks.

Semi-official data show that 1450 tons of Pig Tin were shipped from the Straits to Great Britain and America during the first half of December, besides 375 tons to Continental Europe, against a total of 655 tons during the corresponding period last year. Since July 1 about 770 tons have arrived here, the greater portion of which is in bond, and there are now about 650 tons afloat for this point.

Copper.—Business has been quiet throughout the week. Prices have undergone no radical change, but quotations made in various sources are considerably apart and leave a ripple on the surface that seems to have a rather annoying effect in more quarters than one. Copper was supposed to be well under control and sellers who represent the producers profess to maintain something like uniform prices. In some quarters it is denied that there is any understanding or agreement and that prices have not been cut below a level that is supposed to represent sellers' ideas of value. There is what may be termed strong circumstantial evidence that, whatever the surface appearances may be, the market is slightly free from restraint and not particularly strong as viewed from the statistical position. Producers of most brands of Lake Superior Ingots quote 10½¢ and claim to be sold ahead. Lots from second hands could have been secured at ⅛¢ less, however, and on the Metal Exchange there were offers to sell at 10.30¢ @ 10.35¢ for January delivery. The demand from consumers is on a very moderate scale for both Ingot and Sheet Copper. Prices for small quantities are firm at former quotations.

Pig Lead.—Dealings have been on a very moderate scale and there is no sign of livelier demand, except perhaps in a speculative circle, where it not frequently happens that "demand" is nicely timed for effect upon prices. In other words, the best bidding has been from sources in which manipulation is common. Consumers have been influenced very little up to the present time. In any event they have purchased moderately and seem to have given little more than passing attention to the speculative manouvering. The sales effected were chiefly at 3.20¢ @ 3.22½¢ for carload and larger lots, near future delivery. Bullion price has been down to 3.10¢ during the week and moved up to 3.20¢ subsequently, while 3.27½¢ for January and 3.30¢ for February were bid on the Exchange. For ton lots and less, 4¢ @ 4½¢ is asked, but concessions on these prices are not uncommon.

Lead Pipe and Sheets.—Business is stagnant in these products, owing in a measure to the restricted demand—which always marks the stock-taking period, but largely to the absence of life in the building trade. No material revival of trade is looked for, even under the most favorable circumstances, until the spring trade begins. Prices are soft, although nominally unchanged.

Spelter.—Western brands are very irregular in price at the present time. Some may be had at 3.70¢, while 3.80¢ is generally quoted for what is classed as prime and 3.90¢ reported paid for choice. The demand is slow and hesitant. The offering is uneven. Upon the whole the market shows rather poor form, and a turn for the better is dependent in a good measure upon the policy of producers in the matter of restricting their output. Jobbers' asking prices for ordinary Western in small lots are 4½¢ @ 4¾¢.

Tin Plate.—The market for Tin Plate is of the dullest, even when due allowance is given for the season of the year. Early in the week some fair contracts were reported for ordinary Coke Plates for spring and summer delivery. These transactions were, however, limited in number and confined to but a few dealers. The general run of jobbers report that business has been slow in both prompt and future deliveries, and no brisker movement is looked for until after the holidays. Such orders as are received are merely for the smallest possible quantities that will satisfy absolute needs. The outlook is not generally regarded as promising, particularly if the anticipated reduction of tariff is postponed until October 1, according to the latest proposal of the Ways and Means Committee. Even some of the domestic Tin Plate manufacturers, who would presumably benefit by the delay, express themselves as being in favor of an earlier date. Prices show little change, but the buyer of spot stock would not find it a hard task to obtain concessions on quoted rates for cash or other desirable inducements.

A London cable, of December 20, to *The Iron Age* reports that Tin Plate has been in somewhat more active demand on the other side, but except for moderate quantities of Bessemer Cokes few orders have been placed. Sales have been chiefly from stock on hand, and for early delivery. Prices continue low. Liverpool quotations were as follows:

IC Charcoal, Alloway grade	12/3 @ 12/9
IC Bessemer Steel, Coke finish.	11/3 @ 11/6
IC Siemens " " "	11/6 @ 11/9
IC Coke, B. V. grade, 14 x 20	11/3 @ 11/6
Charcoal Terne, Dean grade	10/9 @ 11/

Sheet Iron.—Very little business is doing in Black Sheets, but some inquiries are reported for delivery during the early months of the coming year. An improved tone is noted in mill business in Galvanized Iron. Prices, however, were unchanged, at 70 % @ 70 and 2½ % for small lots from store.

ONE OF THE EVENTS of the season will be a grand assembly of Christmas turkeys and Royal Roasters. Silver & Co., 18 Warren street, New York, report a mass of invitations for their Royal Roasters, and say that in no case have regrets been sent.

Chicago Report.

Scrap.—The inquiry is light now, as consumers will not buy until after the expiration of the year. Dealers furnish the following list of buying prices, Chicago delivery:

	Per net ton	Per lb
No. 1 Wrought Scrap	$7.00	....
Machinery Cast	7.00	....
Malleable Cast	6.00	....
Stove Plate (free of burnt)	5.00	....
Burnt Iron and Grate Bars	3.50	....
Sheet Iron and Hoops	2.00	....
Plow Steel and Breaking Stock	5.50	....
No. 2, such as Shovels, Hoes, &c	4.00	....
Old Boilers—whole (Iron)	4.00	....
" (Iron)—cut in single Sheets and Rings	6.00	....
Old Gas-Pipe and Boiler Tubes	5.00	....
Cast Borings	3.25	....
Turnings	4.00	....
Horseshoes	7.00	....
Copper Bottoms	....	5 ¢
Copper Clips and Heavy	....	7 ¢
Heavy Brass	....	5½¢
Light Brass	....	3½¢
Pipe Lead	....	2½¢
Tea Lead	....	2 ¢
Zinc	....	2 ¢
Rubber	....	4 ¢

Anthracite.—The great coal companies have evidently overestimated the demands of this locality. The heavy trade in November and trouble in getting shipments through by rail caused them to hasten shipments by boat from Buffalo before navigation closed on the lakes. Now, a local paper says: Although the receipts of anthracite at Chicago were nearly 80,000 tons less this year than last, the docks are filled to overflowing and many steamers are held in the river because there is no place to put their cargoes. It may be a month before there will be a chance for some of the boats to unload. Instead of lying in the coal cellars of private residences and business houses, as has been the case to a large extent in former years, this city's supply of fuel is still unbought and is on the docks. People generally cannot afford to buy their season's supply ahead, but purchase a few tons at a time and economize in the consumption as much as possible. Prices are weak, but rates have not been openly cut. Carload lots of 12 net tons or over are quoted as follows:

	Grate.	Egg, Sto. and Ch.
Chicago, Ill	$5.85	$6.10
Milwaukee, Wis	5.85	6.10
Kansas City, Mo	9.05	9.30
Council Bluffs, Iowa	9.05	9.30
Lincoln, Neb	9.20	9.45
Sioux City, Iowa	9.05	9.30
Aberdeen, S. Dak	9.10	9.35
Dubuque, Iowa	7.15	7.40
Madison, Wis	7.35	7.60
St. Paul, Minn	8.35	8.60
Burlington, Iowa	7.35	7.60
Des Moines, Iowa	8.80	9.05
Davenport, Iowa	7.15	7.40
St. Joseph, Mo	9.05	9.30
Leavenworth, Kan	9.05	9.30
Omaha, Neb	9.05	9.30

Colorado Anthracite.

COLORADO FUEL & IRON COMPANY.

Denver	$8.00
Pueblo	8.00
Colorado Springs	8.00
Leadville	8.00
Cheyenne, Wyo	10.00
All points between Denver and Missouri River	8.85

CONDITION OF THE

Hardware Trade.

THE year draws to a close with the falling off in business which isexpected at this season. The approach of the holidays, the withdrawal of travelers from the road, the attention being given to plans for the new year's business, the effect of the financial disturbance and business depression of the past six months, the uncertainties of Tariff legislation, the weakness in the prices of some staple goods and the probability of lower prices in other lines—are influences which at this time are conspiring to make the trade defer all unnecessary purchases. The volume of business is therefore, to a good degree, limited to a few seasonable supplies and such goods as are needed for immediate sale. The improvement in the financial condition is a matter for congratulation, with the prospect of a better state of things in the near future than has characterized the last part of the present year.

Advices from Chicago.—The Shelf Hardware jobbers have enjoyed a comparatively fair trade the past week, but believe that business is now about over for this year. Salesmen are very generally on their way home to pass the holidays, and there will be few orders transmitted by mail direct from country buyers. Manufacturers' agents report a quiet condition of affairs in almost every line. A good demand has been experienced for Heavy Hardware. The trade in Iron and Steel is fair from small consumers, but there has been an unusually large movement in Sleigh stock, on which prices have risen owing to the scarcity of material. A stiff advance is asked on made-up Cutters.

Notes on Prices.

Wire Nails.—The market still continues to show a declining tendency and carload lots of Wire Nails at mill are much more readily obtainable at $1.10 than they were a week or two ago, and it is understood that sales have been made at $1.05. The regular demand for early delivery is very moderate, but the low prices which are ruling have had the effect of inducing the placing of some fair orders. The trade are, however, to a large extent deferring purchases until after the first of the year, but at the same time buyers are watching the market carefully, so as to be ready to place their orders when there are indications of a strengthening in price.

Advices from Chicago.—Matters are quiet in Wire Nails. There is more or less inquiry for spring delivery, but few Nails are wanted for December or early January. Factory lots are quoted at $1.25 to $1.30, Chicago, and small lots from stock are selling at $1.35 to $1.40.

Cut Nails.—With the unsatisfactory condition of the market the mills are to a considerable extent reducing their production and avoiding as far as possible undue accumulation of stocks. The price in the East is represented by the quotation of 90 cents for carload lots, f.o.b. mill, and is regarded by many as being as low a figure as is obtainable on regular specifications. There is, however, reason for believing that this price has been slightly shaded. Small lots from store in New York are quoted at $1.20 to $1.25.

Advices from Chicago.—Business in Cut Steel Nails is very quiet and will probably continue so until after the turn of the year. The reported fire at Lake Side did no damage to the works proper, but only affected the keg factory, which is operated by outside parties. The works are in active operation and will not shut down for the holidays. Prices are unchanged at $1.15 to $1.20, according to the character of the order, while small lots from stock are selling at $1.25.

Barb Wire.—Barb Wire as well as other leading staples feels the effect of low prices made by manufacturers who are especially desirous of realizing on their product, and as a result still lower prices have been developed. It is understood that some sales have been made by Western makers in large lots at $2 for Four-Point Galvanized at mill. The market is fairly represented by the quotations of leading manufacturers of $2.10 for Galvanized and $1.70 for Painted, with 5 cents off in carload lots. One or two of the manufacturers, however, refuse to meet current prices, and for the time being have practically withdrawn from the market. The legitimate demand is light, but some business is induced by the extremely low prices which are offering. Small lots from store in New York are quoted at $2.35 to $2.40 for Galvanized.

Advices from Chicago.—Manufacturers who deal largely with the retail trade report as much Barb Wire sold now as last year up to the same date. The tonnage being made up of small orders, a better price is realized than if the orders were as large as are usually placed by jobbers. Manufacturers who cultivate relations with jobbers report a very quiet trade. Prices continue to be quoted at $2.35 to $2.40, Chicago, for Galvanized Barb Wire in factory lots; $2 50 to $2.55 in small lots.

Plain Wire.—The market for Plain Wire is weak and irregular, and somewhat lower prices have been developed within the past two weeks. The condition of the market is reflected in the following quotations of a well known concern, which are subject to an abatement of 5 cents on carload lots:

	Annealed.	Galvanized.
Nos. 6 to 9	$1.35	$1.75
" 10 and 11	1.45	1.85
" 12 and 12½	1.55	1.95
" 13 and 14	1.70	2.10

Some of the manufacturers, however, refuse to meet these prices and are naming slightly higher figures.

Lanterns.—Buhl Stamping Company, Detroit, Mich., quote these goods at the following net prices:

Mascot assortment, three square lift Lanterns, assorted colors, two dash Lanterns and one head light, per case	$5.00
Brilliant assortment, 12 square lift Lanterns, assorted colors, per case.	6.00
Dash Board Reflector Lanterns, japanned blue, per dozen	5.50
1894 Tubular head light, per dozen..	21.00

Venetian Ironwork Outfits.—The materials for Venetian Ironwork described in our last issue as put on the market by A. J. Weed & Co., 106-108 Liberty street, New York, are subject to a trade discount of 20 per cent. A manual relating to this work gives complete list prices on the goods.

Hammock Hooks.—Stearns' Hammock Hooks, manufactured by E. C. Stearns & Co., Syracuse, N. Y., No. 200 of which was illustrated in *The Metal Worker* December 16, 1893, are sold at net prices as follows:

No.		Per doz.
200.	Steel Plate Hammock Hook	$0.60
20.	Hammock Hook	.60
24.	Hammock Hook	.60

Hair Curlers.—The Unique Self Heating Hair Curler, is manufactured by the Unique Novelty Company, Detroit, Mich., and sold on 30 days time, or 3 per cent. discount for cash in ten days from the following net prices:

	Per dozen.
Nickel	$16
Silver	24
Gold	36

Steel Broiler.—The Steel Broiler illustrated in our issue of December 16, 1893, and manufactured by the Cleveland Stamping & Tool Company, Cleveland, Ohio, is sold at $1 each, from which a discount of 70 and 10 per cent. is allowed.

Adjustable Paint Burner.—The Quick Meal Adjustable Paint Burner, manufactured by Quick Meal Stove Company, St. Louis, Mo., and illustrated in our issue December 9, 1893, is sold at $5 each, less a discount of 30 per cent.

Glass.—The week has developed few or no changes in the condition of the Glass market, although some additional factories in the West were put in operation. It is reported that some of the factories making Glass have orders which will keep them employed for some time. Local trade is limited to small orders, which is not unusual at this season of the year. Prices are reported from Pittsburgh as being 85 and 5 and 5 per cent. discount for single and 85 and 10 and 5 per cent. discount for double strength Glass. Western prices from factory are given as 85 and 7½ per cent. discount for single and from 85 and 10 and 10 to 85 and 15 per cent. discount for double strength Glass. It is reported that the price at which Plate Glass is being sold allows of its use as a substitute for Window Glass of the larger sizes.

Cast Iron Soil Pipe.—At a meeting of Soil Pipe manufacturers, held in New York on the 5th inst., the follow-

ing changes in the list prices of Soil Pipe and Fittings were adopted: 4-inch Standard Soil Pipe, 40¢ ℔ foot; 4-inch Double Hub Standard Soil Pipe, 46¢; 4-inch Standard ¼ Bends, 75¢ each. The list prices on ⅛, ⅙, ⅓ and 1/16 Bends, Standard and Extra Heavy, from 2 inch to 15-inch inclusive, to read the same as ¼ Bends. The list prices on ⅛, ⅓ and 1/16 Double Hub Standard and Extra Heavy Bends to be the same as on Double Hub ¼ Bends, 2 inch to 15-inch inclusive. The list price on Tees, Standard and Extra Heavy, to be the same as the list price on Standard and Extra Heavy Y's, 2-inch to 15-inch inclusive. The list price on Standard and Extra Heavy Cross Heads to be the same as on Standard and Extra Heavy Double Y's, 2 inch to 15-inch inclusive. The list price on long Tees to be the same as on Standard Extra Heavy long Y's, 2 inch to 15-inch inclusive. All fittings, Standard or Extra Heavy, with outlet or hub vent, add to the list price as follows: 2-inch, 50¢; 3 inch, 60¢; 4-inch, 75¢.

Old Metals.—The market for Old Metals is dull and lifeless. Some recent forced sales of Scrap Iron have resulted in very low prices on this material, particularly for the Wrought Scrap. The demand continues very slow and prices weak, quotations for New York delivery being about as follows:

Heavy Copper	℔	lb	7¢
Light and Tinned Copper	℔	lb	6½¢
Heavy Brass	℔	lb	5¢
Light Brass	℔	lb	4½¢
Lead	℔	lb	3¢
Tea Lead	℔	lb	2¾¢
Zinc	℔	lb	2½¢
No. 1 Pewter	℔	lb	14¢
No. 2 Pewter	℔	lb	6¢
Wrought Scrap Iron, ℔ gross ton	$7.00	@	$8.00
Heavy Cast Scrap, ℔ gross ton	8.00	@	9.00
Stove Plate Scrap, ℔ gross ton	4.00	@	5.00
Burnt Iron, ℔ gross ton	2.50	@	3.00

Old Rags, Paper, &c.—Business in these materials continues slack and is likely to be so for the next two or three weeks. Prices are somewhat irregular, the following being about the present rates paid for Old Rags, Paper, &c., by New York dealers:

No. 1 White Rags	℔	lb	3¼	@	3⅓¢
No. 2 White Rags	℔	lb	2¼	@	2½¢
Mixed Rags	℔	lb			2¼¢
Blues and 3ds	℔	lb	1	@	1¼¢
Hard Sized White Shavings	℔	lb	2¼	@	2½¢
No. 1 White Book Shavings	℔	lb	2	@	2⅛¢
No. 2 White Book Shavings	℔	lb	1	@	1⅛¢
Light Book Shavings	℔	lb			¾¢
No. 1 Mixed Shavings	℔	lb	¾	@	1 ¢
No. 2 Mixed Shavings	℔	lb	½	@	¾¢
No. 1 Printed Books	℔	lb	1	@	1¼¢
Ordinary Mixed Books	℔	lb	½	@	¾¢
Newspapers	℔	lb	½	@	3-5¢
No. 1 Manila Paper	℔	lb	1	@	1¼¢
No. 2 Manila Paper	℔	lb	⅝	@	¾¢
Bogus Paper	℔	lb			½¢
Common Paper	℔	lb	⅜	@	½¢
Straw Chips	℔	lb	½	@	⅝¢
Binders' Clippings	℔	lb	½	@	⅝¢
Jute Butts	℔	lb	1½	@	2 ¢
No. 1 Jute Bagging	℔	lb	1	@	1¼¢
Mixed Bagging	℔	lb	¾	@	1 ¢
No. 2 Bagging	℔	lb	½	@	¾¢
Hemp Twine	℔	lb			2½¢
Manila Rope	℔	lb			2½¢
Jute Rope	℔	lb	1½	@	1¾¢
Mixed Rope	℔	lb	¾	@	⅞¢

Old Rubber.—The market for Old Rubber is unchanged in its dullness. Quotations are approximately as follows:

Car Springs, ton lots, ℔ lb.		@	$0.03¼
Rubber Shoes, carloads, delivered at factory, ℔ lb.		@	.03
Rubber shoes, less than carloads, ℔ lb.	0.02¼	@	.03⅛
Large Hose, ℔ ton		@	9.00
White Wringer Rolls, ℔ lb.		@	.04¼
White Syringes, ℔ lb.		@	.05

Trade Notes.

THE DIXON CRUCIBLE COMPANY, Jersey City, N. J., show a most sympathetic appreciation of the editorial needs. In view of their kindness, it is our pleasant duty to acknowledge having received from them a box of assorted pencils. They are hard and soft, with and without rubbers, adapted to every mood of the writer. Nor was there omitted that most important of all things, the blue pencil, of which there are a half dozen samples included in the selection.

THE PITTSBURGH REDUCTION COMPANY, Pittsburgh, Pa., are putting up a plant at Niagara Falls for the manufacture of aluminum, using the electrical power generated by the Niagara Falls Power Company. The plant will probably be in operation by the middle of next year.

THE TARBOX MFG. COMPANY, New London, Conn., distribute an illustrated price-list relating to the Tarbox Stove Gloss of their manufacture. The special advantages of this Stove Gloss, which is put up in pails, cans and bottles, are alluded to.

WE ARE INDEBTED to the New Bedford Copper Company, New Bedford, Mass., for a little pamphlet giving interesting information and statistics about the old Massachusetts town of New Bedford, which is a handbook of the place, giving its history, a map, statistics of its manufactures and trades and other local information.

THE GURNEY REFRIGERATOR COMPANY, Fond du Lac, Wis., have just completed an important addition to their plant in the shape of a two-story brick building, 36 x 115 feet, in which they have installed considerable new machinery. The company have also made some improvements recently in the style and finish of the cabinet work on their Refrigerators. Business has been very promising with them during the year, and orders of goods for the coming year indicate a promising trade in their specialties.

MATTHAI, INGRAM & Co., Baltimore, Md., have added materially to their manufacturing plant. The new features include a fire proof retinning building, and a four-story addition, 80 x 120 feet. The firm have also enlarged their Galvanizing and Black Iron departments.

THE FACTORY of Cordley & Hayes, manufacturers of Indurated Fiber Ware, Lockport, N. Y., which was destroyed by fire last July, has been rebuilt and is now in full operation, with an added producing capacity of from 50 to 100 per cent. The demand for the special line of goods made by the firm is reported to be increasing rapidly.

STRANSKY & Co., 27 Murray street, New York, say that notwithstanding the widespread depression in business, the demand for their Cameo Ware has increased so that they have been unable to fill orders as completely as usual. With a view, however, to filling their back orders, they have closed out the greater portion of the stock of another importer, and with increased manufacturing facilities in Europe they hope to meet future demands satisfactorily.

GEORGE W. JOHNSON'S SONS, wholesale Tinware manufacturers and dealers, Wheeling, W. Va., have enlarged their building from a three-story brick to a five-story brick, with stone front. Each floor is 130 x 25 feet, and the new facilities afforded and space gained enable the firm to extend their business materially.

A NUMBER OF SHEET MILLS in the plant of the Moorhead-McCleane Company, at Pittsburgh, which have been idle for some time, have again been put in operation.

THE PLANT of the W. Dewees Wood Company, at McKeesport, Pa., manufacturers of patent planished Sheet Iron, is in operation to nearly full capacity.

THE PLANT of Summers Brothers & Co., Struthers, Ohio, manufacturers of box annealed Sheet Iron and Sheet Steel, is in partial operation, the product being light steel sheets. Prospects for the continued operation of this plant for the winter months are reported as very bright. The continued excellent demand which this firm are receiving for their iron and steel sheets is due to the fact that they endeavor at all times to turn out a product of the very best quality.

THE CHICAGO STAMPING COMPANY, 227 to 231 South Green street, Chicago, announce the appointment of W. L. Goodrich to the entire charge of their city and country sales. Mr. Goodrich has been connected with the Metal and Tinware trade for the past 25 years, and has a very wide acquaintance throughout the Hardware interests of the Northwest.

JOHN H. BAIRD, who represented the Jos. Dixon Crucible Company of Jersey City, at the World's Fair, has published a charming little *brochure* giving his reminiscences of the exposition. Mr. Baird is of a poetic temperament, and has been deeply impressed by the greatness of the fair, so that the vigorous prose in which he has clothed his thoughts glows with enthusiasm. The many friends of Mr. Baird will value this work as a memento of his personality as well as a souvenir of the exposition itself.

THE RAZORINE MFG. COMPANY, 2 West Fourteenth street, New York, have prepared card stands upon which are fastened a dozen cakes of Razorine for advertising purposes. Above the packages is printed matter calling attention to the merits of the preparation and announcing that by its use the dullest razor can be sharpened. The company are prepared to offer liberal inducements to merchants to insure the more rapid introduction of this specialty.

MUDGE & BENJAMIN is the style of a firm which has recently entered the Hardware and House Furnishing Goods business at Olean, N. Y. They will give particular attention to retailing, but will also, they advise us, conduct a wholesale business. The new firm will be glad to receive catalogues, circulars, &c., from manufacturers and importers.

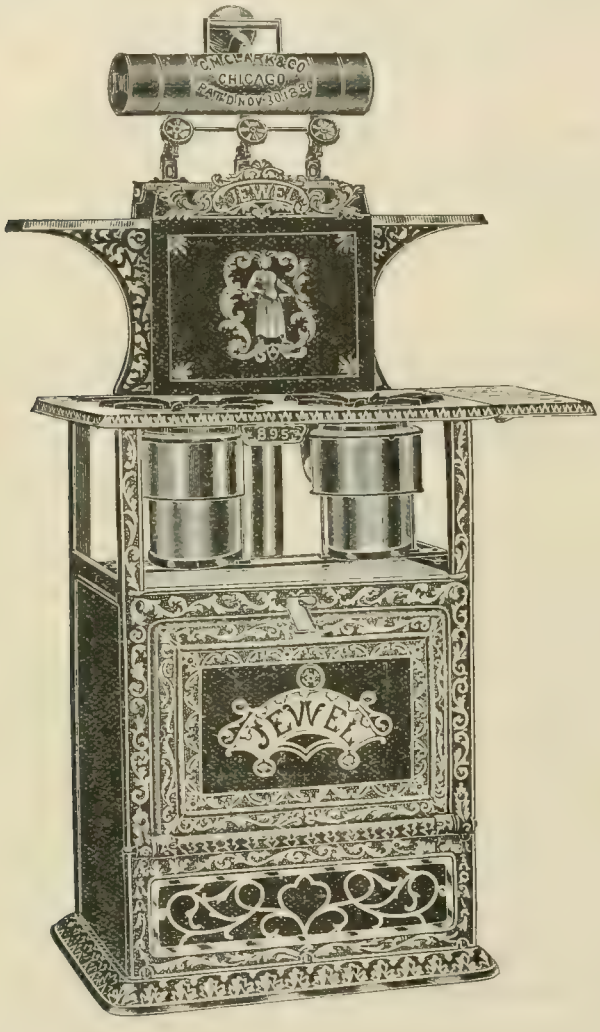
BRONSON SUPPLY COMPANY, 72 Beekman street, New York, have been offering special inducements, which hold good until December 31, to merchants on season goods suitable for holiday and regular trade. They selected five leading sellers from the production of their several companies and have made the price extremely low. Two are of their Seamless Steel Never Break

Ware, a brass Umbrella Holder of the Ideal specialties, one from the Puritan line of cooking utensils and a baking and roasting Pan of the Excelsior kind. They direct the attention of the trade to the plan and refer to it as producing satisfactory results.

LALANCE & GROSJEAN MFG. COMPANY, 19 Cliff street, New York, have been engaged in perfecting an entirely new line of Enameled Ware, which they purpose placing on the market with the new year.

New Jewel Process Range.

George M. Clark & Co., 153 to 161 Superior street, Chicago, have brought out the New Jewel process range, which is illustrated in Fig. 1 of the cuts. It



New Jewel Process Range.—Fig. 1.—General View.

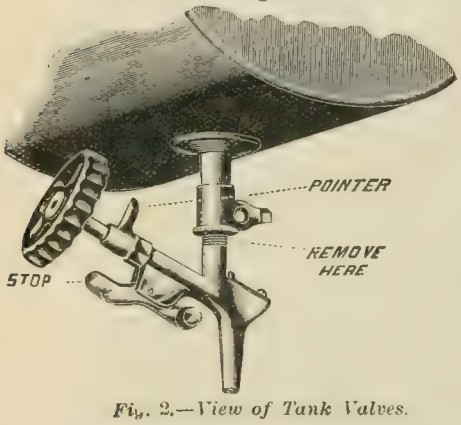


Fig. 2.—View of Tank Valves.

is a compact cabinet range, having no end shelf or step, and is, therefore, adapted to conditions for which the range with a step is found undesirable. It has three burners, two of them being on top and a large one in the oven. The oven has a drop door with a spring balance, so that it closes at a touch. The oven is further constructed on the principle of Jewel portable ovens, with direct heat, and a rear connection is arranged for a small stove pipe to the chimney to carry away the fumes of baking or roasting. The oven burner is entirely inclosed within the oven to insure the utilization of all the heat. The frame of the range is of cast iron, the body of cold rolled sheet steel, drip pans are under all burners, the grates are raised and the range is mounted on casters. It presents a very neat appearance, and is confidently expected to prove a good seller as well as a reliable piece of kitchen furniture.

An illustration is also given in Fig. 2 of the tank valves used on the process stoves of George M. Clark & Co. and made exclusively by them. These valves are thus described in the company's catalogue: "The casting is made of brass, the needle of German silver, and the entire work is machine shop work. This part never goes into the tin shop, but is screwed into the tank fitting after the tank has been received in clean shape from the tin shop. Therefore there has been no heat at the valve, consequently no corrosion from acid or other cause. The needle valve is fitted with a pointer, which is adjusted to stop at the adjustable stop that is attached to the valve casting. In case it is necessary to remove the needle the adjustable stop may be tilted to allow the pointer to pass. The feature of our valve is that each one is separate, and should it be necessary to remove a valve it may easily be done by any one, cleaned and replaced in a very few minutes."

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Metal and Miscellaneous Prices.

CHICAGO, DECEMBER 21, 1893.

Tin—
Straits pigs.....23¢

Imported Tin Plates—
Charcoal Plates.—Bright.

Guaranteed Plates command special prices, according to quality.

		Per box.
Galland and Malyn Grade	IC, 10 x 14	@ $6.75
	IC, 12 x 12	@ 6.75
	IC, 14 x 20	@ 6.75
	IC, 20 x 28	@ 13.50
	IX, 10 x 14	@ 8.75
	IX, 12 x 12	@ 8.75
	IX, 14 x 20	@ 8.75
	IX, 20 x 28	@ 17.50
	DC, 12½ x 17	@ 6.50
	DX, 12½ x 17	@ 8.50
Allaway Grade,	IC, 10 x 14	@ 6.50
"	IC, 12 x 12	@ 6.50
"	IC, 14 x 20	@ 6.50
"	IC, 20 x 28	@ 13.00
"	IX, 14 x 20	@ 8.00
"	IX, 20 x 28	@ 16.00

Coke Plates—Bright.

	Per box.
Steel Coke—IC, 10x14, 14x20	$5.75 @ $5.85
IC, 14x20, 90 ℔	5.50 @ 5.60
IC, 14x20, 100 ℔	@ 5.85
10 x 20	8.75 @ 9.00
20 x 28	11.50 @ 12.70
X, 10x14, 14 x 20	@ 7.35
B.V. Grade. IC, 10x14, 14x20	5.85@ 6.00

Charcoal Plates.—Terne.

Guaranteed Plates command special prices, according to quality.

Mansel and Dean Grades.— IC. 14 x 20	@ $5.62½
20 x 28	@ 11.25
IX. 20 x 28	@ 14.25
Worcester Brand and equal.— IC, 14 x 20	6.12½@ .....
IC, 20 x 28	12.25 @ .....
IX, 14 x 20	7.62½@ .....
20 x 28	15.25 @ .....

American Tin Plates.
Charcoal Plates.—Bright.

Irondale, A. A.—	IC, 14 x 20	$7.00
" "	IX, 14 x 20	9.00
" "	IXX, 14 x 20	11.00
" "	IC, 20 x 28	14.00
" "	IX, 20 x 28	18.00
" "	IXX, 20 x 28	22.00

Florence.—
IC, 10 x 14, 12 x 12, 14 x 20..$6.75
IX, 10 x 14, 12 x 12, 14 x 20.. 8.50

Palma.—
IC, 10 x 14, 12 x 12, 14 x 20..$7.25
IX, 10 x 14, 12 x 12, 14 x 20.. 9.25

Each extra cross $2.00 and 20 x 28 double these prices.

Brilliant, Tissue Packed, IC, 14 x 20	$9.25
Royal, extra, IC, 14 x 20	7.25
Merion, IC, 14 x 20	7.00
Almond, IC, 14 x 20	6.50
Mint, IC, 14 x 20	6.25

Coke Plates.—Bright.

Elwood.—IC, 14 x 20	$6.00
" IC, 20 x 28	12.50

Roofing Plates.

Arch, IC, 20 x 28	@$11.75
Crescent, IC, 20 x 28	@ 12.25
Crescent, IX, 20 x 28	@ 15.25
Empire, IC, 20 x 28	@12.50
Empire, IX, 20 x 28	@15.50
Hickory, IC, 20 x 28	@ 12.75
" IX, 20 x 28	@ 15.75
Alaska (heavily coated), IC, 20x28	@$14.50
Alaska IX, 20 x 28	@ 17.75
Special, IC, 20 x 28	@ 15.50
" IX, 20 x 28	@ 18.50
Merchant's Roofing (extra coated), IC, 20 x 28	@$17.75
Merchant's Roofing (extra coated), IX, 20 x 28	@$21.50
Merchant's Old Method, (extra heavily coated), IC, 20 x 28	@$19.75
Merchant's Old Method (extra heavily coated), IX, 20 x 28	$23.60
Irondale A: IC, 14 x 20	$6.25
IX, 14 x 20	7.75
IC, 20 x 28	12.50
IX, 20 x 28	15.50
Westmoreland: IC, 14 x 20	$6.25
IC, 20 x 28	12.50
Elwood: IC, 20 x 28	$12.00
Juno: IC, 14 x 20	$5.75
IC, 20 x 28	11.50
Illinois, Old Method: IC, 20 x 28	$17.00
E. L.: IC, 20 x 28	$12.50
Jessie: IC, 20 x 28	$12.00
Scott's Extra Coated, Stamped and Resquared, IC, 14 x 20	$9.50
Scott's Extra Coated, Stamped and Resquared, IX, 14 x 20	11.00
Scott's Extra Coated, Stamped and Resquared, IC, 20 x 28	19.00
Scott's Extra Coated, Stamped and Resquared, IX, 20 x 28	22.00
Neville, Stamped, IC, 14 x 20	6.25
" " IX, 14 x 20	7.50
" " IC, 20 x 28	12.50
" " IX, 20 x 28	15.00
Taylor's Old Style, IC, 14 x 20 (Stamped and Resquared)	$9.50
Taylor's Old Style, IC, 20 x 28 (Stamped and Resquared)	19.00
Taylor's Roofing, IC, 14 x 20 (Stamped and Resquared)	8.25
Taylor's Roofing, IC, 20 x 28 (Stamped and Resquared)	16.50
Columbia, IC, 14 x 20 (Stamped)	7.25
" IC, 20 x 28 (Stamped)	14.50
Maple, IC, 14 x 20 (Stamped)	6.75
" IC, 20 x 28 (Stamped)	13.50
Willow, IC, 14 x 20	6.50
" IC, 20 x 28	13.00
Knoxall, IC, 14 x 20	6.25
" IC, 20 x 28	12.50
Globe, IC, 14 x 20	6.00
" IC, 20 x 28	12.00
Miami, IC, 14 x 20	6.00
" IC, 20 x 28	12.00
" IX, 20 x 28	15.00
" (Redipped), IC, 20 x 28	17.00

Tin Boiler Plates.

	Per box of 100 sheets.	Per box of 112 sheets.
X, 14 x 28	$13.00	$13.00
XX, 14 x 28	14.50	14.50
X, 14 x 31	14.50	15.80
XX, 14 x 31	16.50	17.50
X, 14 x 56	29.50	16.50
XX, 14 x 56	32.50	18.20
X, 14 x 60	31.50	17.65
XX, 14 x 60	35.50	20.90

Sheet Iron—
Black.

Nos.	Common American	Refined.
10 to 16	℔ 2 6-10¢	3 2-10¢
17 to 20	℔ 2 7-10¢	3 3-10¢
21 to 24	℔ 2 8-10¢	3 4-10¢
25 and 26	℔ 2 9-10¢	3 5-10¢
27	℔ 3¢	3 6-10¢

Russia, Planished, &c.

Genuine Russia, all numbers....13¢ net.
Patent Planished....℔ D A, 10½¢; B, 9½¢ dis. 5%
Craig's Polished Sheet Steel.....8½¢

Galvanized.

Juniata or first quality..dis.70&7½@10%

Copper—
Ingot.

Lake.....12¢ @ 12½¢
Casting Brands.....11¢ @ 11½¢

Sheet and Bolt.

Discount, 25%.

Copper Bottoms.

Discount, 25%.

Seamless Brass and Copper Tubes.

Base price, 17½¢, Chicago, with extras according to size.

Copper, Bronze and Gilding Tube, 3¢ ℔ ℔ additional.

Brazed Brass Tubing.
(To No. 20 inclusive.)

Add freight from New York to Chicago to these prices, or 50¢ ℔ 100 ℔.

Above 5-16 inch to 3 inch inclu...	35¢
Plain, above 3 inch	45¢
Plain, 5-16 inch	45¢
Plain, ¼ inch	60¢
Plain, 3-16 inch	$1.00
Plain, ⅛ inch	$1.50
Fancy Tubing, Brass, to No. 20 incl.	43¢ ℔
Bronze Tubing, 3¢ ℔ ℔ more than Brass	

40 @ 45%

Roll and Sheet Brass.

Discount, 35 @ 40%.

Slab Spelter—
Western Spelter.....5

Sheet Zinc—
600 ℔ casks.....5 ¢
300 ℔ casks.....5½¢
Loose sheets.....5½¢

Lead—
Soft Pig Lead.....3½¢
Bar.....4¼¢
Pipe.....5½¢, dis. 10¢
Block Tin Pipe.....35¢
Sheet.....6¢, dis. 10%

Solder—
½&½.....12¾¢@13¼¢
Extra Wiping.....11½¢

The prices of the many other qualities of Solder in the market indicated by private brands vary according to composition.

Antimony—
Cookson.....12¢@12½¢
Hallett's.....11¼¢@11½¢

Wrought-Iron Pipe—
List on following page.

1¼ and under, Plain	57½&10%
1¼ and under, Galv	50½&10%
1½ and over, Plain	67½&10%
1½ and over, Galv	57½&10%
Boiler Tubes, list Oct. 24, 1892	65@67½%
Casing, list Nov. 16, 1892	52½%
Inserted Joints Casing, list Nov. 16, 1892	47½%
Steel Boiler Tubes	27½%
Cold Drawn Seamless Steel Tubing	50%

Cast-Iron Soil Pipe—
Cast-Iron Soil-Pipe, Tarred; sizes 2 to 6 inches, inclusive.....dis 70&10%
Other sizes.....dis 60%

Leader Pipes—
Abendroth's Galv. Spiral Riveted.....60%
Austin's Corrugated.....60%
Gordon & Gilbert's Corrugated.....60%
Ritchie's (Galv. Iron only) Cor'd.....60%
Ritchie's Spiral Lock Seam, Galv'd.....55%
Austin's Spiral Ribbed Pipe.....60%
Plain Adjustable Elbows.....60%
James A. Miller Bros. (Galv'd Iron only) Corrugated.....60%

Furnace Fittings—
Discount from Excelsior Steel Furnace Co.'s list.....50%

Steel Roofing—
Perfection.....$3.75 square
Climax.....$3.50 square
The Lloyd Spanish Tiling.....$4.50 square

Metallic Shingles—
Cushman's.....$1.25 square
Merchant & Co.'s Spanish Tiles:
Copper, 14 oz.....$36.00 square
Tin.....$9.75@$14.25 square
Steel, painted.....$9.00 square

Drain Pipe—*Tile.*
Discount from list.....70%

Paints, Oils, &c.—
Deodorized Benzine.....7½@8 ¢
Iron Paint, Bright Red.....℔ D, 2 ¢
" " Brown.....℔ D, 1½¢
" " Purple.....℔ D, 2½¢
" Ground in oil, B. Red ℔ D, 6½¢
" Ground in oil, Red..℔ D, 6½¢
" Ground in oil, Brown ℔ D, 5½¢
" Ground in oil, Purple ℔ D, 6 ¢
Linseed Oil, Boiled, in bbls.....48¢
Linseed Oil, Raw, in bbls.....45¢
Mineral Paints.....2@4¢
Orange Mineral.....10¢
Pure White Lead in Oil.....6¾@7¼¢
Dry White Lead in bbls.....6¼@6¾¢
Red Lead, American.....7@7½¢
Red Venetian, English, dry..$1.65@$1.70
Red Venetian in oil; asst'd cans, 8½¢; kegs.....7½¢
Sipe's Japan Oil, in bbls, ℔ gal.....34¢
Spirits Turpentine, in bbls., ℔ gal..35½¢
Asphaltum, Trinidad Refined, ℔ ton..$45
Tarred Felt, 1 Ply, ℔ 100 ℔.....$1.60
Tarred Felt, 2 Ply, ℔ roll 108 sq. feet.....$1.25
Tarred Felt, 3 Ply, ℔ roll of 108 sq. feet.....$1.70
Roofing Pitch, ℔ bbl. of 300 ℔.....$3.60

NEW YORK, DECEMBER 22, 1893.

The following quotations are for small lots.

Aluminum—
No. 2 Grade Metal, in ton lots..℔ D, $0.75
No 1 (guaranteed to be 98 % pure and over), in ton lots.....℔ D .90
Lots less than 1 ton, 10¢ ℔ D additional.

Antimony—
Cookson.....℔ D, 11¢
Hallett's.....℔ D, 10¼¢@10¾¢

Brass—
Planished.....net
Roll and Sheet.....35@40%

Brass and Copper Tubes
Brazed Brass Tubing—
List May 20, 1889.

	Per D.
Plain, to No. 20 inclusive, above 5-16 inch to 3 inch inclusive	$0.35
Plain, to No. 20, above 3 inch	45
Plain, 5-16 inch to No. 20	45
Plain, ¼ inch	60
Plain, 3-16 inch	1.00
Plain, ⅛ inch	1.50
Fancy Tubing to No. 20, inclu...	43

35@40%

Copper and Bronze Tubing—
3¢ ℔ D more than brass.

Bronze, Tobin—
Drawn Rods for Bolts, Forgings, &c

Over ¼ to 3½ inches inclusive....17¢ ℔ D
Over 3½ to 5 inches inclusive.....18¢ ℔ D

Piston Rods, Finished True, Smooth and Straight.

Over ¼ to 3½ inches inclusive....18¢ ℔ D
Over 3½ to 5 inches inclusive.....19¢ ℔ D

Clips—
Buffalo Damper: Nos. 1, $1.25; 2, 2.50 per doz.....40&10%

Conductors—
Corrugated. *Round or Square—*
Galvanized.....60%
Galvanized, Locked Joints.....60%
Tin.....60%

Spiral Riveted—
Galvanized.....50%

See also *Elbows and Shoes; Eave-Trough Miters; Strainers, Conductor.*

Conductor Strainers—See *Strainers, Conductor.*

Copper—
Bottoms, Pits and Flats....25@25&5%

Ingot.

Lake.....11¢
Ansonia Grade Arizona.....10¼¢
Ansonia Grade Casting.....10¢
Planished......net
Sheet and Bolt.....25&25&5%

Tubes—See *Seamless Brass Tubes.*

Coppers, Soldering—
See *Irons, Soldering*, in Current Hardware Prices.

Damper Clips Buffalo—
See Clips, Buffalo Damper.

Eave Troughs—
Lap or Slip Joint, Galvanized.....60&10%
Lap or Slip Joint Terne.....60%

Eave-Trough Mitres—
Lap or Slip Joint.....list, net

Elbows—
Plain Adjustable—
Tin.....70%
Galvanized.....70%

Crimped Tubing—
Re-Tinned or Galvanized.....35%

Stove-Pipe—
Buffalo Four-Piece.

4½	5	5½	6	7 inch,
$0.78	.87	.90	.99	1.20 per doz..20 %

Elbows and Shoes—
Flat Crimp.

Tin.....35%
Galvanized.....35%

Corrugated.
Flat Crimp.

Galvanized.....60%

Round or Square.

Tin.....60%
Galvanized.....60%

Iron, Sheet—
Black.

	Common American.	R. G. Cleaned American.
Nos. 10 to 16	℔ D, 2.70	3 ¢
Nos. 17 to 20	℔ D, 2 80	3.10¢
Nos. 21 to 24	℔ D, 2.90	3.20¢
Nos. 25 and 26	℔ D, 3	3.30¢
No. 27	℔ D, 3.10	3.40¢
No. 28	℔ D, 3.15	3.50¢
American B. B.	℔ D, 4¢@4½¢	

Russia, Planished, &c.

Genuine Russia, according to assortment.....℔ D, 11½@12½¢
Patent Planished....℔ D, A, 10¢; B, 9¢, 5%
Craig Polished Sheet Steel.....℔ D, 8½¢

Galvanized.

	B. B.
Nos. 10 to 16	70%@70& 2½%
Nos. 17 to 22	
Nos. 23 to 24	
Nos. 25 to 26	
No. 27	
No. 28	
Nos. 29 and 30	

Filter Joints—
Lee's.....33⅓

Lead—
American Pig.....4¢@4½¢
Bar.....4½¢
Pipe.....6½¢, 20%
Tin Lined Pipe.....16¢, 20%
Block Tin Pipe.....37½¢, 20%
Sheet.....7¢, 20%
Old Lead in exchange, 3½¢ ℔ D.

Metal Expanded—
Manufacturers' list No. 5.

Lathing	10%
Fencing, Painted Sheets	20%
Netting, Painted Sheets	20%
Door Mats, Galvanized	25%
Window Guards, Paneled	15%
Tree Guards, Paneled	15%

Mitres Eave-Trough—See *Eave-Trough Mitres.*

Paints Oils &c.—

Lead, Amn. White, in oil	6¾ @ 7¼
Lead, Red, bbls. and ½ bbls	6½ @ 7
Lead, Red, kegs	6½ @ 7
Ocher, American	1 @ 1½
Red, Venetian, American	1½ @ 2½

Linseed Oil:
Raw, ₩ gal..... @ .40
Boiled..... @ .43

Spirits Turpentine:
In bbls..... @ .32

Putty:
In barrels and ½ bbls..... .01¾ @ .01¾
In tubs..... .01⅝ @ .01¾
In tin cans..... .01½ @ .02½
In bladders..... .01⅞ @ .02¼

Roofing Material, &c.:
Asphaltum, Trinidad Refined, ₩ ton..... $30.00@$35.00
Asphaltum, Rock, ₩ ton..... $14.00
Coal Tar Felt, 1 Ply, ₩ ℔..... 2¢
Coal Tar Felt, 2 Ply, ₩ roll 108 sq. ft. $1.42½
Coal Tar Felt, 3 Ply, ₩ roll 108 sq. ft. $1.85
Roofing Pitch, ₩ bbl..... $2.25

Pipe, Drain 50%

Pipe and Fittings, Cast Iron Soil—

Cast-Iron Soil Pipe, Tarred, sizes 2 to 6 Inches, inclusive..... 60@60&10%
Other sizes..... 55@55&10%
Cast-Iron Fittings, Tarred, sizes 2 to 6 Inches..... 60@60&10%
Other sizes..... 55@55&10%

Pipe, Spiral—

Galvanized..... 60%
Tin..... 60%

Rock and Slag Wool—

	₩ ℔	₩ cub. foot
Slag Wool, ordinary	1¼	15¢
Slag Wool, extra	4½	38½¢
Rock Wool, ordinary	2¼	27¢
Rock Wool, extra	7¼	43½¢

Rosin—

Omonom and Good—Strained,
Rosin, C. & D..... ₩ bbl. $1.32@$1.34
Rosin, E. & F..... ₩ bbl. $1.35@$1.45
Rosin, G. & H..... ₩ bbl. $1.55@$1.85
Rosin, I. & K..... ₩ bbl. $1.85@$2.25
Rosin, M. & N..... ₩ bbl $2.80@$3.50

Seamless Brass Tubes..ne

Shoes and Elbows—See *Elbows and Shoes.*

Slate Roofing—

According to size, f.o.b. cars, Quarry Station.

Pennsylvania:
Best Bangor, ₩ sqr..... $3.25@$4.50
Pen Argyle, ₩ sqr..... 3.50@ 4.25
Peach Bottom, ₩ sqr..... 5.00@ 6.25
No. 1 Chapman, ₩ sqr..... 4.00@ 4.65
Lehigh Slates, ₩ sqr..... 3.00@ 4.50
Vermont:
Sea Green, ₩ sqr..... 2.70@ 3.20
Purple, ₩ sqr..... 3.50@ 4.50
Unfading Green, ₩ sqr..... 3.50@ 4.00
Red, ₩ sqr..... 9.75@12.00

Solder and Soldering Fluids—

Solder—

½ & ½..... 13½@14½¢
No. 1..... 11⅝@12 ¢
Prices of Solder indicated by private brands vary according to composition.

Soldering Fluids—

Concentrated Soldering Flux.
f.o.b. New York.
In barrels, ₩ ℔..... 4¢
Smaller quantities, ₩ ℔..... 5¢

Gedney's Soldering Fluid.
In carboys or barrels, ₩ ℔..... 2¢
$1.50 for carboy or barrel; money refunded when returned.

Perfection Soldering Flux.
No charge for package.
Bbls., about 500 ℔, ₩ ℔..... 3½¢
½ bbls., about 300 ℔, ₩ ℔..... 4¢
Kegs, about 110 ℔, ₩ ℔..... 4¢
75¢ extra for keg.
Kegs, about 55 ℔, ₩ ℔..... 4¢ } ½ dis.

Yager's Soldering Salts.
½-℔ bottles, each..... 30¢
Large quantities, per ℔..... 40¢

Spelter—

Western Spelter..... 4½¢@4¾¢
Bertha..... 8¼¢@9¢

Spiral Pipe—See *Pipe, Spiral.*

Stove-Pipe Elbows—*See Elbows, Stove Pipe.*

Stove Polish—See *Polish, Stove.*

Stove Trucks—See *Trucks, Stove.*

Strainers Conductor—

Galvanized..... 60%

Tin, Pigs and Bars—

Banca, pigs, ₩ ℔..... 22½¢
Straits, pigs, ₩ ℔..... 21½¢@22¢
Straits in bars, ₩ ℔..... 22½¢@23¢

Tin Plates—

American Terne Plates—

Alaska (re-squared) IC, 14 x 20..... $7.00
Alderly, extra quality, IC, 14 x 20..6.37½
Allegheny, IC, 14 x 20..... 6.12
" IX, 14 x 20..... 6.38
Apollo Roofing, IC, 14 x 20..... 6.25
" " IX, 14 x 20..... 7.25
Bonus, Extra Coated, IC, 14 x 20... 6.75
" " " IX, 14 x 20.... 8.25
Buckeye, IC, 14 x 20..... 7.00
" IX, 14 x 20..... 8.25
Chicago, IC, 20 x 28..... 11.50
Central, IC, 14 x 20..... 5.37½
Climax, IC, 14 x 20..... 5.70
Columbia, IC, 14 x 20..... 7.00
Crescent, IC, 14 x 20..... 6.00
DeMilt's First New York, IC, 14 x 20. 5.75
" First New Jersey, IC, 14 x 20 5.50
" Mohawk, IC, 14 x 20..... 5.50
Dunlap's Double Dipped, IC, 14 x 20 8.25
" " " IX, 14 x 20 9.50
" Domestic, IC, 20 x 28..... 12.00
" " IX, 20 x 28..... 15.00
Empire, IC, 14 x 20..... 6.12½
Extra Central, IC, 14 x 20..... 5.62½
Flag, IC, 14 x 20..... 5.50
Fort Pitt, IC, 20 x 28..... 11.00
Globe, IC, 14 x 20..... 5.75
Hamilton's Best Redipped, IC, 14x20 9.25
" " " IX, 14x20 10.75
Hickory (Resquared), IC, 14 x 20..6.37½
Juno, IC, 14 x 20..... 5.75
Kensington, IC, 14 x 20..... 6.75
" IX, 14 x 20..... 8.00
Knoxall, IC, 14 x 20..... 6.00
Laufman's Apollo (Resquared), IC, 14 x 20..... 8.12
Laufman's Apollo (Resquared), IX, 14 x 20..... 9.37
Leominster, Extra Coated, IC, 14x20 7.75
Lion (Stamped), IC, 14 x 20..... 6.25
Lula, Best Charcoal, IC, 20 x 28....12.50
" IX, 20 x 28....16.00
Manhattan, IC, 14 x 20..... 7.00
Maple, IC, 14 x 20..... 6.50
Merchant's Old Method (Resquared), IC, 14 x 20..... 9.50
Merchant's Roofing (Resquared), IC, 14 x 20..... 8.50
McKinley, IC, 20 x 28..... 12.00
" IX, 20 x 28..... 15.00
Neville, IC, 14 x 20..... 6.00
" IX, 14 x 20..... 7.25
N. F. Old Style, IC, 14 x 20..... 7.50
" " " IX, 14 x 20..... 9.00
Old Colony, IC, 14 x 20..... 8.00
Optimus, Best Redipped, IC, 14 x 20 8.25
" " " IX, 14 x 20 9.50
Osceola, Hand Coated, IC, 14 x 20.. 8.25
" " " IX, 14 x 20.. 9.75
Palacio, IC, 14 x 20..... 5.55
Pennsylvania Old Method (Treble Coated), IC, 14 x 20..... 8.50
Phœnix, IC, 14 x 20..... 5.30
Scott's Extra Coated (Resquared), IC, 14 x 20..... 9.25
Scott's Extra Coated (Resquared), IX, 14 x 20..... 10.75
Taylor Old Style (Resquared), IC, 14 x 20..... 9.25
Taylor Roofing, IC, 14 x 20..... 8.00
Thomson's Puritan, IC, 14 x 20.....5.75
Tip Top, IC (Resquared), 14 x 20.... 6.62
" IX " 14 x 20.... 7.88
U. S. Monongahela, IC, 14 x 20..... 6.50
U. S. Redipped, IC, 14 x 20..... 9.25
Venux, IC, 14 x 20..... 5.60
Waldo Redipped, IC, 14 x 20..... 7.25
Westmoreland, IC, 14 x 20..... 6.25
Wilkinsburg Redipped, IC, 20 x 28.16.00
" " IX, 20 x 28.19.00
Willow, IC, 14 x 20..... 6.25

American Bright Plates—

Almond, IC, 14 x 20..... $6.25
Brilliant (Tissue Packed), IC, 14x20. 9.00
Climax, IC, 14 x 20..... 6.50
" IX, 14 x 20..... 8.00
Florence, IC, 14x20..... 6.75
Hazel, IC, 14x20..... 5.80
Linden, IC, 14x20..... 6.50
Merchant's Dipped, IC, 14x20.....11.00
Merlon, IC, 14x20..... 6.75
Mint, IC, 14x20..... 6.00
Palma Xtra, IC, 14x20..... 7.25
Phœnix, IC, 14x20..... 6.25
" IX, 14x20..... 7.75
Royal, Extra, IC, 14x20..... 7.00
U. S., IC, 14x20..... 7.25

Imported Terne Plates—

Charcoal.
Dean Grade.—IC, 14 x 20.....@$5.50
20 x 28.....@11.00
IX, 14 x 20.....@ 6.75
20 x 28.....@13.50
Abercarne Grade.—IC, 14 x 20.....@ 5.40
20 x 28.....@10.80
IX, 14 x 20...@ 6.62½
20 x 28.....@13.25

Imported Bright Plates—

Charcoal.
Duty: 2.2¢ ₩ ℔.
Melyn and Caland Grade. IC, 10 x 14.....@$6.50
" " IC, 12 x 12.....@ 6.75
" " IC, 14 x 20.....@ 6.50
" " IC, 20 x 28.....@13.00
" " IX, 10 x 14.....@ 8.50
" " IX, 12 x 12.....@ 8.75
" " IX, 14 x 20.....@ 8.50
" " IX, 20 x 28.....@17.00
" " DC, 12½ x 17.....@ 6.00
" " DX, 12½ x 17.....@ 8.00
Allaway Grade. IC, 10 x 14.....@ 6.00
" " IC, 12 x 12.....@ 6.25
" " IC, 14 x 20.....@ 6.00
" " IC, 20 x 28.....@12.00
" " IX, 10 x 14.....@ 7.50
" " IX, 12 x 12.....@ 7.75
" " IX, 14 x 20.....@ 7.50
" IX, 20 x 28.....@15.00
" DC, 12½ x 17.....@ 5.50
" " DX, 12½ x 17.....@ 7.00

Coke.
Steel Coke.—IC, 10x14, 14x20.....@$5.50
10x20.....@ 8.50
20x28.11.50@12.00
IX, 10x14, 14x20.....@ 6.75
B. V. Grade.—IC, 10x14, 14x20....@ 5.50

Imported Boiler Plates.—

IXX, 14x26..(112 sheets)..... @$13.50
IXX, 14x28..(112 sheets)..... @ 14.50
IXX, 14x31..(112 sheets)..... @ 16.00

Tinning—Brass and Copper.....net

Tubing—Tin..... 55%

Galvanized..... 55%

Brass and Copper.

Standard List..... 35@40%

Troughs, Eave—See *Eave Troughs*

Trucks Stove—

Improved Lock Frame, per doz....$15.00
Steel Lock Frame, per doz..... 18.00
Daisy Improved Pattern, ₩ doz..... 18.00

Zinc—

600 ℔ casks..... ₩ ℔ 5½¢@5¾¢
Per ℔..... 6½

It Is Reported—

That the Hardware store of Brindley, Drennan & Co., Swanton, Ohio, was burglarized on the 4th inst. About $25 worth of goods were taken.

That the Hardware dealers of New Albany, Ind., have donated to that city a supply of Picks to be used in the street repairs.

That William Jenkins' Hardware store, at Oxford, Mass., was robbed on the 31st inst. Razors and Pocket Knives comprised the booty.

That John Holker has retired from the firm of William Holker & Co., dealers in Stoves, House Furnishing Goods, &c., Newburyport, Mass., and William Holker will hereafter conduct the business alone.

That J. M. Schram's Hardware store at Ridgway, Pa., was destroyed by fire on the 12th inst. Loss, $7000; fully insured.

That the Hardware store of A. M. Churchill, Morrisville, Vt., was slightly damaged by a fire in that place on the 13th inst.

That a newsboy, while attempting to sell a paper in S. L. Boyce & Son's Hardware store at Port Huron, Mich., on the 9th inst., entered the office during the bookkeeper's absence, and unlocking the money drawer of the safe, abstracted a pocketbook containing $40. The boy was subsequently arrested.

That F. A. Beltz, Boyd, Minn., has sold a half interest in his Hardware store to P. Golden.

That on the 12th inst. fire destroyed the Hardware store of Bartlett & Mallett, Groton, S. D. Loss on stock, $7000; insurance, $4500; loss on building, $2000; insurance, $1400.

That in the tornado which visited Harrisburg, Ill., on the 15th inst., the Hardware store of J. S. Ferguson was unroofed.

That A. F. Anderson has bought the Hardware store of H. S. Rich & Co., Red Wing, Minn.

That M. M. Davidson has sold his Hardware stock at Tipton, Iowa, to William Muhs of Milwaukee. Mr. Muhs will take possession the first of the year.

That D. Thompson has bought A. H. Nichols' Hardware store, at Marlette, Mich.

That U. P. Solberg has purchased a new Hardware store at Sioux Center, Iowa.

That A. L. Johnson's Hardware store, at Blaine, Wash., was burglarized on the 5th inst. The thieves broke in the side window and carried away about $100 worth of Pistols and Cutlery.

That V. P. Moore, Adairville, Ky., has sold a half interest in his Hardware store to Morris Barker of Keysburg.

That J. W. James has sold his Hardware store at Point Pleasant, Ohio, to Hoopman Bros. of Byesville. Possession will be taken January 1.

That Steer & Church, Coleman, Mich., have purchased S. S. Tower's stock of Hardware and removed it to their store.

That Mr. Yost has recently entered the Hardware business at St. Louis, Mich.

That F. C. Dickson has leased the Weyh Building, Armour, S. D., and will put in a complete stock of Hardware. Mr. Taylor, a nephew of Mr. Dickson, will have charge of the store.

That Grate Bros., Hardware merchants, Carondelet, Mo., hope to have their new brick store completed by the first of the year.

That Huddle & Shoemaker, Ashley, Ohio, have sold out their entire stock of Hardware, Farming Implements, &c., to Wesley McCurdy and John Olds. The firm name will be Olds & McCurdy.

That the Hardware firm of Godley & Watson, Oberlin, Ohio, was dissolved on the 4th inst, and a new partnership formed. Mr. Godley purchased the half interest of Mr. Watson and subsequently sold it to David E. Morris, the firm name becoming Godley & Morris.

That R. W. Maben of Garner, Iowa, has traded his stock of furniture for a stock of Hardware in the southern part of the State.

That the Hardware firms of C. S. Bucktel and S. G. Empey, Tobias, Neb., have consolidated, and will hereafter be managed by C. S. Bucktel. A part of both stocks will be moved to Swanton, and a branch store opened there.

That Baily & Storch, Hardware merchants, Fullerton, Neb., have purchased the Hardware stock of Sprague Bros., Belgrade, Neb., and will conduct it as a branch store.

THE METAL WORKER.

NEW YORK AND CHICAGO.

Saturday, December 30, 1893.

DAVID WILLIAMS, - PUBLISHER

BUSINESS OFFICES:

NEW YORK.....96-102 Reade Street.
PHILADELPHIA.....220 South Fourth Street.
BOSTON .....146 Franklin Street.
PITTSBURGH.. .. Room 509 Hamilton Building.
CHICAGO.... . 59 Dearborn Street, cor. Randolph.
CINCINNATI..... Rooms 22-24 Pickering Building
ST. LOUIS.....Bank of Commerce Building.
CLEVELAND.....312 The Cuyahoga.

BRITISH AGENCY: The Ironmonger, 42 Cannon street, London, England.

The Heating and Ventilating Engineer.

The art of heating as it exists to-day is based rather on accumulated experience than abstract reasoning. To the steam fitter and the furnaceman belong the greater part of the credit of our present successful methods, as on account of the conditions under which they have worked their financial interest has literally compelled them to accomplish the best results with the least expenditure of money. As a consequence, we are in possession of empirical rules for proportioning radiating surfaces, flues, registers and the like with relation to given cubic contents, window and wall exposure. But the rules thus established have led the true scientist to investigations looking to the establishment of experimental constants, factors and formulæ as inimitable as the laws upon which they are based. The science of ventilation has followed far in the wake of that of heating, for human comfort is measured by immunity from cold rather than by freedom from a polluted atmosphere. The action of the one is immediate and serious, of the other extended and insidious. From the expert in heating and the student of ventilation has been evolved the heating and ventilating engineer, a man conversant with things practical and things theoretical, capable of designing, building, installing and operating under any given conditions a system of heating and ventilation that shall be best suited, most satisfactory and most economical. His experience in heating must enable him and his relation to his client must compel him to recommend only that which is best. Improved ventilation has been the work and study of the scientist rather than of the artisan and theory has preceded practice. Ventilation has been considered and improved only after scientific investigation has shown the injurious effects of a polluted atmosphere, has pointed out this cause and suggested the remedy. The creation of public sentiment in favor of better ventilation lies largely in the hands of the expert, and his success in convincing his clients and fulfilling the requirements will be, in great degree, a measure of his ability as a heating and ventilating engineer.

Hard Times and Inventors.

It is asserted by patent solicitors of experience (and it is thought the patent records will justify the assertion) that soon after a recovery from business depression begins to be felt, there is, as a rule, a notable increase in the number of applications for patents. Part of this increase may be attributed to delays caused by financial embarrassments; but the total increase seems greater than can be so accounted for. It appears probable that the additional time afforded for study and invention through temporary stoppage of works or other curtailment of general industry yields a harvest of material improvement. The great pushing-on of the frontiers of progress seems to be urged at such times more vigorously than when shops are crowded with orders and the energies of all are taxed to meet pressing demands. The workers in the field of invention are mostly in the ranks of the employed. The heavy load of financial management is not borne by them, but by those who pay their salaries, and any reduction of their ordinary duties more or less sets free their active minds to originate something new or to perfect what has perhaps long awaited completion.

From the Columbus (Ohio) *Dispatch* we learn that the trade school that is conducted in that city under the auspices of the local Gas and Steam Fitters' Union is meeting with much appreciation. Practical questions connected with plumbing and sanitation are discussed at the meetings of the school, and the exchange of experience proves highly beneficial to the apprentices and tradesmen who avail themselves of the advantage offered. At a recent session of the school the City's Building Inspector and his assistant were present and addressed the students.

The Employment of Idle Money.

The enormous accumulations of loanable funds in our financial centers, says *The Iron Age*, opens a wide field for activity for that clever and useful negotiator, the promoter. He is usually quick to discern the direction into which popular favor can be diverted when the time comes to withdraw funds from deposit in banks and trust companies and employ them in active work promising greater remuneration. It may be acknowledged at once that the time has not yet come when moneyed men have sufficiently recovered from their scare to allow them to take hold of new ventures. But a good deal of preparatory work must be done, and it is probable that where it has not been undertaken it will soon be required. The experience of the past year has been hardly such as to encourage much outside capital to jump into the manufacturing branches which *The Iron Age* represents. Nor is the uncertainty concerning what Congress will do with the tariff calculated to encourage investment. Probably the best chance for fresh capital lies in the rehabilitation of some of the manufacturing plants whose owners have failed. We do not, of course, refer to those undertakings which have been forced into receivers' hands simply through internal quarrels and intrigue. As is well known in the iron trade, there are a number of conspicuous cases of this character. But there are a number of works of recognized vitality and capacity for future money making which can be acquired for much less than the actual hard cash invested in them. Their competitors will hardly regard the infusion of fresh blood into them as a blessing.

To the iron, metal and allied trades the first source of orders has already come through the ability of municipalities to market obligations at fair rates. The manufacturers of pumping machinery, the pipe foundries and others have received quite a number of orders lately. The fact that prices obtained are unprecedentedly low has tempered their enthusiasm.

Another line in which an investing movement has started and is likely to develop very rapidly is the construction of suburban electric railroads. It is well known that many of these have proved very remunerative during their short life, so that the promoter of such schemes can make a very good showing by inference. We expect to witness a very rapid and considerable development in this branch, which will give a good deal of work to our industries.

There seems to be little chance for the promoter of standard steam railroads, because the market for this class of securities is overstocked now and because the majority of the great banking institutions who issue them have still their strong boxes filled with bonds underwritten but not placed by them.

There is quite a good deal of preparatory work going on in building circles, but it will take some time before money freely flows into the old channels of real estate improvement.

There is one point which American manufacturers should consider, when contemplating the contingency of the passage of the Wilson bill, and that is, that the present plethora of money would make it relatively easy to raise capital to back up importing partnerships, even if foreign funds did not eagerly seek such opportunities.

Management of Men and Manufacturing Industries.

FOURTH PAPER.

A Good Boss.

BY THOMAS D WEST.

He is "a good boss" is a term often heard expressed by employees and employers, and any one unacquainted with industrial parlance and significance often attached to expressions would be at a total loss to understand why a man called a good boss by the former should not always be considered the same by the latter.

It must be admitted there is a cause not obvious to many for the varying conception of such qualifications.

"A good boss," to be such in the strictest literal understanding of the term, is a man who will faithfully and justly perform the duties or labor for which he receives pay.

I am aware that the good book tells us "a man cannot serve two masters," but that version was not intended to refer to employers and employees, for they are not two masters for a boss to serve.

There is only one, and he is the man who purchases the product that the combined duties and labor of the boss and workmen produce, and in this light only can "a good boss" be justly considered or admitted.

Will one workman admit another to be a good man if he has not the physical power and brains to ably perform the work for which he receives compensation from his employer? Certainly not. Then why should a boss be called good who does not ably perform the work for which he receives compensation from his employer?

It takes but little thought upon this point to see there is something higher in "a good boss" than is generally conceived of.

I well know the term as applied by some means a boss that is easy, careless and indifferent to the duties for which he receives pay, and I shall endeavor to show in this paper that such men are not good bosses for workmen to even encourage, and if they are not good men for their employers as well, then they should not be permitted to occupy offices of trust and confidence.

Necessity for Proficient and Minor Labor.

In seriously considering the question of manufacture, we cannot but be impressed with the idea that in producing the product of a firm every person from the most minor to the most proficient in their employ has some influence in perfecting the quantity and perfection of the output.

This admitted, we can but in a sense consider the efforts of all essential to effecting the ends sought for, and that the services of the minor, as well as the proficient, must be employed.

Acknowledging we must have the minor and that his labors are necessary to the completion of the product, where can we justly draw the line for the master to commence and the man to leave off?

Man and Master.

Surely not at the boss, for he can only be justly numbered with the proficients and may often be placed as the first of them. His duties may be in having control and directing, but could the effort or labor of those under him be dispensed with any more than his own in producing the firm's finished product? Of course not. Rightly considered, the boss is but the proficient whose duty it is to advise, instruct and push forward the work to the end that the product can be made profitable and sufficiently perfect to be acceptable to the buyer, and who is, when we look squarely at the problem, the true master, for it is the customer that all efforts of any manufacturing enterprise must labor to please.

Blunders and Poor Workmanship.

If work is condemned or found fault with by the purchaser, every one engaged in its manufacture can generally expect to get a dressing or reprimand, the lash being first applied to the highest proficient (the manager), who in turn gives it to the superintendent, he then to the foreman, the latter to the next most responsible. They in turn send it down the line to the most minor. They all get it, the only difference being that the first lashes of the whip are most severe and cutting, and ofttimes go so deep as to cut many out of their positions.

We must now admit, and I think truly so, that employer and employee are not man and master and the efforts of the first two are so in common that no such line should be drawn, and that each is only laboring to the interest of the other in trying to please the buyer.

Mutual Interest and Responsibility.

The main difference, if any, between employer and employee is that the former is now held financially responsible for damages in every form and if the master says he will not accept work, the latter is fairly sure he will at least get his pay, though the lack of same coming to the former may result in ruining him.

The interests of the employer and employee are mutual. They should not be separated, and to clearly illustrate the justice of such an alliance we will suppose all the industries of this country to be under one management and the product only salable to one foreign nation, and not until it would accept the goods would money be forthcoming to pay the employer and expense of manufacture. Such a condition would surely cause employees to think there was something more than figuring "to get in time" necessary to insure them their wages, and seriously impress all with the true conception of who was the real master. Some may say this is an exaggeration. Even so—they cannot dispute but that the present methods of doing business embrace the same principle, the only difference being there are now thousands of managers to oversee production and thousands of masters to purchase the product, and this large division of control and territory gives more of a leeway to dispose of unprofitable and imperfect manufactured products and the employee an opportunity of being disregardful of just duties to his employer who hires him to aid in producing profitable goods that will please the buyer.

If the employee found that by careless and poor management on the part of a boss he were to suffer in not receiving his pay his conception and desire for qualification would be very rigid and much changed from that now generally found.

"A Snap."

A good boss in looking out for the interest of his employer is also looking out for that of the employee, and his goodness cannot be defined by permitting those under him to have "a snap."

He is paid for fulfilling a trust placed in him, and there are many ways in which he can exhibit goodness that will be a hundred times more beneficial to those under his charge than by permitting "snaps" or favors to a few, for as a general thing where such are found existing some are made to suffer for it.

A True Boss.

"A good boss" will not show partiality, but ever stands independent and in a position to say no or yes, or discharge any person upon the "spur of the moment" for a just reason.

He will have higher principles than tolerating clannishness, "snaps" or favors, but will endeavor to do justice to all. There are many ways in which he can dispense goodness and command respect and confidence, though apparently "ruling with an iron hand," and the writer's experience as a journeyman proved that men who were rigid, exacting, and distant with all their men were men of principle, kind to a fault and reasonable in their dealings.

Kindness to Employees.

There are always opportunities arising to give a boss chances to exhibit kindness and consideration for the welfare of those under his charge other than by permitting "snaps" and being indifferent to his duty. If a man gets injured let him see you have feeling and desire to do all in your power to relieve his sufferings. Have his home visited, and if his family require necessaries of life use all your influence to see they are provided for. If slackness compels you to lay him off with no immediate prospects for resuming work, advise and do all you can to get work elsewhere for him. In short, if you learn of his being in any trouble do what you can to help him out. Make friends of your men and get them so attached to your works that they would not wish to leave them.

These are the characteristic points, combined with using effort to seeing that work is turned out profitably and perfect, that go to making a man a "good boss" and for one I would much prefer working for a man of principle, though he might be most exacting in obtaining a big day's work than some, of the insipid, let things take care of themselves bosses that are to be found.

I well know there are bosses who are drivers and have no principle, but the march of progress is making them less every day and time will take care of them.

What is more required is to understand one another and conceive who are the real "men and masters" and what should to both sides justly constitute "a good boss," and when such elements come to be rightly recognized, then, and not till then, will we be on the right road to solve the problem of capital and labor.

Two representatives of the Chinese Government are now in the United States studying the naval and military methods of this country.

The Standard Oil Company are about to begin a vast oil and gas operation in Northern Pennsylvania, where they have leased all the territory where surface indications of oil or gas exist.

THE LETTER BOX.

Noise in Boiler.

From B. & S., *Napanee, Ont*.—We have recently set up a 50 gallon copper boiler and connected it with a range in the ordinary way with ¾-inch pipe, the tubing outside of range boiler being about ½ inch. The connections to boiler are of lead pipe with nipples or connections for ¾ inch pipe. Our customer, who is great on having large pipe, thinks that the lead pipe, being a trifle smaller than the connections, causes the boiler to creak. We thought at one time it was on account of his not using enough water from the boiler. The minute the hot water tap was opened the noise ceased. We have tried cooling the water but it does not make any difference, and some days it is quiet. It seems when it does make the noise that it has the motion of the water works pump. If *The Metal Worker* can furnish us with any information that will lead to a remedy it will be appreciated.

Answer.—Too little description is given of the trouble to locate its cause and suggest a remedy. But from the fact that the noise ceases when the hot water tap is opened, it may be due to a loose part in some of the connections which vibrates under pressure and makes the noise, which stops at times when the part is temporarily secured or when the pressure is removed by opening the faucet. A projecting washer or some irregularity of form in some part would impede the circulation or cause an eddy that would produce noise. A dip or partial obstruction in pipe from a bad joint, causing an air trap, has been known to give rise to rumbling. It is bad practice to use a pipe with smaller bore than the connections in connecting the boiler and water back. Benefit is derived from using a larger pipe for the return to the boiler. If the heated water cannot flow to the boiler as soon as it is heated, steam is likely to form in the water back, making noise when it condenses. Some minor detail of the work will, on careful examination, probably be found to be different from what it should be.

Varying Water Line in Boiler.

From M. E. R., *Tennessee*.—I have just finished a steam boiler with cast iron head and base, made of 1¼ inch extra heavy pipe. The head is 12 inches high. When we have steam on the water line in the water gauge is very irregular, rising and falling continually. Can you through the columns of *The Metal Worker* tell me the cause and suggest a remedy?

Note.—The fact that the water line in a boiler rises and falls irregularly indicates that the circulation within the boiler is bad, and that the current not going continuously in one direction produces eddies and waves that alter the water line. Without knowing the exact construction of the boiler it would be worse than useless to attempt to analyze the particular difficulty in our correspondent's case. We would suggest, however, that careful thought be given to the direction of the heated water as it rises in the boiler, and provision be made for returning it from the top to take the place of the newly heated water without cross currents.

Capacity of Steam Mains.

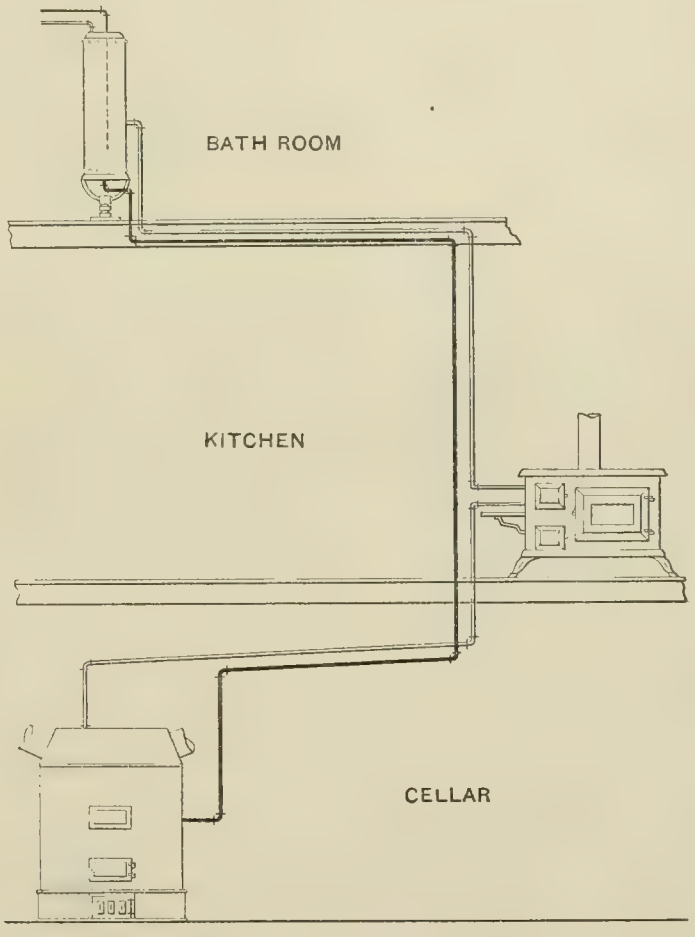
From G. W. A. & Co., *Philadelphia*.—Please give in *The Metal Worker* the amount of radiation the following sizes of steam pipes will carry, ¾, 1, 1¼, 1½, 2, 2½ and 3 inch for low pressure heating.

Note.—A common rule is to use the area of 1-inch pipe for a basis and to allow 100 feet of radiation to a 1-inch pipe. From this basis as many times 100 feet of radiation are used on a main as the area of the main will contain the area of a 1-inch pipe. The amount of radiation given below is calculated from this rule.

Size of pipe	¾	1	1¼	1½ inch.
Amount of radiation	55	100	150	225 sq. ft.
Size of pipe	2	2½	3	inch.
Amount of radiation	400	600	900	sq ft.

Reversed Circulation.

From W. H. C., *Rahway, N. J.*—In answer to the query of "H. R." in *The Metal Worker*, December 2, I would say the connections are made improperly. If the piping is changed so that the circulation will be continuous there will be no reversed circulation. I send a diagram showing how the water can be made to circulate without any possibility of its backing up.



Reversed Circulation.

From G. W. M., *Waynesboro, Pa.*—In reference to the difficulty of "H. R.," in *The Metal Worker* of December 2, the circulation takes the near cut instead of the course offering the greatest resistance. After drawing the fire in the range the circulation continues through the range coil, which completes the short circuit, the temperature gradually falling in the boiler, as only a portion of the flow goes to the fire below. A valve in either pipe to the range will remedy the difficulty. A

system arranged as shown by "H. R." will always work slow and finally reverse and go the wrong way, when it can never heat satisfactorily. I hope I have thrown some light on the subject that will be a benefit to the readers of your interesting, valuable and reliable paper.

From S. H. D., *Watkins, N. Y.*—I notice the article of "H. R." on "Reversed Circulation" in *The Metal Worker* of December 2. Instead of attempting to give a reason for what is said to occur, I beg leave to doubt the statement. If the circulation is reversed between boiler and range it must stop between the heater and boiler or run both ways in the same pipe, which is an absurdity. More likely the circulation occurs between the heater through water front as well as through the boiler. In that case the lower pipe from water front would be about as warm as the upper pipe to front. I suppose there are no other pipes than those shown in diagram of the piping. If "H. R." will place a swinging check valve in the lower pipe from water front of range, so the water can not enter that way, but can come out freely, he can settle the question.

Location of Air Supply.

From W., *Warsaw, N. Y.*—In reply to the letter of "Snips," in *The Metal Worker*, December 2, I would ask him how he would connect a 10 inch hot air pipe with a 9-inch register box. If he will figure the capacity of a 10 x 14 register, less the grating, he will find that it has no more capacity than a 10-inch pipe. If the mouth of a cold air box is located on the opposite side of the house from the prevailing winds, hot air will be drawn from the furnace instead of cold air being supplied.

A Partition Flue Suggestion.

From SUGGESTION, *Boston, Mass.*—Through reading the letters of "P. F." and "Cæsar" in *The Metal Worker* of November 11 and 25, the following idea was suggested to me. Why not let the partition flue extend out into the room to give it size. Surely the fact that the family health and comfort for six months in the year depend on artificial warmth is sufficient to warrant ample provision to be made for a supply, even to the extension of the partition flue into the room. It is a foregone conclusion that neither the architect nor carpenter will listen to this or aid in it if old plans are followed. If an ornamented column of cast iron, terra cotta or sheet metal appeared against one of the walls of a room would it be considered a detraction from the general appearance? It could be partly in the partition, as now, and then would not need to extend into the room half so far as the old flues, and yet could be of twice the capacity. In shape the front could be agreeably varied and the design arranged to suit the room in which the flue was used. Arrangements to receive the register and the finish up to the wall at each side would be simply matters of detail. In price probably the sheet metal flue would be the cheapest and could readily be supplied in lengths that would reach from floor to ceiling. In cast iron and terra cotta the flue would probably have to be made in sections and the joints hidden by the decoration. The flue could be finished in colors to suit the individual taste of the customer. The use of flues of the capacity possible with this flue would enable many furnaces to give better satisfaction and reduce many coal bills. The quantity of air it would carry would aid in ventilation. In fact, the semi-partition flue could be used for a ventilating flue, being placed on the opposite side of the room from the heating flue. The semi partition flue is not patented, so far as I know, giving opportunity for the makers of ornamental sheet metal work and the manufacturers of terra cotta goods to consider the suggestion.

Defective Circulating Plan Proposed.

From S. H. D., *Watkins, N. Y.*—I notice plan of "Defective Circulating" plan contributed by your Fresno, Cal., correspondent. It is a fixed fact that the circulating pipe must be entirely below the lowest water line of the supply tank. Water will not rise in any part of the system any higher than this water line at any time, a fact supposed to be known to every one. "C. W. B.'s" ideas are perfectly correct in regard to the way the connections are to be made to work properly. There is no objection to dropping the return circulating pipe down below the floor if care is taken to have it on a grade either way, but not level or with sags in it. The circulating pipes must be seen the same as if the boiler or tank to be heated was a water radiator, and it will work the same as if it was really a radiator, as the water don't know the difference.

From G. W. M., *Waynesboro, Pa.*—In answer to the inquiry of "C.W.B.," in *The Metal Worker* of December 2, I am positive, from a considerable experience with the kind of work described, that the flow pipe must be brought down or the tank raised so that the flow pipe will enter the tank below the water line. No amount of firing would raise the water in the flow pipe above the natural water level. The return pipe dropping down below the floor and running to the heater is all right and will avoid circulation going the wrong way. "C. W. B." is right in his views, gravity being the whole principle of hot water circulation.

Fails to Heat.

From F. N. P., *Washington, N. J.*—In answer to the inquiry of "R. J. M.," which appeared in *The Metal Worker*, December 9, I would say: Put a stop cock on the pipe from the bottom of the boiler above where the return from the radiator branches into it and he will get circulation through the radiator. When he overcomes his trouble he should send "The Letter Box" an explanation of how it was done.

Angles in Cold Air Box.

From E. A. J. & Bro., *New York.*—There is one inquiry in *The Metal Worker* of December 16 that prompts our answer. The letter was from "J. W. B.," Lexington, Ky., who asked why a cold air connection made with a right angled bend in box, running down the cellar wall and along the floor, should be more satisfactory than when the box was taken on an incline from the opening to the furnace. In the latter case, your correspondent complained that an outward current was felt. This is due to the long rising leg surrounded by the warm air of the cellar. In the former case one side is against the cold wall of the cellar, so that it cannot become heated. Moreover, the inclined box, while rising no higher, is longer and exposes more surface to the heat of the cellar, and therefore becomes more highly heated.

Stereotype Paste.

From D. H. F., *Saginaw, Mich.*—Your answer to my previous inquiry about stereotype metal, published in *The Metal Worker* of December 2, was of great assistance, and now I want to trouble you again for information about stereotype paste and how to keep it from souring.

Note.—We are not sure what our correspondent refers to by stereotype paste, but we think that the paste used in building up the matrix in paper is simply a flour paste. Paste specially prepared for this purpose may be bought in the market. The following receipt for a paste that will not sour may prove of interest to our correspondent: Dissolve 4 teaspoonfuls of alum in 1 gallon of water. When cold stir in as much flour as will give it the consistency of thick cream. Beat smooth. Add 1 teaspoonful of pulverized rosin and 20 drops oil of cloves. Pour the whole into 2 quarts of boiling water and stir thoroughly until cooked. Pour into a glazed earthen vessel, and when cold cover the top with oiled silk and put in a cool place. Take out small quantities as needed for use.

Pattern for Flaring Article.

From A. B., *Richmond, Ind.*—I am a young tinner and would like to have *The Metal Worker* publish a method for obtaining the pattern for a flaring article.

Answer.—If our correspondent wil refer to *The Metal Worker* of November 4, page 44, he will find a method published describing the desired pattern.

Green Water From Copper Tank.

From S. S., *Marcellus, N. Y.*—I notice a letter in *The Metal Worker* of December 23 from "J. H. S.," Richmond, Maine, also your reply. I have had just such occurrences as he speaks of. It took some time and study of the difficulty and a number of experiments to determine what the trouble was. It is simply gas. "J. H. C." will find upon examining the tank in question that it does not fit closely on the sides or ends. It has possibly been bent in moving to clean it or in some other way, so that when the fire is under check the gas can permeate the tank, or, in other words, go through the spaces and under the tank covers. He will also find his tank covers very rusty on the under side. If he will see that the tank is fitted closely to the collar or rim he will have no more trouble. If the tank is a misfit and will not fill the opening properly, he can fill the remaining spaces with stove putty. I have only one request to make; it is this: As I have given him my prescription, I should like to hear from him how it worked.

Pipes from Tank.

From E. H. M., *Jersey City, N J.*—In answer to the inquiry of "M. T. C.," Riverside, Cal., which appeared in *The Metal Worker* of December 23, I would say that after carefully looking over the diagram I find that the trouble is due to an air pocket between the water trap and the top of the tank, which holds up the overflow water by its natural elasticity, and when the cock from the supply pipe is opened into the overflow the air is displaced, and the water in the trap below is moved by the sheer weight of water. The cure for it is to connect to the overflow pipe, at a point where the stop cock now connects, a ¼-inch pipe, and carry it up and over the top of the tank. This will remove the air automatically.

From S. & S., *Sunapee, N. H.*—In the December 23 issue of *The Metal Worker* we notice our brother wind engine man of Riverside, Cal., is having trouble, as he describes it, with the overflow pipe running from tank in the wind mill tower to a cistern 10 feet above the base of tower and 360 feet away. We fully agree with *The Metal Worker* in thinking that it is air bound and that such cases are blind matters to deal with, but from our past experience we feel confident that the trouble may be removed. Offset the pipe just below the tank and carry the same through the bottom of tank to desired hight the tank is to be filled, and bevel top of pipe to at least 45°. This will allow the water to flow in at the lowest point and the air to escape on the opposite side. If it were to be left square on top, it would give the air confined in the pipe an equal pressure on the surface of the opening, and it is not uncommon in such cases for it to cap over with water and overflow the tank, as described by "M. T. C." There is still another way to remove the trouble, and which can be more easily done in this case. Disconnect and remove the elbow where the pipe makes the bend to go into the tank, and replace it with a tee. Reconnect it the same as with the elbow. Then use a short nipple in the upper end of tee, of sufficient length to insure the water not running out at the opening. This will allow an escape for the air as the water passes down the pipe. Our suggestions may not prove equal to this case, but it will be little trouble to make the experiment in the way last mentioned. We would be pleased to learn whether it proved successful or not.

From J. W. C., *Greenfield, Ind.*—In answer to "M. T. C.," Riverside, Cal., in regard to trouble with pipes from tank, I would advise him to attach his waste pipe to the bottom of the tank. Put on a float valve to stop the flow when the water gets as low as he wants in the tank. In this way he will not have any trouble. Furthermore, if there are any air traps, take them out of the pipe to the cistern.

From "J. B.," *Hudson, Mass.*—In reply to "M. T. C.," Riverside, Cal., in regard to trouble with his overflow in wind mill tank, I would advise him to put in a tee at the lowest point in the overflow pipe at the base of the tower, and carry a small pipe, say 1 inch, up vertically about 2 feet above the level of the cistern. This will act as a vent to the pipe, as it is evident that the overflow is air bound. When the quantity of air contained in the overflow is considered, it is a large amount, being over 1225 cubic inches. This quantity of air, or the greater part of it, being underground, is heavier than the surrounding air and needs quite a pressure to move it. As the overflow pipe extends to within 4 inches of the top of tank, there is only the pressure of a column of water 4 inches high, which is equal to less than $\frac{3}{16}$ pound, and which has to force 1225 cubic inches of what might be called dead air out through the overflow, and up grade most of the way. Now, the theory of the 1 inch pipe at the lowest point is that it will give a vent to the air at that point, thus allowing the water to fall down the overflow and the air to escape through the vent. When the water comes to the vent and rises in it, it will have weight enough of itself to force the remaining air out through the pipe to the cistern. I claim that he has proved my theory in the way it works by opening a stop cock between the overflow and service pipe. In the first place, on opening the stop cock A there is pressure enough to drive the air out, as the supply is near the bottom and he has all the pressure in the tank to force the air through, or a pressure of one half as many pounds as the distance to the level of the water in the tank.

From J. W., *Wappinger's Falls, N. Y.*—If your correspondent, "M. T. C.," Riverside, Cal., will turn the overflow pipe down into the tank, more or less, and put on a float or ball valve to prevent the opening of the pipe being uncovered, I think the overflow will be all right, provided the pipe is tight. Or, if practicable, the overflow might be made small enough not to let the water come out as fast as it goes in. At any rate, keep the outlet covered.

Note.—We do not see how the last suggestion will prove a remedy, for if the overflow was of less capacity than the inflow the tank would necessarily fill up and spill over the edge. Perhaps, however, our correspondent had another idea in his mind.

From A. S. B., *Lawrence, Mass.*—In *The Metal Worker* of December 23 is a question from "M. T. C.", Riverside, Cal., who complains that he cannot get the water to run from a tank to a cistern. I think if he will put the pipe intended to fill the cistern through the bottom of the tank to within 4 inches of the top, the water will run to the cistern without any trouble, and I think a 1-inch pipe will be better than a larger one. I think that the trouble with the pipe as arranged is that more air than water enters it, but by passing it through the bottom and using a smaller pipe more water than air will enter. I do not think that air in the pipes will prevent the water from flowing to the cistern if you can get the water into the pipe at the upper end, which cannot very well be done as it is now arranged, for the water will not rise enough to cover the outlet. It seems that the water flows now to the house and barn, and if a cistern pipe is arranged in a similar manner it will work. Perhaps a 1-inch pipe may be too small, but I should use a size that would keep the water from flowing over the tank, and yet keep the upper end covered with water as much as possible without overflowing.

Note.—We fear this suggestion about a smaller pipe will be pretty difficult to follow, for it would be a very nice piece of work to adjust it so that the water would cover the mouth of the pipe and yet not rise to the top of the tank.

A Sensible Movement

The members of the Woman's Protective Health Association, a Philadelphia organization, are evidently not content to merely theorize on sanitary questions. At a recent meeting of the association some exceedingly practical resolutions were adopted and signed by each member, showing that they have a very clear idea of the superiority of prevention over cure. The resolutions were as follows:

"I will have the sidewalk in front of my residence and place of business swept early every morning, and no rubbish shall be swept therefrom into the street.

"2. My ash barrel shall be put out every day at the proper hour and taken in as soon as it has been emptied. It shall be kept within the stoop line, and not on the outer edge of the sidewalk. It shall never be filled so full that it cannot be lifted and emptied into a cart without spilling. To prevent dust I will have water sprinkled lightly over the ashes in the barrel.

"3. I will not mix papers with the ashes and garbage nor throw them into the street. (Paper should be burned, sold or given to a junkman.) I will not throw orange or banana peelings or fruit of any kind upon the sidewalks or into the gutters.

"4. I will be watchful of the general condition of the streets, and if I notice negligence or carelessness on the part of the householders or city employees, I will promptly report the same by mail or in person to the proper officer."

The last resolution shows that the association contemplates an aggressive movement in the matter of street cleaning, which, if intelligently carried out, should lead to valuable results in keeping the householders and municipal employees of the Quaker City up to the mark of their duty in contributing toward the preservation of the public health. A good many other cities might welcome the efforts of a similar sanitary vigilance committee.

Sealed proposals will be received at the office of the Supervising Architect, Washington, D. C., until January 16, for the cut stone work, brick work, floor, ceiling and roof construction and roof covering on the superstructure of the United States Post Office building at Chester, Pa., in accordance with the plans and specifications, copies of which may be had from the Supervising Architect at Washington, or of the Superintendent at Chester, Pa.

The wise man's axiom that "there is nothing new under the sun" applies, it seems, to the electric light, which has done so much of late years to brighten our streets and dwellings. A London journal points out, as a fact not generally known, that the voltaic arc light was known to and exhibited by Sir Humphrey Day in 1805; while, for years later, Albermarle street, Piccadilly, was electrically lighted at the expense of the British Royal Society.

The mule is to be superseded by electric propulsion on the Chesapeake and Ohio Canal as a consequence of the recent successful experiments with the trolley on the Erie Canal.

PLUMBING and GAS FITTING.

Examinations in Plumbing.

At the last examination in plumbers' work in connection with the City and Guilds of London Institute, says the *Architect and Contract Reporter* of London, the following papers were set:

ORDINARY GRADE.

1. (*a*) How would you make a reliable joint between a lead branch and an iron soil pipe? (*b*) How would you make reliable joints in a stack of iron pipe receiving wastes from baths, sinks and lavatories, with hot water supply? (*c*) Describe the cements used for ordinary jointing purposes and their composition.

2. (*a*) Give the composition of ordinary and fine solder, and the melting points of each. (*b*) If a pot of solder is "poisoned," *i.e.*, rendered porous or unworkable by the introduction of some foreign substance, how would you remedy it? (*c*) What fluxes are used for jointing copper, brass, lead and iron to lead?

3. Describe the process of autogenous soldering: when should it be used, and what are its advantages?

4. How should sheet lead be set out and cut in order to line a sink 2 feet long by 1 foot 6 inches wide inside, 12 inches deep at back and sides, and 6 inches deep in front, with 7 pound lead, turned over on top edges 1½ inches all round? Describe or show by sketch. What would be the total weight of the lead? What would be the total weight of the solder you would use?

5. Show what you consider the best possible arrangement of waste pipe from a sink, bath or lavatory, with its discharge to drain.

6. Sketch various forms of defective traps with which you are acquainted, and also improved kinds you would recommend in place of same.

7. The well supply to cistern in an old house having permanently failed, it has become necessary to lay on the supply from the town main; what alterations would have to be made in order to efficiently accomplish this?

8. The drain receiving large quantities of waste water from scullery sinks is frequently choked. What remedies would you suggest?

9. Enumerate the common defects found in water closets which are bad in principle and construction, and show by sketch what kind of fittings you would suggest in place of same.

10. Show or describe what you consider the most complete arrangement of waste pipes and services for a range of three urinal basins with automatic flushing tank over, and proper surface drainage from floors, with the sizes of the various pipes.

11. What precautions would you take in fixing the waste pipe (*a*) from a refrigerator where food is stored, (*b*) from a sink or lavatory?

12. Sketch a lead bend, elbow and set off, and enumerate the various tools required in the formation of same.

HONORS GRADE.

1. What cisterns and pipes would you recommend for the storage and distribution of (*a*) rain water, (*b*) hard water, (*c*) sea water? State your reasons for such selection.

2. Describe the process of manufacture of milled sheet lead and pipe.

3. Show in the accompanying sketch of sectional house, having a water closet on each floor, bath on first floor, lavatory on ground floor and sink in basement, the plumbers' work required and the positions you would suggest for the above mentioned fittings. Describe the form of each fitting you would use, and the size and arrangement of the various service, soil and waste pipes.

4. Show on the accompanying plan what arrangement you would adopt for a complete system of drainage for the house described above, and give the various sizes of pipes, &c.

5. A water pipe running alongside a leaking drain receives an injury: describe the circumstance under which sewage can be sucked into the pipe at the point of injury while the pipe is charged with water. A cistern kept charged with water is situated in the roof of a house having three stories. A service pipe from this cistern supplies a bath on the first floor and a bath on the ground floor. Under what circumstances can water in the bath on the first floor be made to discharge through this pipe into the bath on the ground floor?

6. Describe the principles of a common syphon, and state what is the greatest hight a syphon will draw water when once set in action.

7. It is impossible to obtain a good fall to a system of house drains: what precautions would you recommend to prevent stoppage? What do you consider the best and also the least falls to be allowed for a 6-inch main drain?

8. Describe or show by sketch what methods you would adopt for ventilating a water closet apartment which is not placed next to an external wall, and give your reasons.

9. (*a*) Give some of the causes of "humming" noise in rising mains to cisterns. (*b*) What defects in a system of hot water circulation will cause noises in the pipes, &c.? (*c*) Give causes of concussion in pipes and their remedies.

10. Describe or show by sketch the "cylinder" system of hot water circulation and the "tank" system, and give the advantages and disadvantages of each; explain the reason of hot water circulating in the pipes.

11. Show by plan and sections how you would arrange a lead flat, 22 x 20 feet, giving size of bays and gutters and formation of rolls. What weight lead would you use and what would be the approximate weight of the whole?

12. What precautions would you take for the protection of fittings and service pipes from frost in a country house situated in a very exposed position?

THE FORMER FIRM of Frost, Ware & Taylor, doing business in Holyoke, Mass., have petitioned in insolvency, in order to wind up the partnership accounts.

Domestic Electrical Work.—V.*

BY W. A. W.

ANNUNCIATORS AND ALARMS.

In the electrical annunciator we have an instrument which has nearly if not quite as wide a range of application as has the electric bell. In large houses it can be used in connection with the door bells to indicate the door from which the call comes; it is used on elevators to indicate the floor at which the elevator is wanted; it is indispensable in the modern hotel; it is used in the office, the kitchen, in connection with automatic fire alarms and burglar alarms—in fact, to use an old threadbare expression, its uses are "too numerous to mention."

In hotel work No. 16 and 18 double covered annunciator wire should be used (all circuits which have been and are to be described are assumed to be on new work where all parts are accessible). The first thing to do is to lay out the shortest route for the battery wire which should be No. 16. It should start from the battery and run through the building in much the same manner as the main pipe for water or gas is run, so that splices can readily be run from it to each separate room. The furthest end of this wire may either terminate in one of the push buttons, or it may be left in some accessible place for future additions. Having run the main battery wire the push buttons should be located next. These are usually placed close to the casing of the door leading into the hall and about 4 feet from the floor. Should there be no solid backing to fasten the push to, it is best to nail a 3 inch strip of wood between the studding. Through this bore a ½ inch hole where the push is to go; drive a nail alongside of it to wrap the ends of the wire on. In high buildings it is more convenient to run a main wire along the hall of each floor, and connect all together at any suitable point.

All the preliminaries being arranged the next thing in order is to start from the location of the push with a No. 16 wire (bringing the end out through the ½-inch hole in the wood strip nailed between studding and wrapping the end around the nail) and running up or down between the studding as the case may require, splicing on to the main wire at the nearest point. Right here it may be well to say that too much care cannot be exercised in making these splices. It being assumed that when the building is finished all wires will be either behind lath and plaster or between floors, the work should be put in with a view of making it as permanent as the building itself. To make a good job all splices should be soldered (using resin as a flux; never use acid). Then cover the bare splice with a layer of thin paper, followed by a good tight wrapping of rubber tape. This is the nearest practical approach to a perfect job we have as yet seen. Of course the

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ideal job would be one continuous wire of the same metal, but this comes near enough for all purposes.

The next thing in order is to run a No. 18 wire from each post direct to the annunciator. None of the wires should be bunched or twisted together if it can possibly be avoided, especially in damp places or where rats or mice have access to them, with the possibility of these pests gnawing off the insulation and causing a great amount of trouble and confusion, which is often very difficult to locate and remedy. If bunching is necessary it should be done very loosely. It sometimes happens, however, that the electrician is confronted by the absolute necessity of bunching his wires tightly in order to pass some obstruction in his path. When such is the case the wires should be wrapped with rubber tape where they squeeze together, or what is better still, a piece of soft rubber tubing may be slipped over each wire. This tubing can be purchased from $\frac{1}{32}$ inch in diameter up, and all things considered it is perhaps the safest and cheapest thing to use in dangerous places. Staples for fastening the wires in concealed work should be used very sparingly, as it is much better to leave the wires rather loose. The practice of drawing wires tight and fastening in that position should be avoided as the settling of a building is liable to break a wire and cause a great deal of annoyance. Close attention to detail is very essential in electrical work, and it should be the study of the electrician to prevent rather than cure defects, and no stronger argument can be made in favor of anything than that it can be depended on to do its intended work at all times without fail. Nothing will cause an article of real merit to gain in public favor so quickly as the fact that it is never out of order.

Sometimes a great deal of time can be saved by running a number of wires from a certain part of the building at the same time, which makes it often difficult to keep track of the wires and the rooms to which they run. It is therefore desirable to get as many different colors and combinations of colors of wire as possible, and dividing the building off into sections use a different colored wire for each room in a section; or each section may be wired with one color and the connections made on the annunciator in the following manner: Suppose section No. 1 contains rooms numbered from 1 up to 25. When all is ready and a wire has been run from battery to battery connection on the instrument, connect these 25 wires at the bottom or highest numbers on the instrument. Suppose the annunciator is made for 100 rooms, connect these 25 wires from No. 75 up. Next the buttons in the rooms they are connected with should be pressed, beginning with No. 1 and continuing up to No. 25 in rotation, a helper at the instrument noting down the numbers in rotation as they fall. After all the buttons in the section have been pressed, open the base of the instrument and transfer the wires to their proper places. Knowing that the first call came from No. 1, by referring to the numbers as they fell in rotation when the buttons were being pressed, it will be an easy matter to do this. Suppose the first number that fell on the annunciator was 81, it is evident that this wire should be transferred to No. 1 on the annunciator, and so on.

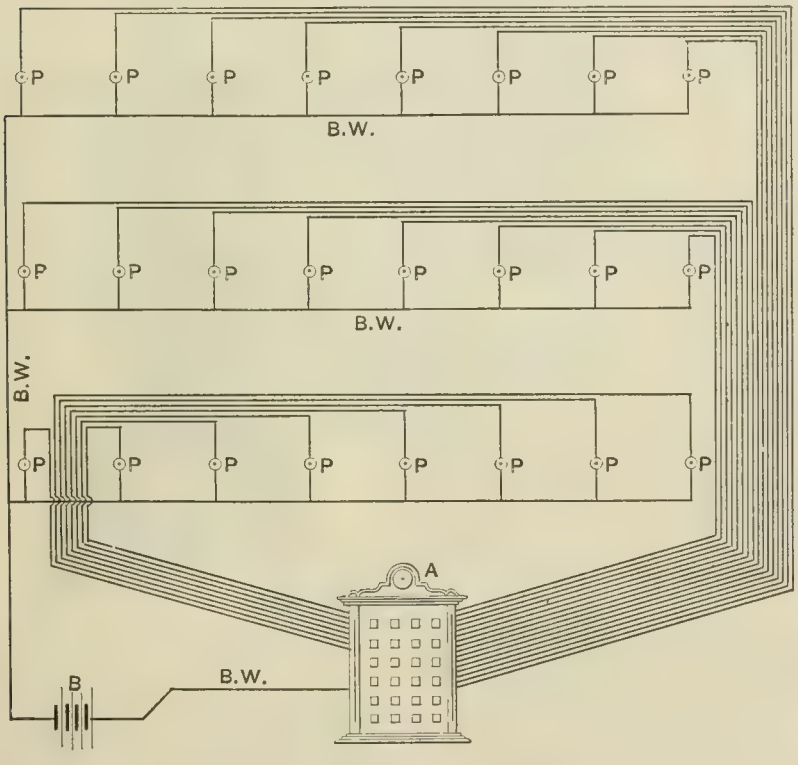


Fig. 12.—Annunciator Circuit.

The diagram, Fig. 12, shows a simple annunciator circuit with 24 room connections. A is the annunciator, B the battery, and P P P are the pushes in the rooms. The wires marked B W are the battery wires, while all the wires starting upward from the pushes are return wires. For a hotel building of say about 100 rooms, where not more than four or five bells are likely to ring at the same time, a battery of five cells connected in series will be sufficient.

Benjamin C. Smith, 275 Pearl street, New York, issues under date of December 20 his Catalogue No. 10, a catalogue and price-list of porcelain enameled iron bathtubs. A variety of different patterns of tubs are shown; also sitz baths, foot baths, showers, &c. Together with the illustrations are given tables of sizes and prices.

Chicago Master Plumbers.

There was a large attendance at the meeting of the Chicago master plumbers held at their rooms 197 Madison street, Tuesday afternoon, December 26. The report of the Executive Committee on the revision of the constitution and by-laws was adopted. The Executive Committee will hereafter consist of the president, vice president, secretary, treasurer, sergeant-at-arms, retiring president and three members to be annually elected to serve with them.

The following nominations were made for the officers to be elected at the meeting to be held January 8, at 2 o'clock p.m.: President, Paul Redieske; vice-president, Chas. J. Herbert, Thos. Conway; secretary, A. W. Murray; treasurer, P. Sanders, D. J. Rock, J. G. Webber, C. C. Breyer, Robert Griffith; sergeant-at-arms, W. H. Commings, G. A. Larson, P. T. Morrisey, C. J. Boyd, Charles T. Byrne, J. J. Doyle; executive committee, Robert Griffith, P. M. Murphy, M. L. Mandable, C. C. Breyer, D. J. Rock.

Missouri Master Plumbers.

In response to a call issued some weeks ago by J. M. Life of St. Louis, State vice-president of the National Association of Master Plumbers, a number of master plumbers met December 18, at the Builders and Traders' Exchange, Kansas City, for the purpose of organizing a Missouri State Association of Master Plumbers. The meeting was called to order by E. D. Hornbrook, president of the local association, who made the delegates an address of welcome. L. B. Cross of E. D. Hornbrook & Co. was elected temporary chairman. The Committee on Credentials appointed by him reported the following delegates: Captain H. Goss, L. B. Cross, George Kirtley, Dent Yates and L. Farley, Kansas City; J. A. Benson and George C. Wilcox, Nevada; T. T. Gray, Sedalia; T. Bristol, William Downs, M. W. Jackson, J. T. Hopper, J. Flin, J. W. Powers, St. Joseph; J. Sheehan, M. J. Ward, J. B. Kelleher, William Schwehn, Jr., J. M. Life, W. H. Kuhns, St. Louis; William Shidy, Chillicothe; W. H. Brown, Lexington, and T. H. Branhan, Hannibal. The constitution and by-laws of the New York Master Plumbers' Association were placed before the delegates and after a few changes adopted. The following officers were then elected for the ensuing year: L. B. Cross, Kansas City, president; J. W. Powers of St. Joseph, vice-president; J. P. Kelleher of St. Louis, secretary; Henry Goss, Kansas City, treasurer. The Executive Committee is to consist of these officers and and the three following delegates at large: T. T. Gray, Sedalia; Harry Cooper, Springfield; J. M. Life, St. Louis.

Wm. Allen will begin visiting the plumbers in the interest of the McCambridge Company, Limited, 522-527 Cherry street, Philadelphia, with the new year. The Sycho closet and plumbers' fine brass goods will be his leaders, with a full line of plumbers' supplies to meet the regular demand.

TRAPS AND VENTS.

J. L. McShane of J. L. McShane & Co., Pittsburgh, last week took a number of master plumbers in a special car to the city poor farm to inspect the $50,000 plumbing job recently completed there. In the party were: James G. Weldon, James Hay, J. P. Reinecke, O. H. Stinson, J. M Tate, John Cowley, James Anderson, Joseph Rice, Frank McKnight, James O. McGinness, I. K. Becker, Wm. Chandley, Charles H. Humbert, George Sands, Joseph Weldon, Louis Heilig, S. W. Hare, John Kelly, and John Farrell.

Mrs. Fitton, Bellaire, Ohio, has purchased the plumbing establishment of her late husband and will continue the business at the old stand.

Fred Baldner and James Fletcher have purchased the Richard McBride plumbing establishment on East Main street, Xenia, Ohio. They will add to the stock of pumps, &c., and will be prepared to do any kind of plumbing work.

E. P. Young, 28 North Sixteenth street, Philadelphia, in plumbing the Rittenhouse apartment house, used 70 of the Standard Mfg. Company's enameled baths and 75 Bourse siphon jet water closets, made by the J. D. Johnson Company, 139 North Seventh street, Philadelphia, who supplied the materials.

Louis Wanner, 106 North Sixth street, Philadelphia, whose sample room shows that he makes a specialty of fine plumbing, has recently completed the plumbing in the residence of J. Stahl. He fitted two bathrooms with tile floors and walls, Standard Mfg. Company's enameled baths and closets and lavatories. A Cummings filter is used on the water service to purify all of the water used in the house.

Froelich Bros., 142 North Seventh street, Philadelphia, are receiving carloads of soil pipe and fittings and 1000 Philadelphia plain hopper closets as an addition to the large line of plumbers' supplies which they carry.

Stambach & Love, 52 North Seventh street, Philadelphia, report a satisfactory year as a result of their endeavor to supply the plumber with whatever he requires for his work.

After long agitation for cheaper gas the inhabitants of the Quaker City have at last succeeded in securing a reduction of the price to $1 per 1000 cubic feet. The gas supply of Philadelphia is mainly in the hands of the city government, and hitherto $1.50 has been the municipal charge. The Common Council, yielding to the popular demand, have, however, passed an ordinance this week making a cut of 50 cents per 1000 in the price of the illuminant. This means, at the present ratio of consumption, a decrease of some $500,000 in the city's revenue: but it is claimed by the advocates of cheaper gas that the increase in consumption will easily counterbalance the problematical loss and leave a handsome profit to the city. About 66 per cent. of the dwelling houses of Philadelphia are at present unfurnished with gas, mainly owing to its high price, and the majority of them will, it is believed, now make use of this illuminant.

The Mason Regulator Company of Boston have made three additions to their engineering series. No. 4, "Electricity for Engineers," contains such facts about electrical machinery as every engineer who has it under his charge needs to know; also all the rules of the Underwriters' Union for the installation of electric plants; 50 cents, post paid. No. 7, the "Engineers' Log Book," for keeping an accurate and systematic record of the engine room; 50 cents. No. 8, the "Chief Engineers' Record Book," for keeping the record of the mechanical plants of large factories; 75 cents.

HEATING AND PLUMBING.

NEW WORK AND CONTRACTS.

A contract for heating the new Presbyterian Church at Clinton, Mass., has been awarded to the Hub Plumbing, Heating & Stove Company.

George Schissler is putting the finishing touches to his contract for placing the steam heating apparatus in the city buildings at Mansfield, Ohio.

M. D. Lawrence, Westfield, Pa., has secured the contract for putting in the furnace and heating apparatus of the new M. E Church at Galeton, Pa.

The contract for the steam heating and plumbing for the new Deaf and Dumb School now in course of erection at Morganton, N. C , has been awarded to the Brewster Hardware Company, Raleigh, N. C.

Clarkson, Scott & Co., 118 Custom House Place, Philadelphia, recently used 2500 feet of radiation and O. K. boilers in the large residence of M. Kohler at Jenkinstown, Pa.

Thompson Bros., 112 Broad street, Philadelphia, have received the contract at $4500 for heating the Temple College, at Broad and Berks streets, Philadelphia. They will use the Sturtevant blower system of indirect steam.

The Baker & Smith Company, 193 to 197 Van Buren street, Chicago, have placed a hot water heating plant in the offices of the Mechanical Rubber Company, 230 Randolph street.

The Smith & Anthony Stove Company, 217 Lake street, Chicago, have installed two Hub hot water heaters in the residence of F. Heinig, Winnetka, Ill., and one in the residence of C. M. Day, Glencoe, Ill.

The Lovell street and Woodward avenue schools, Kalamazoo, Mich., are to be provided with eduction closet ranges, furnished by the Walcott-Hurlbut Company, 175 and 177 Lake street, Chicago.

The Parkersburg Supply & Plumbing Company, Parkersburg, W. Va., were recently organized for the purpose of carrying on a plumbing, steam and gas fitting business and dealing in supplies. The capital is $25,000 and the incorporators are J. W. Roberts, J. H. Cole, W. M. Cox, Lysander Dudley and G. H. Cole.

The steam heating plant erected at the Sutton town poorhouse, Sutton, Mass., by L. White & Son of Oxford, Mass., in which a Richmond Victor boiler was used, was recently inspected by District Inspector Dyson and found to be in every way satisfactory. Messrs. White & Son have also just completed the piping of a house and barn at the same place for water furnished by a wind mill erected by Smith & Winchester of Boston, Mass.

Among recent steam heating apparatus installed by H. E. Heath of Lynn, Mass., were the following business blocks: Dearborn Bros. & Co., Central Investment Company, J. L Libbey & Son and the Tapley Estate, besides 24 residences in Lynn in which Exeter radiators were used.

The Imperial Oil Heater and Cooker.

This new candidate for favor, of which an illustration is herewith presented, is manufactured by the R. J. White Mfg. Company, 40 and 42 State street, Chicago. It is extremely simple in its construction, and is spoken of as a remarkably powerful heater for its size. It is constructed with a cast iron base and a sheet iron drum. The drum is perforated at the bottom for the admission of air, which is discharged after being highly heated through other perforations at the side near the top. A nickel-plated dome covers the top. It is removable, and the stove can then be used for cooking, heating flat irons, &c. The drum can also be removed easily, and the full use of a lamp of 400 candle power is then available for illuminating purposes. The lamp has a circular wick, receiving air through the base. When running at its greatest capacity the fount of the lamp does not become heated. One size is made, but founts are furnished in either nickel or brass, as preferred. The manufacturers make a special point of the low price at which this stove is supplied to the trade.

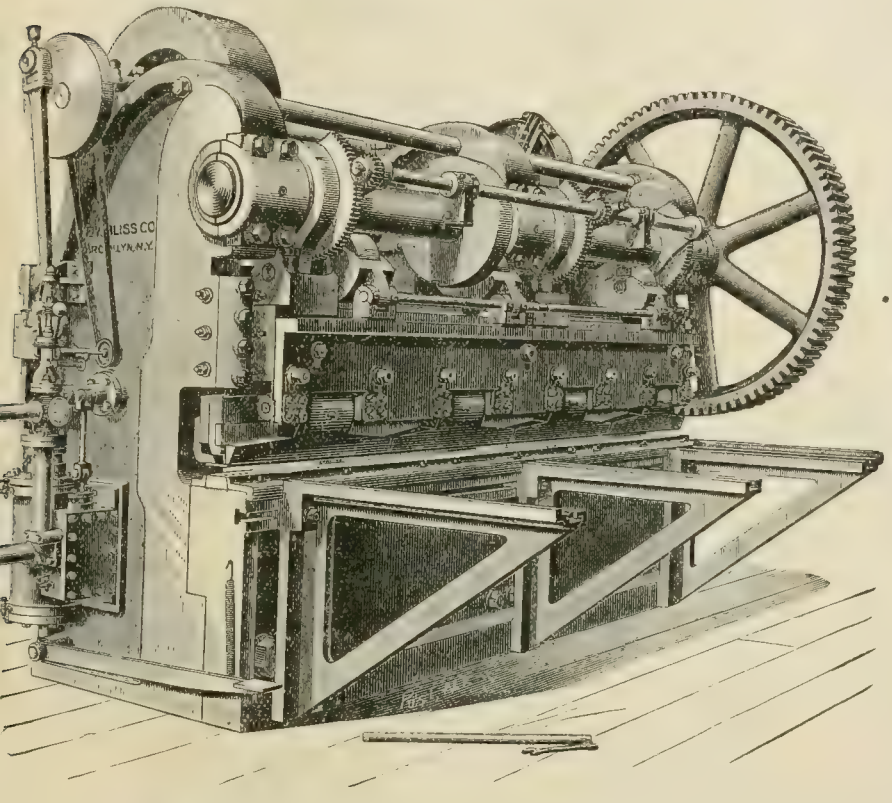
The Imperial Oil Heater and Cooker.

According to a press dispatch from Bennington, Vt., the Vermont Slate Trust will not organize for 1894. Some of the workers desire, it is said, to sell their stock on hand, and will refuse to sign the contracts, trusting that with a reduction of prices they can dispose of their surplus. The quarries that are uncontrolled by the trust are now working full time.

The Salvation Army in San Francisco recently undertook to sift the truth of the rumors about the large numbers of unemployed workingmen alleged to be in that city. It offered work at $1.40 a week and found no takers. The *Coast Seamen's Journal* does not think the test was a fair one.

Engine Driven Gang Punching Machine.

The accompanying illustrations show a punching machine intended especially for punching a large number of holes at one stroke, Fig. 1 showing it as arranged for punching 150 holes ¼ inch diameter through iron ¼ inch thick. The vertical engine at the loft gives motion to the crank shaft at the top of the machine, there being on this shaft a friction clutch which is thrown in and out by a foot treadle and gives the operator complete control of the machine. When the crank shaft has made one revolution a cam throws out the friction clutch and applies the brake, thus stopping the machine at the highest point. The adjustment of the slide is actuated by two cams on the crank shaft, which cause it to descend before the punches, holding the sheet and straightening it during the punching action. Fig. 2, which is a section of the slide and die, shows the construction of this stripper. The main advantage of this stripper is that it permits of using shorter and consequently stiffer punches. By making the front portion of this stripper in sections, as shown, it is possible to easily renew punches which have been bent or broken. As will be seen from Fig. 2, these portions of the stripper are hinged and can be swung forward easily. The



Engine Driven Gang Punching Machine.—Fig. 1.—General View.

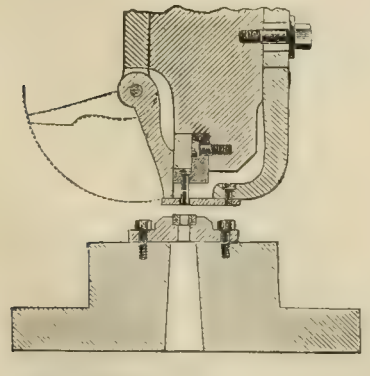
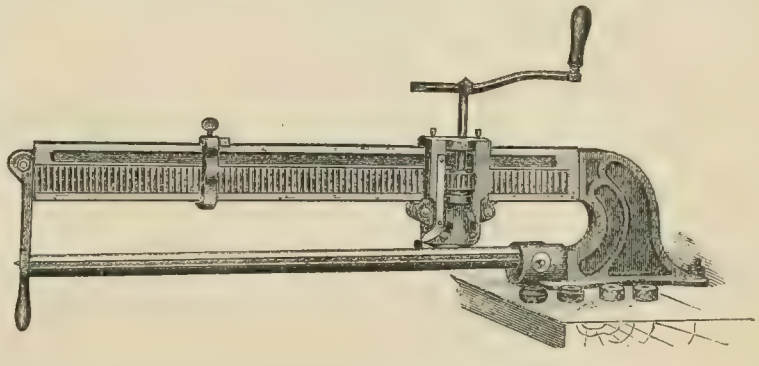


Fig. 2.—Section of Slide and Die.

is effected by means of an eccentric disk interposed between the crank pin and the pitman, which eccentric disk is actuated by means of the pinion shaft shown in front of the main shaft in Fig. 1, this shaft being turned by hand by means of a ratchet which is permanently attached to it. Another special feature in this machine is the cam actuated stripper. This stripper



Queen City Grooving Machine with Round Horn.

principal dimensions of the press are as follows: Length of table, 154 inches; width of table, 12 inches; length of slide, 154 inches; stroke, 2 inches; diameter of shaft, 8 inches; diameter of eccentric, 10 inches; back gearing, 1 inch to 28 inches; total weight, about 60,000 pounds. It is made by the E. W. Bliss Company, 16 Adams street, Brooklyn, N. Y.

Sealed proposals will be received at the office of the Supervising Architect at Washington, D. C., until January 12, for the stone work and terra cotta work, iron and wood floor, ceiling and roof construction, roof covering, &c., for the superstructure of the United States Post Office building, Columbus, Ga. Copies of the drawings and specifications may be obtained from the Supervising Architect at Washington or at the office of the Superintendent, Columbus.

Queen City Grooving Machine with Round Horn.

The accompanying illustration shows the Queen City grooving machine with removable round horn made by the Niagara Stamping & Tool Company Buffalo, N. Y. The round horn is 1¾ inches diameter to accommodate 2-inch conductor pipe. The carriage with the flattening and grooving rolls moves over the work, thus making it convenient for the operator. The machine grooves and flattens the seam at the same operation, thereby doing away with the necessity of hammering down with a mallet, and the seam is said to be perfect in tightness and appearance. The grooving roll can easily be removed and replaced by another with groove of different width. Rapid adjustment is provided for regulating the pressure of the rolls upon the seam, also a clamp to hold the sheet at the starting end. The round horn is fastened in a socket by means of set screw and can be turned to either side or removed altogether. At the will of the operator the groove can be put on the inside as well as on the outside of the work. For inside grooving a flat roll is used and the metal is pressed into a groove on the round horn. On the horn there are four grooves of different widths to accommodate different sizes of seams. A hinged latch connecting the upper bar with the horn adds to the stiffness of the machine. This groover will take in work up to 32 inches in length.

According to the annual report on the Director of the Mint, just published, there has been an increase of $318,295,000 in the aggregate circulation of gold and a decrease of $111,600,000 in the aggregate of silver if the principal countries of the world during the 12 months covered by his report. He puts the gold circulation of the world at $3,901,900,000, and that of silver at $3,931,100,000.

The Bishop of Urgel, in the European republic of Andorra, recently prohibited and anathematized the installation of telephonic apparatus and other supernatural and diabolical electrical necromancy.

THE TIN SHOP.

Patterns for Double Elbow to Connect Two Boilers.

From J. J. H., *Anaconda, Mont.*—Inclosed find the half elevation of a double elbow to connect two boilers, for which patterns are required. The various dimensions of parts are given in the half elevation.

Answer.—An inspection of the half elevation, Fig. 1, shows that sections 1 to 4 are similar to an ordinary pieced elbow, excepting the miter line E Q E1. The profile for this part of the article is indicated by A O A1. Sections 10 and 11 also conform to this profile. As only the half elevation of article is shown, patterns will be obtained for certain sections to the left of center line L N. The large end of article, as indicated by K L, is round, and one-half of this is shown from K to K1. As sections 1 to 5 and 10 to 11 conform to profile A O A1, and section 9 represents the straight pipe, sections 6 to 8 will be given the necessary taper. In Fig. 2 is presented a duplicate of the first four sections of the article, and the half patterns of sections 1 and 4 are shown.

To obtain the patterns proceed as follows: For the pattern of section 1 divide the profile A O A1 into any convenient number of equal parts, and, with the blade of the T-square placed parallel with A B, drop lines from the points thus obtained, cutting the miter line B B1. On A A1 extended lay off the stretchout line A3 A4, as shown, through the divisions in which draw the usual measuring lines. Place the T-square so that the blade shall come parallel to the stretchout line, and, bringing it against the several points in the miter line B B1, cut corresponding measuring lines. Then the line B3 B4 traced through the points thus obtained forms with A3 A4 the half pattern of section 1. For the pattern of section 4 proceed as follows: From the points in B B1 carry lines parallel with B C, C D and D E,

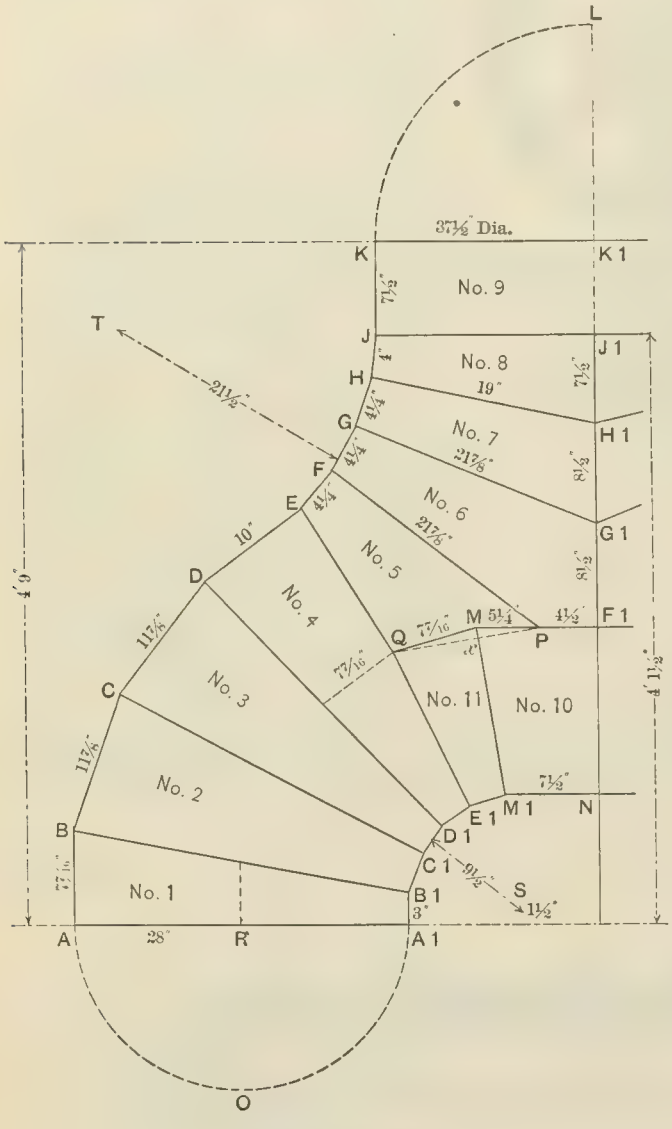


Fig. 1.—Half of Elevation.

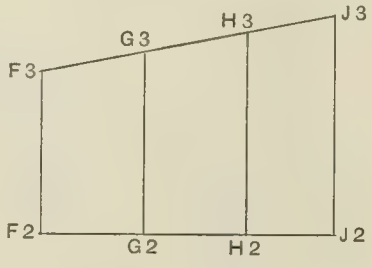


Fig. 3.—Hights on F1 J1 of Elevation.

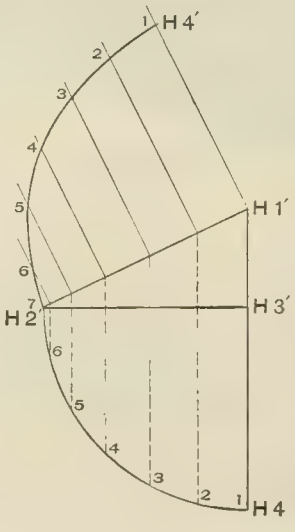


Fig. 4.—Method of Obtaining Shape on Miter Line H H1.

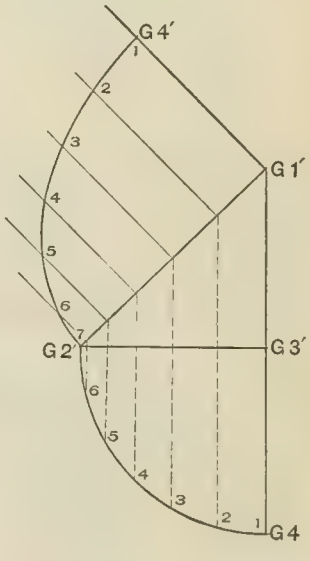


Fig. 5.—Method of Obtaining Shape on Miter Line G G1.

PATTERNS FOR DOUBLE ELBOW TO CONNECT TWO BOILERS.

cutting E *e* E1, as shown. At right angles to D E lay off a stretchout of A O A1, as shown by *e d*, through the points in which draw measuring lines in the usual manner. Place the T-square so the blade will be parallel to the stretchout line *e d*, bring it successively against the several points in the miter lines D D1 and E *e* E1, and cut the corresponding measuring lines. file of large end, and connect F3 J3. If it is not desired to have the line F3 J3 straight, as shown, G2 G3 and H2 H3 can be extended so that F3 J3 will represent a curve. An inspection of Fig. 1 will show that the shape of miter line J J1 is represented by K L. To obtain the shape on miter line H H1 proceed as follows: Draw the right angle H2′ H3′ H1′ in Fig. 4, and with length of lines in H2′ H3′ H4 and transfer the distance to lines of similar number drawn through H2′ H1′. A line drawn through the points thus obtained, as shown by H2′ H4′, will complete the quarter ellipse, or shape on line H H1 of elevation.

The shape on miter line G G1 of elevation is shown by G2′ G4′ in Fig 5, and is obtained in a similar manner.

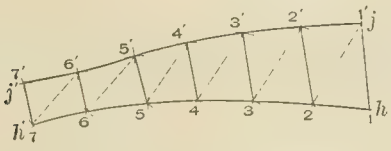


Fig. 10.—*Pattern for Section* 8.

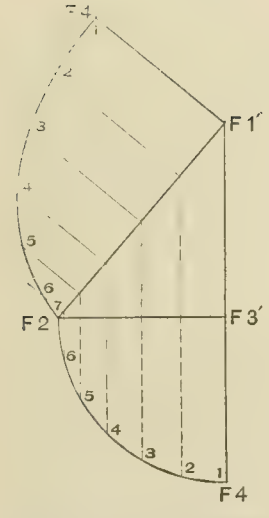


Fig. 6.—*Method of Obtaining Shape on Miter Line F P.*

Fig. 7.—*Method of Obtaining Pattern for Section* 8.

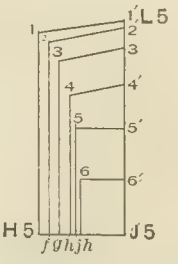


Fig. 8.—*Divisions Represented by Solid Lines in Fig.* 7.

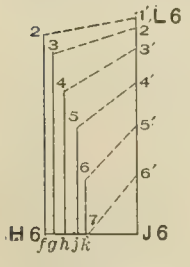


Fig. 9.—*Divisions Represented by Dotted Lines in Fig.* 7.

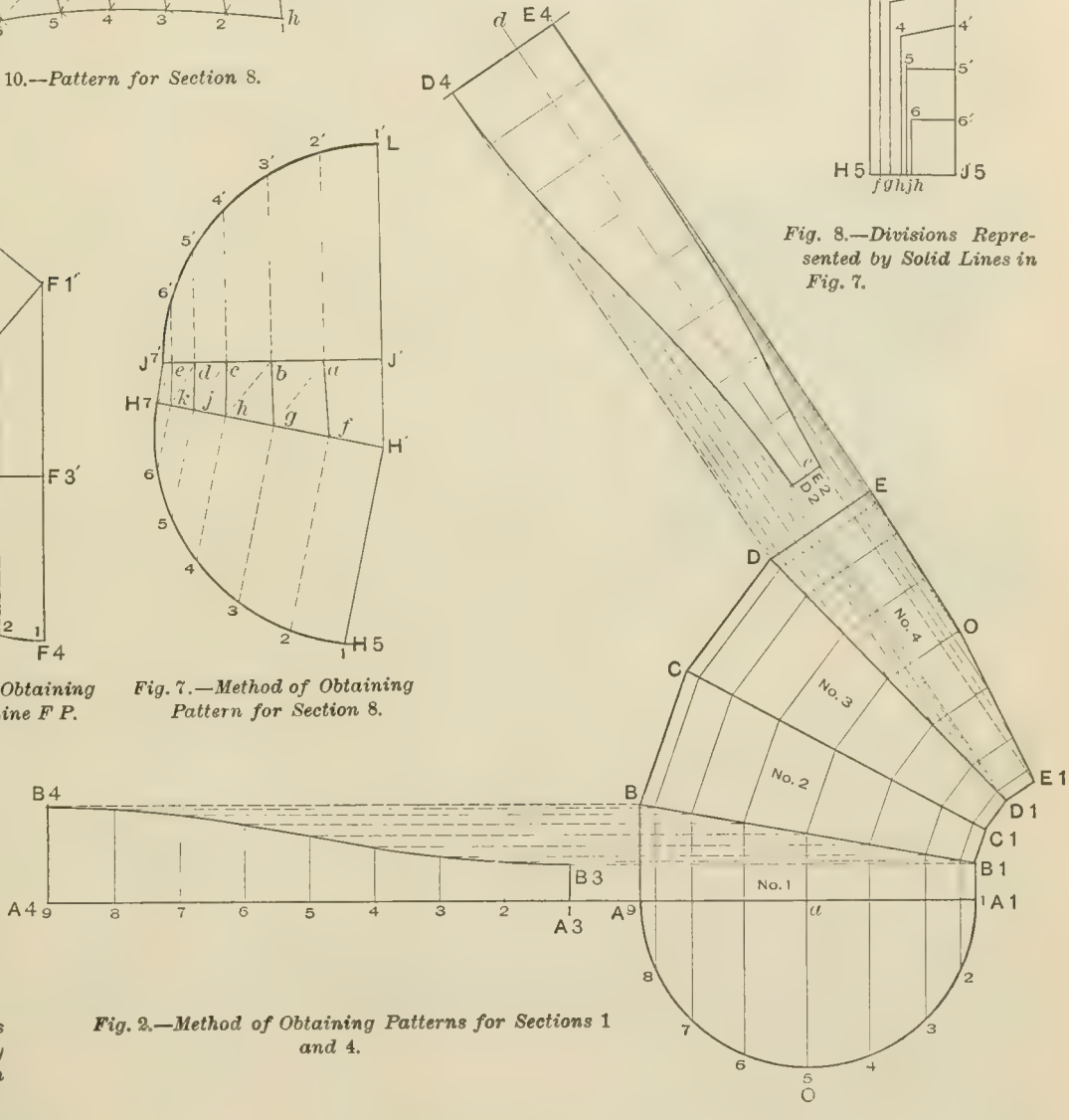


Fig. 2.—*Method of Obtaining Patterns for Sections* 1 *and* 4.

PATTERNS FOR DOUBLE ELBOW TO CONNECT TWO BOILERS.

Then lines traced through these points, as shown by E2 E4 and D2 D4, will be the pattern of section 4. The patterns for sections 2 and 3 can be obtained in a similar manner or by duplication.

To obtain the hight of sections on line F1 J1 of elevation, Fig. 1, proceed as follows: On any line, as F2 J2 in Fig. 3, starting from F2, set off the distances F1, G1, H1 and J1 of elevation, and from the points thus obtained erect perpendiculars, as shown. On F2 F3 set off the distance A R of profile of small end. In a similar manner set off on J2 J3 the distance K K1 of pro- H3′ as center, and H2 H3 of Fig 3 as radius, strike the quadrant H2′ H4. Divide H2′ H4 into any convenient number of equal parts, and, with the T-square placed parallel with H3′ H4, carry lines through H2′ H3′, extending them indefinitely. With H H1 of Fig. 1 as radius, and H2′ of Fig. 4 as center, strike a small arc, cutting H4 H3′ at H1′, and draw H2′ H1′. With the T square at right angles to H2′ H1′, and brought against the several points in same, draw lines through said points, as indicated by the figures 1, 2, 3, &c. By means of the dividers take the In this figure the distance G2′ G3′ is derived from G2 G3 of Fig. 3, and the distance G2′ G1′ is derived from G G1 of elevation. In Fig. 6, the shape on miter line F P of elevation is shown by F2′ F4′. In this figure the distance F2′ F3′ is derived from F2 F3 of Fig. 3, and the distance F1′ F2′ from F P of elevation. To avoid a confusion of lines, a duplicate of section 8 of elevation is shown in Fig. 7, and K L K1 of Fig. 1 has been transferred to J J′ of Fig. 7, as has H2′ H4′ H1′ of Fig. 4 to H H′. Then J L J′ of Fig. 7 represents the shape on J J1 of elevation, as H H′ H5

does on H H1 of elevation. To obtain the base lines of divisions for obtaining the pattern of section 8, as shown in Fig. 7 by J J′ H′ H, draw lines from the points in J J′ to similar points in H H′. Thus connect *a f*, *b g*, *c h*, &c., as shown. In a similar manner connect the points in J J′ with those in H H′, as shown by the dotted lines J′ *f*, *a g*, *b h*, &c.

In Fig. 8 is shown a diagram of divisions giving the distances from points in J J′ to corresponding points in H H′ as if measured on the finished article. To construct the diagram of divisions, draw the right angle H5 J5 L5, and on J5 L5, measuring from J5, set off the length of lines in J L J′. In a similar manner, measuring from J5, set off on J5 H5 the length of the solid lines in J J′ H′ H. From the points in J5 H5 erect perpendiculars equal to the length of corresponding lines on H H′ H5. Connect the points thus obtained with points of similar number in J5 L5, thus connecting 1 1′, 2 2′, 3 3′ &c. In Fig. 9 is shown a similar diagram of the cross sections, as indicated by the dotted lines in Fig. 7. To construct this diagram, draw the right angle H6 J6 L6, and on

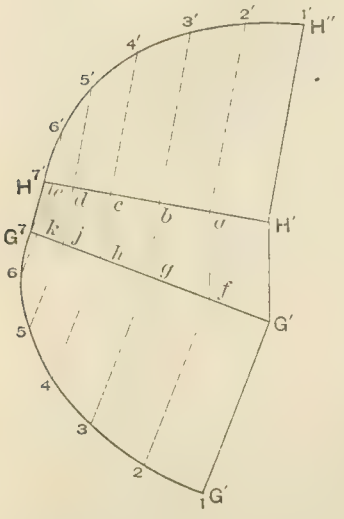


Fig. 11.—Method of Obtaining Pattern for Section 7.

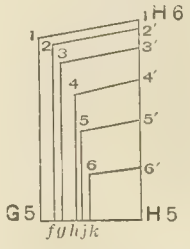


Fig. 12. — Divisions Represented by Solid Lines in Fig. 11.

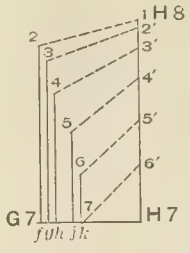


Fig. 13. — Divisions Represented by Dotted Lines in Fig. 11.

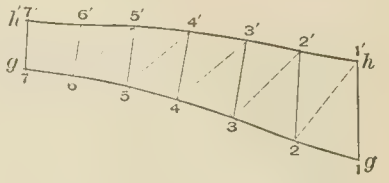


Fig. 14.—Pattern for Section 7.

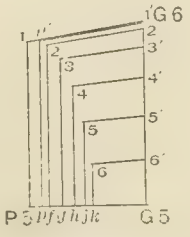


Fig. 16. — Divisions Represented by Solid Lines in Fig. 15.

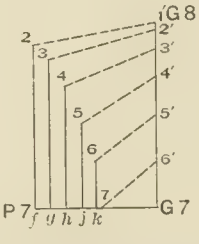


Fig. 17. — Divisions Represented by Dotted Lines in Fig. 15.

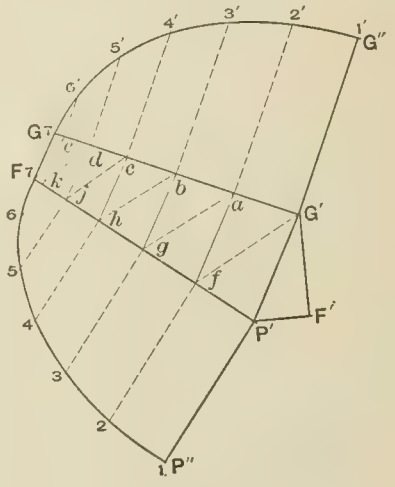


Fig. 15.—Method of Obtaining Pattern for Section 6.

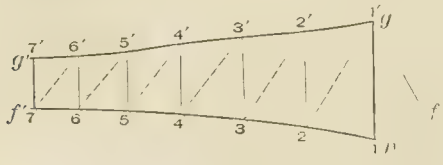


Fig. 18.—Pattern for Section 6.

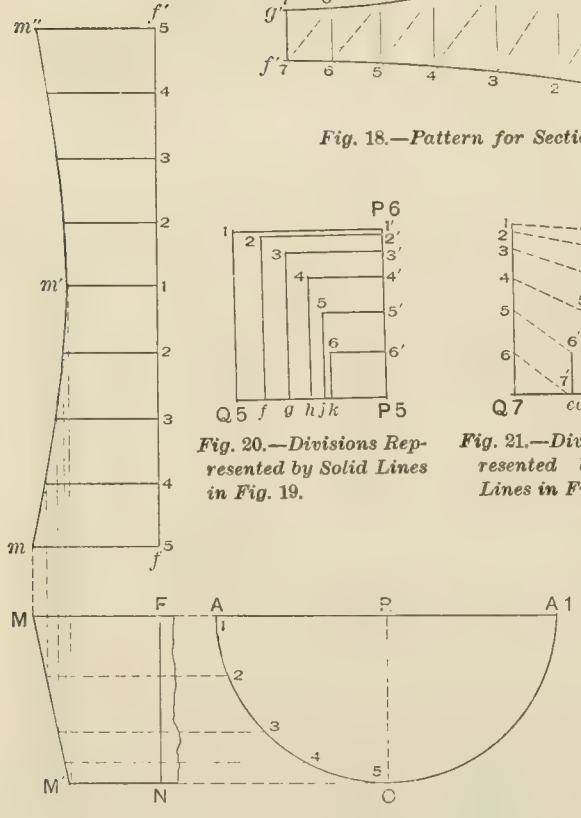


Fig. 20.—Divisions Represented by Solid Lines in Fig. 19.

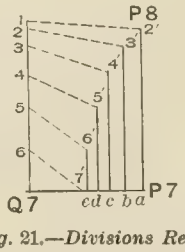


Fig. 21.—Divisions Represented by Dotted Lines in Fig. 19.

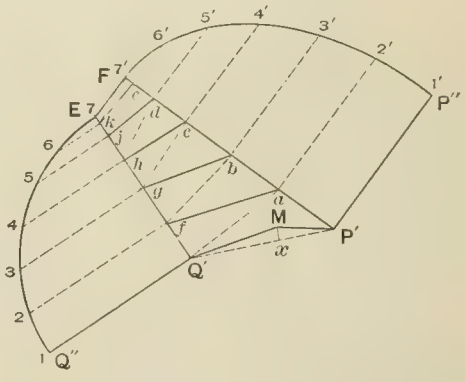


Fig. 19.—Method of Obtaining Pattern for Section 5.

Fig. 23.—Method of Obtaining Pattern for Section 10.

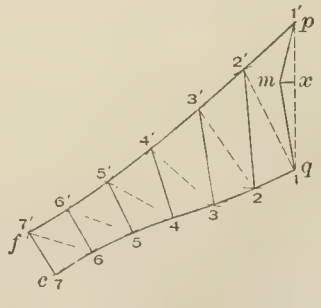


Fig. 22.—Pattern for Section 5.

PATTERNS FOR DOUBLE ELBOW TO CONNECT TWO BOILERS.

J6 L6 set off the length of lines in J J′ L, and on J5 H5 the length of dotted lines in J J′ H′ H, and from these points erect perpendiculars having the length of corresponding lines in H H′ H5, and connect the points as shown by the dotted lines in diagram.

The pattern for section 8 is shown in Fig. 10, and to describe the same, proceed as follows: On the line *h j* set off the distance 1 1′ of Fig. 8. With point 1 of pattern as center, and 1 2 of Fig. 7 as radius, strike a small arc, which intersect with one struck from point 1′ of pattern as center, and 1′ 2 of Fig. 9 as radius, thus establishing point 2 of pattern. With point 2 of pattern as center, and 2′ 2 of Fig. 8 as radius, strike a small arc, which cut with one struck from point 1′ of pattern as center, and 1′ 2′ of Fig. 7 as radius, thus establishing point 2′ of pattern. With point 2 of pattern as center, and 2 3 of Fig. 7 as radius, describe a small arc, which intersect with one struck from point 2′ of pattern as center, and 3 2′ of Fig. 9 as radius, thus establishing point 3 of pattern. With point 3 of pattern as center, and 3 3′ of Fig. 8 as radius, strike a small arc, which intersect with one struck from point 2′ of pattern as center and 2′ 3′ of Fig. 7 as radius, thus establishing point 3′ of pattern. Proceed in this manner until the various points in *j j′ h h′* of pattern are established, when lines drawn through the various points, as shown, will be the required pattern.

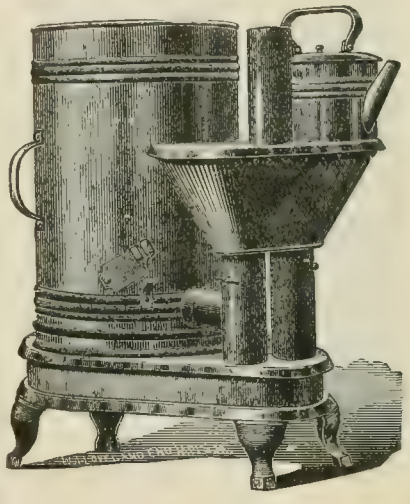
A similar method is followed in obtaining the pattern for section 7, as shown in Figs. 11, 12, 13 and 14. On H H′ of Fig 11 is drawn the shape H2′ H4′ H1′ of Fig. 4, which gives the shape on miter line H H1 of elevation. Also on G G′ of Fig. 11 is drawn the shape of G2′ G4′ G1′ of Fig. 5, which gives the shape on miter line G G1 of elevation. In Fig. 12 are shown the divisions represented by solid lines, and in Fig. 13 the divisions represented by dotted lines, derived from corresponding lines in Fig. 11. The method used for obtaining the pattern is the same as previously described. A similar method is followed in obtaining the pattern for section 6, as shown in Figs. 15, 16, 17 and 18. On G G′ of Fig. 15 is drawn the shape G2′ G4′ G1′ of Fig. 5, which gives the shape on miter line G G1 of elevation. Also on F P′ of Fig. 15 is drawn the shape of F2′ F4′ F1′ of Fig. 6, which gives the shape on miter line F F1 of elevation. In Fig. 16 are shown the divisions represented by solid lines and in Fig. 17 the divisions represented by dotted lines, derived from corresponding lines in Fig. 15. The method used for describing the pattern is the same as for section 8. To obtain the shape of *g f p* of pattern, corresponding to G1 F1 P of elevation, proceed as follows: From G5 in Fig. 16, distance G1 F1 of elevation, and from the point *p* thus obtained erect a perpendicular in length equal to P5 1 of Fig. 15, as shown by *p p*,′ and connect *p*′ G6. With point *g* of pattern as center, and G6 *p* of Fig. 16 as radius, strike a small arc, which intersect with one struck from point *p* of pattern as center, and P F1 of elevation as radius, thus establishing the point *f* of pattern; then connect *p f g*. A similar method is followed in obtaining the pattern for section 5, as shown in Figs. 19, 20, 21 and 22. On F P′ of Fig. 19 is drawn the shape of F2′ F4′ F1′ of Fig. 6, which gives the shape on miter line F P of elevation. On E Q′ of Fig. 19 is drawn the shape of F2′ F4 F3′, which gives the shape on miter line E Q of elevation. In Fig. 20 are shown the divisions represented by solid lines, and in Fig. 21 the divisions represented by dotted lines, derived from corresponding lines in Fig. 19. The method used for obtaining the pattern, Fig. 22, is the same as previously described. In Fig. 20 Q5 P5 is made equal to Q P of elevation, and *q p* of pattern is the same as Q5 P5 or 1 P6 of Fig. 20. To obtain the point *m* of pattern, from *q* on *q p* set off the distance Q *x* of elevation, and from the point *x* erect a perpendicular in length equal to M *x* of elevation. Then connect *q m*, *m p*, as shown.

In Fig. 23 is shown the method of obtaining the pattern of section 10. The profile A O A1 is similar to the profile of the small end in the elevation, being designated by similar letters. Divide the profile A O A1 in the usual manner into any convenient number of equal parts, and from the points thus obtained carry lines parallel with A A1, cutting M M′. Prolong the line N F″ and upon it place a stretchout from the profile A O A1, perpendicular to which draw measuring lines in the usual manner. With the T-square placed parallel to F″ N, and brought successively against points in M M′, cut the measuring lines of corresponding numbers. Then a line traced through the points of intersection thus obtained will be the half pattern sought, all as shown by *m m′ m″ f′ f*. The pattern for section 11 is obtained in a similar manner, or as shown in Fig. 2 for section 4.

A Straw Consuming Stove.

The De Smet Stove Company of De Smet, S. D., are manufacturing a stove peculiarly adapted to localities without timber or coal. It is designed to burn straw, hay, cobs or any other light material, and is meeting with a ready sale. An illustration of this novel stove is given herewith. It is constructed partly of cast iron and partly of sheet steel. The drum and the connecting pipes and the band between the two base castings are made of sheet steel, and the other portions of cast iron. As shown in the cut, the "cooker," which has two holes, is in front, but the stove is now made so that the two short pipes below are dispensed with and the cooker rests on and connects with the base. A partition runs from the back of the base of the stove to within a few inches of the front, and there are two dampers in the cooker, so that all the heat can be thrown to one of the pot holes or it can be compelled to go into the base, pass around the partition and come up the other hole, making a complete base heater.

The fuel is fed to the stove by a peculiar method. The large drum, shown in the rear of the stove, contains the fuel. The drum is lifted off for the purpose of refilling. On the lower part of the drum is a cover, which is removed when the drum is taken off for refilling, or to empty the ashes. Handles are conveniently arranged for lifting the drum on and off. Different thicknesses of sheet steel are used in the drum, the heavier parts being used where the heat of the fire is the most intense. The manufacturers state that two drums are desirable for regular service, as thus one drum can always be kept filled ready to replace the other when it burns out. They also state that



Straw Consuming Stove.

a drum well filled will last from five to seven hours, depending on the draft given to the fire. There are three draft holes in the lower part of the drum, one of which is shown in the cut.

The oven designed for this stove is of such a form that it can be placed over the cooking holes and attached to the stove pipe. An inner drum in the oven causes the blaze and heat to pass round it, imparting an even heat on all sides. Four different styles of this stove are made, including a single base which has no base heater, the legs being attached to the upper casting without cooker or oven. They are referred to as "the poor man's friend," because with the aid of his straw pile he can secure the comforts of a good fire as well as if he were able to obtain coal or wood.

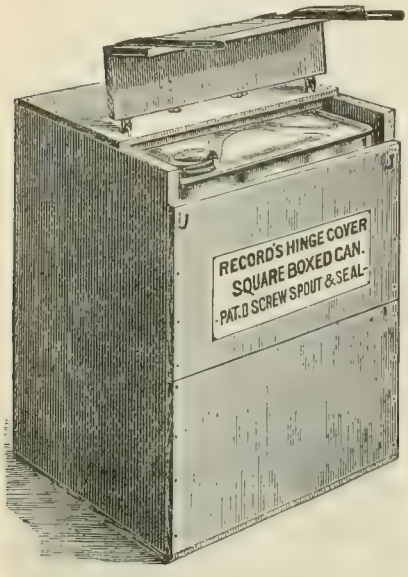
The company purchase their castings, but do all the other work of making the stoves in their own shop. The design originated in De Smet. The De Smet Stove Company are a corporation with a capital stock of $25,000. The president is I. J. Miller; vice-president, J. D. Peirson; secretary and treasurer, J. T. Cooley.

The British Board of Trade returns for November show a reduction in foreign trade from that of October. The imports for November amounted to $171,844,109, and the exports to $84,736,043. A considerable decrease in the receipts of American wheat was one of the unfavorable features of the month. American cotton showed, however, a slight increase over October.

THE RETAIL STORE.

Record Hinge Cover Square Boxed Can.

We show in the accompanying illustration a new 5-gallon hinge cover can with Record's screw spout and seal, which is being put on the market by the Record Mfg. Company, Conneaut, Ohio. The screw on the can is 1¾



Record Hinge Cover Square Boxed Can.

inches, with a vented spout on the cap, which is lined with a gasket. The firm also furnish with this their patent seal. When the can is filled for shipment the seal with the rubber gasket, it is said, completely locks the screw, so that the contents are secure. When it arrives at its destination the seal is taken out, and the can being provided with a vented spout screw, the contents may be easily poured out.

A Cut Nail Pencil.

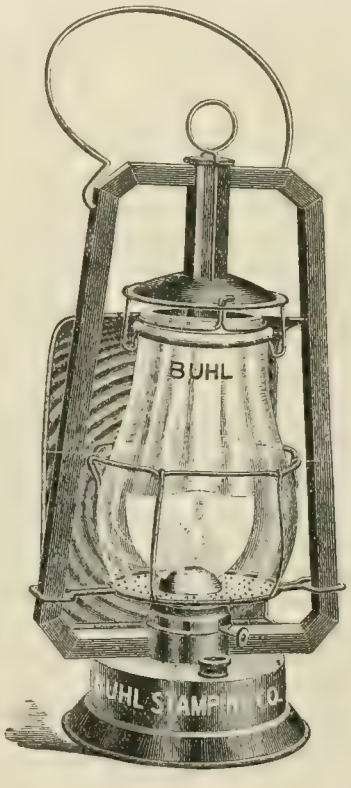
Cross Pen Company, 168 Devonshire street, Boston, have just brought out a regular propelling lead pencil, as shown in the accompanying cut. This is made in exact imitation of a 10d cut nail, and is designed for pocket use. The company are known to the trade as manufacturers of nickel pencils made in imitation of wire nails, stove and carriage bolts, screws, &c. The point is made that the cut nail pencil is especially adapted for advertising purposes, as

A Cut Nail Pencil.

the sides, being flat, admit of stamping in good sized plain letters any name, business or address. The manufacturers are prepared to make quotations on this novelty for advertising purposes for the new year.

Buhl Dash Lantern.

The accompanying cut of a dash lantern represents one of the six pieces contained in the Mascot assortment of the Buhl Stamping Company, Detroit, Mich. These goods are furnished in colored hard enamel finish. It is remarked that the lanterns contain the latest improvements, never leak, give a steady bright light and never go out in the wind. The Brilliant assortment put up by the company contains one dozen square lift tubular lanterns, assorted red, blue, russet and maroon colors. The assortments are referred to as being especially adapted to the wants of small customers and hardware jobbers during such a year of business depression as the present.



Buhl Dash Lantern.

Hayes' Safety Kettle Bottom.

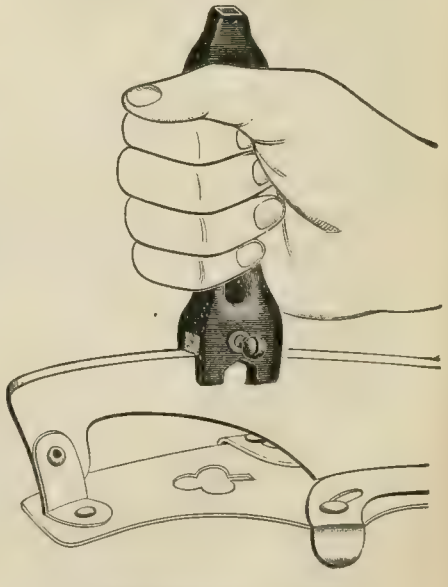
The safety kettle bottom shown herewith is offered by the Diamond Hardware Company, 620 Atlantic avenue, Boston, Mass. It is made of steel, so as to give it requisite strength, and is principally designed to be placed inside a kettle, to prevent meat, vegetables and other articles of food sticking or burning on the kettle bottom while being boiled. It is explained that the bottom may be put to many other uses, as follows: Turning it bottom side up in the kettle, it makes a good and convenient steamer; it may be used bottom side up on the top of the stove to keep hot tea, coffee or anything that it is not desirable to place on the bare stove; it

Hayes' Safety Kettle Bottom.

may be placed in the same position on the table for a sad iron holder; if pies are not sufficiently baked on the bottom the baking may be completed by putting them in the kettle bottom on the top of the stove; it may be used for broiling meat or toasting bread by removing a stove lid and setting the bottom in the kettle hole, and in the same position a tea or coffee pot may be set in it to boil quickly.

Boys' Lightning Skate Sharpener.

The cut herewith given represents the Boys' Lightning skate sharpener, put on the market by the Sandwich Novelty Company, Sandwich, Ill. The sharpener has in combination a skate key and wrench, all made of malleable iron, and



Boys' Lightning Skate Sharpener.

referred to as light, strong and durable. It is remarked that the files are of the best hardened steel, that they are square, with four sides available for use, thus lasting a long time, and that when worn out they can be replaced at slight expense. The manufacturers claim that with the sharpener a boy can put the dullest pair of skates in fine shape in from 3 to 5 minutes.

The Breck Sap Spout and Cover.

Joseph Breck & Sons, Boston, Mass., are placing on the market the sap spout and cover herewith shown. The spout, Fig. 1, is of galvanized malleable iron, to make it indestructible, and is inserted in the ¼-inch hole V, as in Fig. 2, bored 1 inch into the tree. The point of the blade D is driven slightly into the body of the tree at the back of the hole V. The reduced portion M, of the spout body enters that portion of the hole V surrounded by the bark Z of the tree and forms a bearing for the spout. It is explained that by this means the grain of the wood is in no manner compressed by the spout when inserted in the spout hole, as the only bearing of the spout in the tree is the point at the back of the hole and the reduced body portion in the bark. The manufacturers remark that the sap lies within an inch of the bark, and that upon this principle the spout is made. In Fig. 3 the cover is represented by H, and consists of a thin metallic sheet, provided with holes for receiving the spout eyes *h*. The edge of the cover is inserted under the undercut shoulder T on the spout, the eyes *h* projecting through the opening in the cover. The cover is designed to prevent rain, snow, sun and falling particles from entering the bucket and discoloring the sap collected. As the cover is attached directly to the spout, it interferes in no way with removing the bucket. It is stated that all sap spouts will freeze during a cold snap, but that the reflection of the sun on the tin cover will produce heat enough to thaw the spout from one to two hours earlier than others. In connection with the cover, in Fig. 3, is the pin No. 15 for attaching the cover to the spout, and carrying an indicator, X; this is designed to show, as far as it can be seen, that the bucket has been emptied, or *vice versa*. As each bucket is emptied and replaced on the hook, the indicator is to be turned up to show that the tree has been visited. At the next gathering the indicators are turned down. The point is made that often the same tree is visited two or three times unnecessarily after the sap has been gathered, and that the indicators prevent this loss of time; also that all the trees must be attended to, as any omission will be shown by the position of the indicator. The spouts and covers can be obtained separately if desired, also special bits by which all holes will be bored the exact depth. The manufacturers call attention to the fact that their spouts will not break in driving, and that the buckets will not twist the hooks off under the strain of high winds.

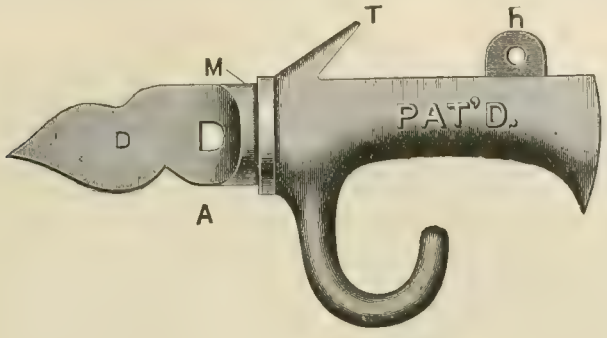


Fig. 1.—The Breck Sap Spout.

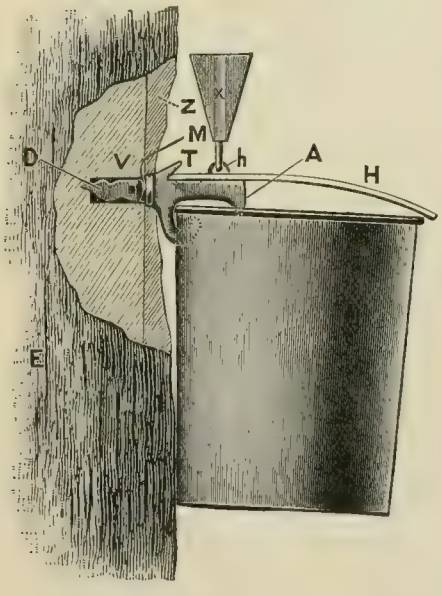


Fig. 2.—Sap Spout, Indicator, Bucket and Cover.

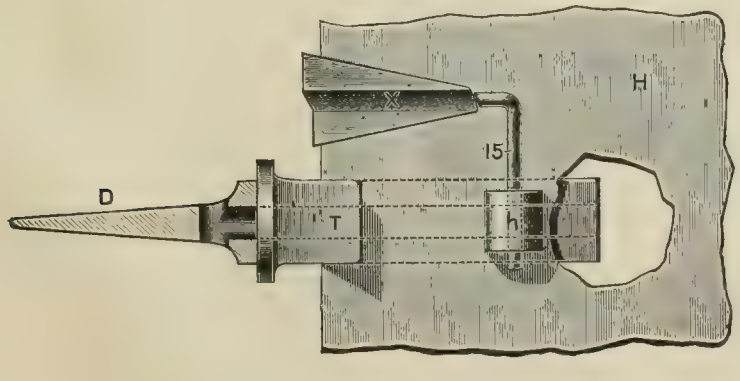


Fig. 3.—Cover and Indicator.

Value of Sanitary Work.

As illustrating the value of sanitary work, the following extract from a report recently made by Colonel C. P. Goodyear to Governor Northen, of Georgia, on the results of the Florida Sanitary Inspection law of the State, are highly interesting. The colonel writes: "I think it is demonstrable that in the short period of five years of the operation of this Florida law it has saved portions of that State three times from epidemics which, but for its provisions and prohibitions, would have been widespread and disastrous. The epidemics of yellow fever at Brunswick and Savannah in 1876 were conservatively estimated to have cost those cities not less than $3,000,000, and to have cost the entire State, including those cities, not less than $10,000,000. The epidemic at Fernandina in 1877 was estimated to have cost that city directly nearly $1,000,000, and the State of Florida over $2,000,000. Various estimates of loss to the State of Florida by the widespread epidemic of 1888 range from $7,000,000 to $15,000,000. The epidemic which commenced at New Orleans and took in nearly the entire Mississippi region, with its tributaries, in 1878, was estimated by the most conservative estimates to have cost the territory involved not less than $200,000,000, an amount equal to the losses by the great Chicago fire, and none of the losses referred to above, except the loss of life, can be insured against by any known system of insurance. We pass laws for the education of our children and make liberal appropriations to enforce their provisions, and decline to legislate against the evils which are preventable in their nature and which result in epidemic, killing the children by hundreds and thousands, after we have educated them."

The attention of ingenious men and women is directed to the fact that the Franklin Institute, Philadelphia, Pa., are interested in the grant of certain medals for discoveries and inventions. The Elliot Cresson Gold Medal, founded in 1848, may be granted for some discovery in the arts and sciences, or for the invention or improvement of some useful machine, or for some new process or combination of materials in manufactures, or for ingenuity, skill or perfection in workmanship. The John Scott Legacy Premium and Medal, which is $20 and a bronze medal, is awarded by the city of Philadelphia on the recommendation of the Franklin Institute for useful invention. The Edward Longstreth Silver Medal is awarded for useful invention, important discovery and meritorious work in or contributions to the sciences or the industrial arts. Full directions as to the manner and form in which applications for an investigation of inventions and discoveries will be sent by addressing William H. Wahl, secretary of the Franklin Institute, Philadelphia, Pa.

The death of Sidney Shepard of Sidney Shepard & Co., Buffalo, N. Y., is reported. We defer ntil a later issue reference to his business career, and the prominent position he has long occupied in the lines with which he has been actively identified.

While boring a well on the property of a Cold Storage Company in the city of Montreal, a few days ago, natural gas was struck at a depth of 1020 feet. This discovery, it is believed, may lead to important results.

STOVE TRADE NOTES.

Experiments with Gas Stoves.

(*Continued from page* 45, *December* 23, 1893.)

RELATIVE HEAT VALUE OF COAL AND GAS.

We may now discuss the character and composition of coal gas, and it would be instructive to compare it with the composition of the coal from which it is obtained. We shall thus gain considerable information bearing on the comparative calorific value of these fuels. Coal gas drawn from the supply pipes in the *Lancet* laboratory (Gas Light & Coke Company's supply) has the following percentage composition according to our analysis:

	By volume.	By weight.
Benzine (C_6H_6)	0.55	3 98
Olefines (C_2H_4)	4.45	11.76
Carbon monoxide (CO)	7.80	20.00
Hydrogen (H)	52.90	9 84
Methane (CH_4)	31 80	48.00
Nitrogen (N)	2.50	6.42

An average sample of coal gives the following figures:

	Per cent.
Carbon (C)	82.12
Hydrogen (H)	5.31
Nitrogen (N)	1.35
Sulphur (S)	1.24
Oxygen (O)	5.69
Ash	4.29

It will at once be seen that, whereas in coal the carbon is the chief constituent, in coal gas it is replaced largely by hydrogen, the carbon being left behind in the retort as coke Hydrogen, methane and carbon monoxide are the chief constituents of calorific value in coal gas. Methane is closely related to hydrogen and is characterized by similar properties. While the calorific value of carbon is 8080 units, that of hydrogen is 34,500 units, or more than four times as great. There is, therefore, a distinct calorific gain in this respect; but to make a fair contrast between the calorific value of gas and coal we must compare the thermal value of a given quantity of coal with the gas yielded by that quantity. For that purpose we cannot do better than place side by side the heat value of a ton of coal and the heat value of 10,000 cubic feet of gas, which is the average amount a ton yields. It is as well to explain first that the heat unit is taken to be the amount in grams of water raised 1° C. by 1 gram of the substance. On this basis the thermal values of 1 ton of coal and the gas it is capable of producing, both of the composition indicated above, are as follows:

	Heat units.
Coal, 1 ton	= 8,353,846,640
Gas, 10,000 cubic feet	= 1,635,000,000

The gas produced, therefore, represents approximately one-fifth of the calculated heat value of the ton of coal from which it is derived, so that if the ton of coal be worth 25 shillings, the gas, as regards the heat value, will be worth 5 shillings. or 6 pence per 1000 feet. The difference represents the energy of the residual coke, the tar and the heat spent in converting part of the coal into gas. The calculation is valuable in indicating one thing—namely, that the calorific value of coal gas is a fifth of coal, or equal to 400 hundredweight of the coal from which it is obtained, supposing that the total energy of the coal is made available; but this is too strong a supposition. Coal is far from completely burnt in probably 999 out of 1000 fires; a large proportion of its heat value is lost in the shape of incomplete products, inflammable gases, soot, and so on; on the other hand, gas admits of complete combustion under easy circumstances, and its total calorific value is therefore utilized. In other words, while gas does its duty fully, coal, as commonly consumed, fails largely in this respect. Here is an important point, and one on which the whole question in relation to its bearing on the fog difficulty rests. In burning coal in the ordinary way we not only lose a notable proportion of fuel, and thereby heat, in the shape of tarry products, soot and unoxidized gases, but in so doing the air is charged with just those bodies which give to the particles of moisture in ordinary mist the detestable and injurious character of the notoriously pea soup colored London fog. With gas as fuel, which in some measure represents these products, there is very small possibility of such undesirable products ever being formed, while an important economy as regards heating effect is at the same time secured.

It must be remembered that gas at the present time is ostensibly supplied for lighting purposes, and the maintenance of a definite illuminating power and a certain degree of purity contributes largely toward its expense. Gas suitable for heating purposes could be supplied doubtless at a very much cheaper rate, and then its cost as fuel compared with coal would sink into insignificance. It has been suggested, indeed, that if London were supplied with a non-illuminating gas, say at half the rate at present charged for illuminating gas, then there would be a clear and open way out of the difficulty as regards heat efficiency, combustion and fuel economy. In that case either a device for rendering the gas luminous at the point of burning when an ordinary burner is used by means of naphthalene or some known carbureting compound or else the universal employment of the incandescent burner would meet the requirements of such a novel installation. Gas engineers, however, express doubt as to the practicability of such a system. It would certainly have many drawbacks. In the present incandescent system, for example, the use of glass lamp chimneys constitutes a source of inconvenience and trouble, while with carbureting contrivances periodical changing and constant inspection would be inevitable. Nevertheless, the incandescent burner, with recent improvements, is rapidly growing in favor, and we feel confident that this form of burner promises to play a very important part in the future. In any case, it is certain that there is still plenty of room for improvement in the method of using gas as an illuminating agent. It is well to bear in mind, however, that if a cheaper gas were produced it would be certain to consist largely of water or producer gas, 50 per cent. of which practically consists of carbon monoxide, a deadly and an odorless gas. On the other hand, such a gas would be equally suitable for heating purposes. Again, any modification of the present system of gas producing would seriously affect, if it did not stop altogether, the yield of valuable by-products, and, as we shall show, this is a matter of considerable importance.

CONSIDERATION OF THE RESULTS.

From a knowledge of the composition of the fuel burnt we can easily ascertain what should be the composition of the products of its complete combustion. Thus, according to the analysis of coal gas given above, it contains hydrocarbons, hydrogen, and a trifling amount of sulphur and nitrogen. The products of complete oxidation of coal gas should be, therefore, chiefly steam and carbonic acid, with traces of sulphurous and sulphuric acids and nitrogen; but in the flue these products are necessarily largely diluted with atmospheric air, a current of which is induced to flow up the chimney by the heat of the fire. We should expect to find, therefore, on analysis of the gases in the chimney, carbonic acid, a large excess of nitrogen, partly derived from the air, that has yielded up its oxygen to the fuel, partly from air, introduced by convection, and partly, but to a very small extent, from the nitrogen originally present in the gas. The hydrogen, of course, turns to water, which condenses to liquid. If, on the other hand, combustion were incomplete, other products, such as carbon monoxide and hydrogen, would be found. As a matter of fact, in no single instance of a gas fire could incomplete or imperfect products of combustion be found in the gases going up the chimney. In other words, the permanent gases from the flue consisted wholly of carbonic acid, nitrogen and oxygen (*vide* Column 8).* This cannot be said of the products of combustion of coal when it is burned in an ordinary fire place. In this case we see at once from the analyses of the gases that valuable heat producing materials, in the shape of hydrocarbons, carbon monoxide and a large proportion of hydrogen and tarry compounds, escape into the chimney, eventually contaminating the air. It should be remembered also that in the fuel thus lost occur the tarry by-products already referred to, which are recovered at the gas works, yielding, when suitably treated, an abundance of valuable bodies. Hence has arisen the proposal to leave the distillation of coal (for that, after all, is really what takes place in the ordinary grate) to the gas maker, so that he may not only recover the valuable and volatile by-products and obviate waste, but also supply a fuel which, without trouble or difficulty, burns without smoke and evolves no products prejudicial to health. However perfect the combustion of coal gas may be, there is one element in it which gives rise to a product on burn-

* The table to which this and later references are made was printed in *The Metal Worker* December 23.

ing which demands serious attention. We refer to the sulphur in coal gas. Sulphur itself in burning gives sulphurous acid, but in the form in which it occurs in coal gas it burns nearly completely into sulphuric acid and not into sulphurous acid, as generally supposed, or, at any rate, the quantity of the latter compound compared with the former is very slight. This is proved in the above experiments, but the following simple test may be quoted as conclusive. When water is boiled in a glass flask over a Bunsen burner a strongly acid liquid may be washed off the bottom of the flask after some time, which will be found to char paper and to give all the reaction of sulphuric acid. Doubtless this in some measure accounts for the destructive action of gas in burning on the various articles (brass work, ceiling, plants) of the dwelling room. In the products of combustion of coal gas, then, there occur sulphuric acid and probably sulphurous acid.

PURITY OF GAS.

As mentioned later, the Legislature requires the gas to be purified down to within 20 grains per 100 cubic feet, and the gas supplied by the Gas Light & Coke Company is reduced to 12 grains below this limit—that is to say, to 8 grains. Satisfactory as this is, it would be better if the sulphur could be completely removed in view of the effect of its combustion products on vegetation, and probably, therefore, on animal life; but no known purifying process can reduce the sulphur to less than 8 grains per 100 cubic feet, which is the degree of purification effected in actual practice. We dwell, and lay some emphasis, on this subject because the experiments of Prof. Thistleton Dyer, at Kew, have shown conclusively that the deleterious effects of fog on plants are due to the toxic influence of small proportions of sulphurous acid. Professor Oliver of the Horticultural Society also attributes the action to sulphurous acid, and in experiments he has made in which an atmosphere containing a surprisingly minute quantity of sulphurous acid was employed, the changes in the tissue of the plant were observed with the microscope to be the same as those produced by fog.* We are, therefore, led to repeat that it would be a distinct advantage if gas could be completely freed from sulphur compounds ; not that sulphurous acid or sulphuric acid conduces to fog formation—for there is no evidence that they do—but because there is reason for objection on other grounds to even small traces of sulphurous acid in the atmosphere. Let it be observed, however, that by far the greater proportion of the sulphur of coal is left behind in coke in the retorts ; nearly all the remainder, in the shape of volatile sulphur compounds, is eliminated in the processes of purification. The use of gas fuel would therefore minimize the evolution of sulphur compounds in the air. Moreover, when the combustion of coal is imperfect, the poisonous gas sulphureted hydrogen (H_2S) is produced. On the other hand, if, as is rarely the case, it is complete, then practically the whole of the sulphur would be given off in the form of sulphuorous and sulphuric acids (SO_2 and SO_3). In the next place, the results furnished on an analysis of the gases drawn from the glowing fuel (Column 7) are of special importance, since not only is a knowledge gained of the steps in the combustion process, but the revealed composition of these gases accounts in a very interesting manner for certain deleterious effects which are known to be produced by some gas stoves under certain conditions of working, in which case, be it remarked, it generally happens that the defect is due to a want of application of common intelligence as to the requirements of a fire, be it coal or gas.

* London Hygienic Congress, August, 1891.

COAL GAS.

Referring once more to the composition of coal gas, we find that the fuel constituents consist practically of hydrogen, methane and carbon monoxide and that when the coal gas is admitted, into the atmospheric burner it is mixed with air in the majority of cases in the proportion of 1 volume of gas to 2.3 volumes of air. Now, 1 volume of gas for complete combustion requires 8½ volumes of air, so that the air admitted with the gas into the burner is quite inadequate to effect complete combustion. The chief combustion constituents of the gases from the center of the glowing fuel prove to be hydrogen and carbon monoxide, the latter often in greater proportion (10 per cent.) than it is ever found in the gas itself before burning. This may be due to one of two things: either that the saturated hydrocarbons and the greater part of the hydrogen burning first naturally raise the proportion of carbon monoxide, or that carbon monoxide is formed from incomplete combustion of the hydrocarbons. Whichever is the explanation the fact remains that the gas which is present in the fuel contains traces of unsaturated hydrocarbons and a large proportion of carbon monoxide. From a hygienic point of view this is of the utmost concern, since if the working conditions of the stove are disturbed—as, for example, by a down draft—it is extremely probable that among other products the deadly gas carbon monoxide would find its way into the room. Unfortunately, the presence of this poisonous gas in the air is not evident to the nose or eyes, as the objectionable gas acetylene or the smoke of a faulty fire would be; but as it is usually accompanied by other products which possess a characteristic smell its presence may usually be detected without difficulty. That carbon monoxide is the last gas to burn is also evident from the lambent blue appearance of the flames above the clay fuel; but we imagine that no one would ever be likely to say that a gas stove would burn satisfactorily in the same setting where a coal fire has produced unpleasant results. In view of the large amount of ignorance exhibited on this point we must strongly insist, and it may be taken as an axiom, that if a gas fire is expected to give satisfactory and especially salutary results it should have precisely the same provisions made for its favorable working as are required for the satisfactory working of a coal fire. It is, further, a popular and a serious mistake to suppose that a gas fire will remedy a faulty chimney, but a drafty chimney may in most cases be remedied by reducing its capacity by means of an iron pipe, which affords ample outlet for the products of a gas stove. For the purpose of the present experiment the flue of the gas fires conveyed the products of combustion directly into an ordinary chimney. The fires were thus working under conditions which it is absolutely essential should be observed, and accordingly most minute tests failed to find any deleterious products in the air of the room, in spite of the fact that no special precautions were taken to insure ventilation. As an example of the kind of testing performed in this direction blood itself was taken for the purpose, through which the air of the room was aspirated during the whole time the experiment lasted. In no instance was carboxyhæmoglobin (COHb) detected, while it was rarely detected even in the flue gases, but invariably in the gases drawn from the fuel. The risk of contaminating the atmosphere with carbon monoxide is minimized when the stove is worked at low pressure; the flames being shorter, they are not impeded or spread out by the fuel, and complete products are therefore formed before the gases leave the fuel area. It will be noticed, again, that the proportion of carbon monoxide is considerably reduced in those stoves where asbestos fiber or iron trellis is used as the heating agent. The interference or choking of the flame by the fuel being closely packed upon the burner would appear, therefore, to have some share in preventing the burning of carbon monoxide. As has already been stated, however, complete products of combustion were invariably found in the chimney.

BURNERS.

The stoves examined were all fitted with the Bunsen or atmospheric burner. These were selected for investigation because the Bunsen burner gives greater heat and the products of combustion are more satisfactory. Moreover, Bunsen burners can only be used for heating fuel, since luminous flames deposit carbon. Luminous flames, therefore, are only applicable to stoves without fuel, and consequently to those patterns which, when working, present the appearance of an ordinary coal fire. In the Bunsen or atmospheric burner the gas merges from a central nozzle, and passing unburnt up the burner tube, draws air with it by injection action through an opening provided near the inlet. The mixture of air and gas, which, according to our experiments, varies from 63 per cent. of air with 37 per cent. of gas to 71 per cent. of air with 29 per cent. of gas, can be lighted at the top of the tube, where it burns with a faint blue perfectly smokeless flame. It may be assumed that the air so introduced enables the carbon which is concerned in rendering the flame luminous to burn at once. Comparatively recent observations have shown, however, that this explanation is incomplete, if not incorrect, for if instead of mixing the air with the gas inert gases, such as nitrogen or carbonic acid, be employed the flame similarly becomes non-luminous. Prof. Vivian Lewis, who has devoted a great deal of attention to the subject of flame, maintains that luminosity is due to the formation at from 1000° C. to 1200° C. of acetylene from the original hydrocarbons, but that the moment the temperature is reached by the combustion of the hydrogen and carbon monoxide the acetylene formed decomposes, with a further rise of the temperature, and the carbon heated to incandescence radiates heat and light. On this theory the following is the probable explanation of the chemistry of the non luminous or Bunsen flame: The nitrogen of the air acts in the normal Bunsen flame by so diluting and protecting the hydrocarbons that a far higher temperature is needed for their decomposition, and this action gives time for the oxygen of the air with formation of acetylene or the liberation of carbon, and hence without luminosity. The cooling of the air introduced, which is able to add to the

general result, leads to loss of luminosity, although the cooling is less than the increase in temperature brought about by the oxidation due to the oxygen in the air. There are two drawbacks to atmospheric burners: 1, the non-luminous flame may exhibit a tendency to "light back"—that is, to run down the burner tube to the supply nozzle; and, 2, the phenomenon of injection in the Bunsen burner, by which the air is mixed with the gas, gives rise to a roaring noise resembling the escape of gas from a pipe. "Lighting back," or the ignition of the gas in the burner tube till it reaches the small gas nozzle inside the air mixing chamber, may be caused by a down draft acting against the upward pressure of the mixed gas, or more commonly it results from too small a nozzle or choking of the nozzle, or else insufficient gas pressure to effect the complete injecting action. The defect of lighting back is a serious one and has created considerable prejudice against this system of gas firing from the fact that when a burner lights back incomplete combustion is the result, offensive acetylene is produced, and the fuel is blackened with soot. It can only be obviated by strict attention on the part of the maker to the proper adjustment of the burner and on the part of the consumer to the regulation of the gas supply by allowing sufficient pressure to act upon the burner and by occasional cleaning of the burner. Lighting back frequently happens when the burners are first lighted, arising from the admixture of the gas with an excess of air present in the supply pipe or in the burner. Before lighting, therefore, it is best to allow a small quantity of gas to escape. Governors or regulators fitted to each burner if there are separate taps obviate the necessity of regulating the main pressure, and give perhaps the most satisfactory results, although we have noticed a tendency in the flames of burners provided with governors to become in part and gradually luminous. The second drawback, which is occasioned by the roaring noise of the injector, is a difficulty which has not been satisfactorily met. Certain attempts have been made to produce a noiseless burner, but there is still room for considerable improvement in this direction.

REGULATION OF THE HEAT.

Stoves fitted with one atmospheric burner, in which the flame is distributed through several holes, offer some inconveniences which we have not failed to notice. When the gas is full on they burn satisfactorily enough, but if it is desired to moderate the temperature of the room, and if the flames are accordingly turned down, they become very unstable and are likely to light back unless the supply of gas is kept above a certain limit; this limit in the type of stove referred to is a supply equal to 0.4 inch pressure, averaging a consumption of 20 feet of gas per hour. It therefore follows that when the room is sufficiently heated, and especially a small room, it is difficult to keep the temperature at, say, from 60° to 65° F.; but with separate burners, each being provided with a tap, it may be regulated with exactness by reducing the number of burners to three, or even to one.

FUEL.

The best fuel for gas firing is undoubtedly that known as clay ball fuel or some modification of it. It gives the best heating result, has the nearest appearance to a cheery coal fire, and affords the maximum of heat in the best form—namely, radiant heat—and saves loss of heat up the chimney. In grates to which gas firing is adapted log fuel is an excellent material. It is important, however, that the fuel should be packed well, as too great an interference with the normal flow of the flame (choking of the flame) tends to the production of unburnt gases as well as the emission of combustion products into the air. Cases of this kind occurred in a few of the stoves examined. Both asbestos fiber and iron trellis are inferior to clay ball fuel, although the objection just urged does not apply unless the flames are unusually long. As shown in the table, neither form of fuel, metal or fiber, is economical in producing a degree of heat proportional to the amount of gas consumed.

STRUCTURE OF STOVES.

In view of the fact that most of the authorities on the subject of the efficient and sanitary warming of a dwelling agree that radiant heat conduces most to healthy conditions, we are bound to entertain a preference for gas stoves in which the heating effect is due to radiated heat only. Of course, in a stove constructed to maintain a constant stream of air warmed by passage over heated surfaces, generally metal, the fullest calorific effect is gained, but it is well known that air so heated loses some of its essential properties. Apart from this consideration, air scorched in this manner is apt to impart a disagreeable smell to the room, arising from the burning of dust particles. The consideration of these important points leads us to the conclusion that gas fires evolving solely radiant heat are to be held in preference to those fitted with a chamber for warming the air or in which provision is made for the warming of air by convection. An objection which may be justly raised, and one which we noticed in the course of the experiments, is that the enamel or varnish used to protect the metal of the stove gives rise to disagreeable smell and smoke when the stove is first used. This could be easily obviated, one simple course, which we believe the Gas Light & Coke Company adopt, being to put the stove through a preliminary test before sending it out. Otherwise an enamel free from this property should be used. Again, although water is by far the chief product of the combustion of gas, yet gas fires produce a drier atmosphere than coal fires, because the strong heat near the stove rapidly appropriates the moisture in the air immediately in front of the stove and carries it away up the chimney. The air is thus dried, and the presence of moisture is essential for healthy and comfortable inspiration. The temperature of the room also being more rapidly raised with gas than with coal, the capacity for moisture is greatly increased. In many cases, however, the drying effect experienced is due to an unreasonable overheating of the room, an occurrence which is more likely to take place with gas than when a coal fire is used, and the result invariably of neglect. A tray filled with water placed near the fire is stated to be a simple remedy. Summing up the evidence gained from the entire results of the investigation, we are induced to express the opinion that gas can be used for warming purposes efficiently without prejudice to health and without the formation of fog forming constituents or air contaminating products, provided that certain conditions are strictly adhered to.

SUGGESTIONS.

The following suggestions, based on an experimental review of the methods of gas firing at present in vogue, may be taken as meeting the requirements which we deem to be essential.

1. It is desirable that the stove should afford radiant heat only.
2. For this purpose some form of clay fuel is best.
3. Attention should be given to the packing of the fuel, so as to avoid undue clogging or impeding the flow of the flames.
4. The stove should be supplied with separate burners with taps.
5. Some means of controlling the supply should be adopted. Governors or regulators are indicated.
6. A simple arrangement appears to be necessary by which undue drying of the warmed air may be avoided.
7. Indestructible enamel, or enamel little affected by heat, should be used for coating the stove; common paint, varnish or ordinary enamel should be avoided.
8. An efficient flue should in all cases be provided. With gas fires, however, the flue pipe may be much smaller than the chimney required by coal fires.
9. The burner should be as far as possible noiseless.

In dismissing this important section of the subject it only remains to point out the manifold advantages of gas over coal fires—advantages, however, which are only too obvious to need description. None will deny the convenience of the system. With gas a bright, hot fire can be obtained at any moment, night or day; the heat can be regulated to a degree, the fire can be stopped at will, conveyance of coal is dispensed with, and the oftentimes troublesome and clumsy process of lighting with wood and paper is avoided, while cleanliness is an inevitable result of gas installation. At first sight it would appear that gas as fuel compares unfavorably with coal in regard to cost; but when all the factors—cleanliness, convenience, manipulative advantages—are taken into account—when the pros and cons are considered in minute detail—it is probable that, used rationally, gas runs coal very closely even on the score of expense. But one thing is certain—namely, that the universal adoption of gas as a source of heat would eventually lead to the complete abatement of the smoke laden and unhealthy fogs which are a bane and a reproach to the most important city in the world.

COOKING BY GAS.

An inquiry of the present character would be incomplete without a few observations on the use of gas for cooking purposes. In this section we have made no experiments, the main object we have had in view being to determine the practicability of using gas as a general fuel, and in showing how its substitution for solid fuel or coal would prove a means of overcoming the fog difficulty. We are, however, far from saying that the indifferent use of coal in the private kitchen or the restaurant for culinary purposes is not a serious factor in contributing toward the aggravation of fog and smoke; on the contrary, there is abundant reason for thinking that the kitchens of the restaurants and hotels of London are great offenders in this respect. We have confined our attention in this part of the inquiry simply to the inspection of some of the large kitchens of London as represented in some of our great institutions—as, for example, workhouses, hospitals, hotels, warehouses and other large establish-

ments. As in all branches of industry, so in the manufacture of gas cooking appliances, there are to be found all grades of workmanship, but we have noticed with satisfaction that the leading and well-known firms pay close attention to those *minutiæ* upon which the working success of a gas cooker largely depends. Indeed, high class work is a *sine qua non* when the construction of gas cookers is concerned. Improvements occur almost every day, but we have seen cookers by leading makers that have been in use for over ten years and still give satisfactory results.

ADVANTAGES OF GAS FOR COOKING.

The advantages accruing from the use of gas for cooking purposes are especially manifest where it is employed on a large scale; in fact, where cooking has to be done, perhaps, several times a day for 1000 persons and upward coal fires would prove to be unequal to the task. It is perfectly surprising to see in what small space a complete meal may be cooked, comprising joints, vegetables and pastry, in a few hours, for upward of 1000 employees, in, say, a retail establishment; and the cleanliness attendant on the use of gas in the kitchen settles all question both as to economy and as to efficiency. We have seen hundreds of pounds of meat roasted, large piles of potatoes baked and all kinds of pies and pastry cooked, and yet in spite of the large quantity cooked the kitchen presented the aspect of a model dairy rather than a busy culinary department, in which, when coal fires are used, dirt and grime are commonly present. Cooking by gas is economical, simply because the gas is only used when it is required and its full effect is utilized to cook the food, whereas in ordinary coal fires much of the heat is lost up the chimneys. On a large scale it may be reckoned that for every pound of meat cooked 1 cubic foot of gas is consumed; that is to say, 100 pounds, or nearly a hundredweight, of beef would require 100 feet of gas for complete cooking, which means, at the rate of 3 shillings per 1000 cubic feet, a total cost of 3½ pence. The cost would be somewhat greater in proportion for small quantities of meat. In some gas cooking stoves luminous flames are used, while others are fitted with non-luminous or atmospheric burners. It is maintained, on the one hand, that luminous burners are better adapted for roasting, while, on the other, some regard the atmospheric burner as cleaner and equally if not more efficient. In both cases the joint is exposed to the products of combustion, but as the oven is well ventilated these are immediately carried away through a flue—a provision of some importance seldom if ever made, or at least effected, in the ordinary coal fire oven. The advantages derived from the use of luminous flames are that radiant heat is largely furnished—the form of heat used when a joint is roasted in front of the fire, and that the flame is constant. On the other hand, delicate analyses have shown that every luminous flame burning freely in air gives off distinct traces of carbon monoxide, acetylene, and even inflammable gases such as hydrogen and methane. The products of the atmospheric burners, on the contrary, are more complete, but there is the drawback already alluded to of the tendency of atmospheric burners to light back or of the air holes to become choked, and very objectionable and disagreeable products then result. Periodical cleaning of the burners, however, is all the attention needed to successfully avoid this difficulty, and we have seen atmospheric burners that have been in use for several years and yet show little sign of deterioration. Stoves fitted with the atmospheric burner seem to be most in favor and in greater demand. One point in this connection is interesting to observe, and that is that meat or other food cooked by gas seldom if ever exhibits any objectionable flavor which could fairly be attributed to the gas. This arises from the fact that the cooking operation is so certain and sure that vapors are constantly being emitted from the food, which effectually ward off any odors that may happen to be in the oven, which are then rapidly carried away into the flue by the constant draft of air passing through the cooking chamber. The flavor and character of the meat or food cooked by gas leave, as experience has shown, little to be desired. Consequent on the sharp heat and a plentiful supply of air around the joint cooked, the juices of the meat are kept in while the excess of fat is eliminated. This is the reason why in cooking with gas the joint is invariably richer in gravy constituents. Moreover, the fat which collects in a pan provided underneath the cooker is cleaner—in fact, nearly white—the degree of perfection in this respect depending upon the distance the catchpan is situated from the source of heat. If it is too close the dripping is browned; but in some stoves an arrangement is made for drawing the fat away from the burners; dripping so obtained is beautifully white. Space forbids us entering into a description of the various and manifold appliances for cooking by gas and their several modifications, and we need only add that, in addition to the case of roasting, gas is equally applicable to grilling, cooking pastry, bread making, boiling, and most other culinary operations; moreover, our inspection has satisfied us that in gas cooking stoves, as in gas heating stoves, the products of combustion are complete, and that smoke or soot is never produced.

[THE END.]

ODD PLATES.

FRED G. BRAND, secretary and treasurer of the Brand Stove Company, died at his residence, 531 Galena street, Milwaukee, Wis., on the morning of Sunday, December 17. He was the only son of Sebastian Brand, president of the company, and possessed excellent executive ability, standing high in the business community. He was born in Milwaukee, on April 1, 1859. Mr. Brand had been unwell for a long time, and for the last six or eight years had been compelled to seek a warmer climate during the cold winter months. The present winter his illness took a serious turn, ending in his death.

WE HAVE RECEIVED with the compliments of Buck's Stove and Range Company, St. Louis, Mo., a very neat pocket memorandum book, giving more or less information of a general character likely to prove of interest and value to the owner. The book is in the nature of a calendar, diary and memorandum combined, being copyrighted by the Mathews-Northrup Company, of Buffalo, N. Y. The second and third pages of the covers carry yearly calendars for 1894 and 1895, while several pages are devoted to statistics showing the population in 1890 of the larger cities of the United States, and also showing the cities of the world having over 125,000 inhabitants. Each page is divided into seven spaces, there being four lines to a day, for the purposes of memoranda. In the upper outer corner of the early and closing pages is a *fac-simile* of the company's trade mark. Another feature of the little pamphlet is found in a number of pages intended for names and addresses, while others are ruled for cash account.

THE LEXINGTON FOUNDRY COMPANY of Lexington, Ky., are meeting with a very gratifying demand for their stoves fitted with Secretary J. M. Kelly's patent wrought steel oven. The demand emanates from an extensive territory, extending from the New England States to Louisiana and as far West as Utah. Samples of the stoves with the patent oven have been shipped during the past year to nearly all parts of the country, and in fact to such an extent as to necessitate the constant running of the company's foundry. We understand that the manufacturers now have more orders on hand than they can fill during the next 60 days, and that in every instance the patent oven has given entire satisfaction. The oven, it may be stated, is made out of a solid piece of steel, bolted at the grate rests and braced horizontally with beveled cast strips which, it is claimed, makes it impossible for the oven to warp or buckle. The patent covering this device was issued December 12 of the present year.

ONE of the most dainty souvenirs that has ever reached *The Metal Worker* is a beautiful wall calendar, for which our acknowledgments are due to Henry Gleason, 106 Beekman street, New York. It is entitled "A Calendar of Cronies," and is composed of 12 cards, 11 x 9 inches, with scalloped edges, bearing exquisite *fac-similes* of water color paintings of child and animal life, by Maud Humphrey. The leaves are suspended by a bow of white silk ribbon, each being devoted to one month of the year 1894. That for January alone exhibits at the bottom a neat little card in artistic lettering bearing the compliments and name of the donor, with a modest advertisement of the wares he is prepared to offer to the stove trade. If Mr. Gleason's urns and figures, tiles, stove knobs and hinge pins compare in artistic excellence with the gift that heralds them, they should prove unusually attractive ornaments for the fire stove. Each leaf of the calendar presents a charming design of a winsome little maiden at play with some dumb pet, beasts, birds and even fishes—the last of the gold and silver sort—being included in the domestic menagerie. The coloring is exceedingly delicate, and the general get up of the calendar makes it a real work of art, which would find a more fitting resting place on the walls of a lady's parlor than on those of a prosaic office room. The souvenir is one that will be highly prized by the fortunate recipients of Mr. Gleason's courtesy.

THE LEHIGH STOVE & MFG. COMPANY of Lehighton, Pa., favor us with a neat little calendar for the new year. The card is embellished with a floral design, lithographed in colors and worked in semicircular form about a *fac-simile* of the trade-mark of the company, and their name and address. The leaves constituting the calendar for the months are attached to the lower part of the card and are printed in bold faced type.

SINCE STARTING their works in January of the present year the Stamford

Foundry Company of Stamford, Conn., ran continuously, with the exception of four days in July, up to Friday, December 22, when they closed for taking account of stock. All things considered, the company have enjoyed a gratifying volume of trade, and state that they have made and sold more goods than in 1892.

We have received from Egley Brothers, Onarga, Ill., a holiday greeting in the shape of a neat folder showing what the firm designate as their "Pyramid for 1893." It consists of blocks, each representing a State or Territory, and indicating, we assume, the section of country in which the Owen wood stove is sold. At the bottom of the pile is the inscription, "Watch for our 1894 pyramid."

"A Trip Through the World's Fair with a Camera" is the title of a very handsome publication which has been distributed to their agents by George M. Clark & Co. of Chicago. It is a souvenir of the World's Columbian Exposition, and consists of numerous views of buildings, exhibits, &c., which must prove of value and interest to all who visited Chicago during the past summer as well as to those who were deprived of that pleasure. Two pages at the beginning of the little volume are devoted to general views of the Jewel gas and the Jewel process stoves manufactured by the company named. As time passes, and the fair loses its interest for publishers, these souvenirs will increase in value and will be more highly prized by their possessors. We understand that the company's gasoline stove catalogue will be ready for mailing to the trade within a few days.

The Ringen Stove Company of St. Louis, Mo., are distributing with their compliments a calendar for 1894, which conforms in general size, shape and arrangement to that which it has been their custom to send out for several years past. The device consists of a metal easel supporting a pad giving the days of the week and month, as well as affording space for memoranda purposes. Above the calendar proper are the name and address of the company, a *fac-simile* of their trade-mark and an indication of the line of goods manufactured. At the bottom of each leaf is also a reference to the Quick Meal goods. The device is so arranged that it may be set upon the desk or hung on the wall, as may be most convenient.

At a recent meeting of the Mississippi Valley Stove Company of Fulton, Ill., J. M. Meyers was elected president; Frank W. Dana, vice-president; E. B. Meyers, secretary and treasurer; J. M. Meyers, F. W. Dana, E. B. Meyers, Thomas J. Kintz and Jacob Martin, directors. Stock as follows was subscribed: E. B. Meyers, 140 shares; John M. Meyers, 140 shares; Thomas J. Kintz, 140 shares; Jacob Martin, 140 shares; C. C. McMahon, trustee for Fulton Development Company, 200 shares. This is a new enterprise in which Ohio capitalists are interested. The works are now in course of erection.

The plants of the Perry Stove Company and Rathbone, Sard & Co., at Albany, N. Y., have been shut down for the purpose of taking the annual inventory of stock and making necessary yearly repairs. President Nathan B. Perry of the Perry Stove Company, says: "Our object in ceasing operations at our Van Rensselaer Island plant was for inventory and repairs. There is nothing unusual about this, as we always close at this season of the year. There is, in addition to taking an inventory, a need of certain repairs, which could not be made if the works were in operation. Furthermore, at this season of the year, the days are so short and the weather is such that we cannot carry on our work satisfactorily. We have worked as many days this year as in 1892 and have kept our men pretty busily employed. We have run constantly since last January, except during one week in the intense heat of the summer and the employees have earned a rest. We cannot say when we will start the plant again, perhaps not before the first of February. There is no absolute necessity of operating at this season, for the reason that dealers have their stock for winter trade, and it is true that business is dull just at this time. The closing is not due to the business depression, as the trade of the Perry Stove Company has been good. But business might have been better, and I am of the opinion that it would have been better if affairs had been conducted differently by the Administration. However, we will be ready to go on with stove working as soon as the necessary work has been completed. Last year the men did not return to their places in the foundry until some time in January, so you see there is nothing unusual about the shut down at this time." Vice-President Grange Sard of Rathbone, Sard & Co., said: "The foundry of our company has been closed to allow our inventory to be taken. It is our custom to take an inventory at this time of year, and when that is completed the works will be ready to resume operations."

Hart & Crouse of Utica, N. Y., have leased the foundry of one of the shops of the Eureka Mower Works for a year. Until the completion of their new plant in East Utica they will use the same in which to manufacture their Royal heaters. The Eureka plant is one of the largest and best equipped in the city. Hart & Crouse will take possession January 1, and shortly afterward will have from 60 to 70 men at work making hot air, hot water and steam heaters.

The Weir Stove Company, Taunton Mass., resumed operations at their works at Weir Village on Thursday, December 21, after a shut down of a week.

The Midway is a double oven range which has just passed through its first season with results that have been highly satisfactory to the Leibrandt & McDowell Stove Company, Philadelphia. In appearance it is substantial and pleasing, and, having a large fire box, large water back and two large ovens, with a large elevated hot closet, it has a large cooking capacity and is of the popular style, requiring no brick work.

The culinary department of the Hotel Powelton, at Philadelphia, was fitted out complete with ranges, broilers and utensils by W. H. Ingram, 106 North Third street, Philadelphia.

A. King has assumed the management of the Philadelphia office of the Keeley Stove Company of Columbia, Pa., and brings with him the experience of several years on the road through Pennsylvania.

C. B. Smythe, representing F. M. Borden & Bro., 118 North Second street, Philadelphia, is already out on the road talking New Process and Splendid Novelty gasoline stoves and Challenge Iceberg refrigerators.

The stove foundries at Royersford Spring City, Pa., all observed the holidays by shutting down.

J. Ellwood Yeager will begin the year at 56 North Second street as the sales agent for the Yeager-Hunter Spring City Stove Works, and will carry a full line of New Era goods. He will have a New Era gasoline stove and a variety of refrigerators to show his many friends in the trade.

The Leibrandt & McDowell Stove Company of Philadelphia have a new catalogue in course of completion which will contain several new stoves.

The Thomas, Roberts, Stevenson Company of Philadelphia will make an exhibit of their Active Fortune and gauze door ranges at the Pure Food Exposition in Washington, which begins January 15 in Albaugh's Opera House.

F. Sabin, 146 North Second street, Philadelphia, makes a fine display of the Colonial Fortune range, one of the latest productions of the Thomas, Roberts, Stevenson Company, for use in fine residences.

The Tycoon is a new square open fire double heater that has just made its appearance on the sample floors of the Leibrandt & McDowell Stove Company, Philadelphia. It is of attractive design and decorated with nickeled trimmings. The outer ornamental casting surrounds a sheet iron body lined with fire brick, with an air passage between, which, they claim, will supply an abundance of warm air for an upper room or effect a thorough circulation in the room in which it is placed. A feature is a new patented telescoping draft slide, by which double the usual draft opening is secured, and which is indispensable with open stoves. A handsome blower stand is furnished with each stove. This stove is also made as a fire place heater, retaining all of its beauty and excellence.

Bergstrom Bros. & Co. of Neenah, Wis., manufacturers of Royal stoves and ranges, are distributing a fine wall calendar for 1894. It is of good size with a full leaf for each month, on which the figures are printed in large clear type. The leaves are fastened to a heavy card, on which the name of the firm appears in shaded gilt letters on a pink background. Their trade-mark forms a feature of the ornamentation in the margin. A full calendar for 1894 occupies the space on the back under the monthly leaves.

The Michigan Stove Company have presented their friends and patrons with a very pretty Christmas souvenir this year. It is a lead pencil, made of aluminum, and contains a sufficient supply of lead with which to note almost any number of pleasant events. The handsomely printed circular accompanying the gift expresses the hope that it may prove useful in recording a successful year, and we heartily echo the sentiment. The company have also distributed a picture card in colors, on the reverse side of which is a puzzle that will doubtless prove a source of much entertainment in endeavoring to arrive at its successful solution.

A press dispatch from Ironton, Ohio, of December 27, reports that the Hanging Rock Stove Foundry was destroyed by fire on that day. One thousand stoves and 500 patterns are said to have been lost, together with all the buildings connected with the foundry. The total loss is estimated at $60,000.

TRADE REPORT.

The Iron Market.

There have only been surface indications concerning the probable course of events in the near future, and they have fortunately not been of an altogether discouraging character. It is true that work is wanted everywhere, and in the majority of branches it is wanted desperately. But it is a fact also that in some lines business is coming up quite well. Thus it is estimated that contracts for 50,000 to 60,000 tons of Cast Iron Pipe will be closed during the next 30 days, which is a good indication that municipalities are able to raise money. Besides this American shops are figuring on two orders for 23,000 tons in the aggregate for export. All this work will be taken at unprecedentedly low prices, since the leading shops throughout the country are cutting down to the bone.

The tonnage, however, is sure to be welcomed by Pig Iron producers, and is likely to impart tone to at least the Gray Forge end of the market. In Foundry grades a weaker feeling is developing, some of the Southern furnaces being again among the leaders of the anxious.

Pig Iron.—Current business in the New York market is very light, nor is any movement expected in the near future. Considerable work is coming up for the Pipe foundries in New England and locally. Contracts at Providence recently taken were at very low prices. We quote: Northern brands, $13.75 @ $14.50 for No. 1; $13 @ $14.25 for No. 2, at tidewater. Southern Iron, same delivery, $13 @ $14 for No. 1; $12 @ $13 for No. 2; $11.50 @ $12.25 for No. 3; $11.75 @ $12.25 for No. 2 Soft, and $12.25 @ $12.50 for No. 1 Soft.

Philadelphia advices report that so far as new business is concerned there is practically none in that market, everything being closed for the year. Prices are at the lowest on record, while the demand is relatively smaller than ever before. On general principles it is supposed that there must be a change soon, but how or when it is to come no one appears to know, and in the sense that there is no inclination to break away from the monotony, it may be said that no one seems to care. Some consumers have bought to cover the first three months' requirements, but the majority are taking hand to mouth lots, which, in fact, corresponds with their orders; that is to say, they have no orders of any account except such as are sent in from day to day. On the other hand, sellers are not particularly anxious to fill their order books at such prices as the market would afford, so that there is a tacit understanding on both sides to let the market take its course. Prices show no change from last week, but the market is so narrow that it is impossible to form any very definite opinion, although the chances are that on the right kind of offers good buyers could obtain concessions.

Local Coke is in comparatively good demand in Chicago. The usual carload trade is moving and a few contracts have been made for delivery the early months of next year, while the prospects are favorable for much more business of the same character. Southern Iron is quiet and Lake Superior Charcoal seems neglected. Quotations are now as follows for cash:

Lake Superior Charcoal	$15.50 @ $16.00
Local Coke Foundry, No. 1	13.00 @ 13.50
Local Coke Foundry, No. 2	12.50 @ 12.75
Local Coke Foundry, No. 3	12.00 @ 12.50
Local Scotch	13.50 @ 14.00
Ohio Strong Softeners No. 1	15.50 @ 16.00
Southern Silvery, No. 1	@ 13.75
Southern Silvery, No. 2	@ 13.25
Southern Coke, No. 2	12.15 @ 12.40
Southern Coke, No. 3	11.65 @ 11.90
Southern, No. 1, Soft	12.40 @ 12.65
Southern, No. 2, Soft	11.65 @ 11.90
Tennessee Charcoal, No. 1	16.00 @ 16.50
Alabama Car Wheel	18.25 @ 18.50
Jackson County Silvery	16.00 @ 16.50
Other Ohio Silvery	15.00 @ 15.50

The Pittsburgh Pig Iron market is absolutely featureless. Buyers are putting off making purchases just as long as they can, and when they do go in the market buy only enough to run them a short time. In addition, shipments on old contracts are being deferred to a very great degree by buyers who cannot use the Iron as fast as they expected and do not want to pile it up. Another feature of the situation and an important one is that only a limited number of furnaces have made contracts for Coke, and until more of these have been placed the uncertainty of the future as regards prices will continue. We are not advised of any transactions beyond a few sales of 100 and 200 ton lots, and repeat our quotations of last week as follows:

No. 1 Foundry	$11.75 @ $12.00 cash.
No. 2 Foundry	11.25 @ 11.50 "

There has been little or no business in the Southern Pig Iron market during the week, there being no inquiry for large lots for either present or forward delivery, and even the jobbing foundries have taken very few single carload lots. The tone of the market is weak, and especially for foundry grades of Coke Iron; and while there is little urgency to sell, there are indications cropping out now and then which indicate a desire on the part of some furnaces to secure orders. The shipments of the furnaces on old orders have been less liberal this week, and the melting of Iron appears to be much reduced, so many consumers have already contracted for Iron enough to last them much longer than they anticipated and will not be in the market for many weeks. The price of No. 1 Foundry Coke is $9; No. 2 do., $8; and No. 3 do., $7.50 ℔ ton, f.o.b. Birmingham. Charcoal Irons are merely nominal. Quotations are as follows:

Southern Coke, No. 1	$11.75 @ $12.00
Southern Coke, No. 2	10.75 @ 11.00
Southern Coke, No. 3	10.25 @ 10.50
Ohio Soft Stone Coal, No. 1	15.50 @ 16.00
Ohio Soft Stone Coal, No. 2	14.50 @ 14.75
Lake Superior Coke, No. 1	15.00 @ 15.25
Lake Superior Coke, No. 2	14.00 @ 14.25
Hanging Rock Charcoal, No. 1	18.50 @ 19.00
Hanging Rock Charcoal, No. 2	17.50 @ 18.00
Tennessee Charcoal, No. 1	14.00 @ 14.25
Tennessee Charcoal, No. 2	13.00 @ 13.25
Standard Southern Car Wheel	17.75 @ 18.00
Lake Superior Car Wheel and Malleable	17.00 @ 17.25

Metal Market.

Pig Tin.—Prices have remained almost stationary and the market is still bare of distinctly new feature, since speculation is virtually at a standstill, while consumers' purchases, to all accounts, are barely up to the average for the season. Steady inroads are being made upon jobbers' stocks, however, and free or unbonded stocks are in such shape that it is difficult to buy lots of 10 tons or more at less than 20.55¢ @ 20.60¢ for delivery this month or next. Jobbers' prices for small lots rule at 22¢ @ 22½¢ for Banca, and 21½¢ @ 22¢ for Straits Pig.

Copper.—Business has been of distinctly routine character and the demand at present is extremely tame. The offering is also reserved, and, except on Metal Exchange contracts, prices below those named by the leading producers or their agents are extremely few and far between. There is, however, enough of what is commonly termed "outside" offering to keep values in more than usually uncertain form. Fair quotations appear to be about 10⅝¢ @ 10½¢ for Lake Superior Ingot, 9⅞¢ @ 10¢ for Electrolytic and 9½¢ @ 9¾¢ for ordinary casting stock, according to brand and delivery. Jobbing business in both Ingot and Sheet Copper continues quiet, quotations for small quantities being unchanged.

Pig Lead.—Prices have been moved a little higher, but the leading brokers note no sales of importance and profess to be ignorant of any conditions that should bring about an increase in the value of the metal. In other quarters

it is intimated that the advance is purely speculative, and that the speculative backing to the market is of very doubtful endurance. Consumers display a very limited interest in either Pig or Manufactured Lead, orders and inquiries being on an exceedingly moderate scale. For the present 3 25¢ is quoted for ordinary Western brands of Pig in carload or larger lots, and about ¼¢ ℔ lb more for small quantities from store.

Spelter.—Dealings have been on a very moderate scale. The demand has continued moderate also. While not particularly large, the offering has proven sufficient to keep prices rather soft at about 3.70¢ @ 3.75¢ for common, 3 80¢ for prime and 3.85¢ @ 3 90¢ for choice brands in carload or larger lots. Western Spelter in jobbing quantities is quoted at 4 50¢.

Antimony.—Except of small parcels there are few sales making and prices are easy, with 10¼¢ @ 10½¢ quoted for Hallet's, and 10¾¢ @ 11¢ for Cookson's, in small lots.

Tin Plate.—There has been hardly any buying during the past week and the demand at present is exceedingly tame. Orders for future deliveries have been few in number and for comparatively small quantities, while spot business is referred to as being below the average for the season. Such transactions as have passed have been wholly of the hand to mouth character which has marked this trade of late, consumers purchasing just enough to supply their bare wants. Prices on both prompt and future deliveries are somewhat soft, although showing no quotable changes. The British Tin Plate market, according to a cable despatch of December 27, was quiet, owing to the holiday season. Prices were weak, but not absolutely lower. Liverpool quotations were as follows:

IC Charcoal, Alloway grade.....12/3 @ 12/9
IC Bessemer Steel, Coke finish. ...11/3 @ 11/6
IC Siemens " " " .....11/6 @ 11/9
IC Coke, B. V. grade, 14 x 20.....11/3 @ 11/6
Charcoal Terne, Dean grade.....10/9 @ 11/

Sheet Iron.—Black Sheets are dull, with prices unchanged. Some good inquiries are noted for Galvanized Iron, which is now in ample supply. Prices are a little weaker; several lots from stock selling at about 70% @ 70 and 5% off.

WE CAN NOW STATE upon good authority that the Irondale Steel & Iron Company, whose works were recently burned down at Anderson, Ind., will build a new plant at Middletown, notwithstanding contrary reports. Machinery not too badly damaged during the fire will be removed to the new location a few miles distant, and used in connection with such new parts as may be necessary. The plant will not be as large as originally intended, but it will be constructed in a manner that will admit of extension whenever the state of trade warrants such a course of action. The product of the new works will be Iron and Steel Sheets of the lighter gauges.

Chicago Report.

Scrap.—Very little business has transpired in Old Material. Consumers have deferred purchases until January. Dealers furnish the following list of buying prices, Chicago delivery:

	Per net ton.	Per ℔
No. 1 Wrought Scrap	$7.00	....
Machinery Cast	7.00	....
Malleable Cast	6.00	....
Stove Plate (free of burnt)	5.00	....
Burnt Iron and Grate Bars	3.50	....
Sheet Iron and Hoops	2.00	....
Plow Steel and Breaking Stock	5.50	....
No. 2, such as Shovels, Hoes, &c	4.00	....
Old Boilers—whole (Iron)	4.00	....
" (Iron)—cut in single Sheets and Rings	6.00	....
Old Gas-Pipe and Boiler Tubes	5.00	....
Cast Borings	3.25	....
Turnings	4.00	....
Horseshoes	7.00	....
Copper Bottoms	....	5 ¢
Copper Clips and Heavy	....	7 ¢
Heavy Brass	....	5⅛¢
Light Brass	....	3⅛¢
Pipe Lead	....	2⅛¢
Tea Lead	....	2 ¢
Zinc	....	2 ¢
Rubber	....	4 ¢

Anthracite.—There is almost complete stagnation in the Chicago Anthracite trade. Prices are weak, but no change has been made in the schedule. Carload lots of 12 net tons or over are quoted as follows:

	Grate.	Egg, Sto. and Ch.
Chicago, Ill	$5.85	$6.10
Milwaukee, Wis	5.85	6.10
Kansas City, Mo	9.05	9.30
Council Bluffs, Iowa	9.05	9.30
Lincoln, Neb	9.20	9.45
Sioux City, Iowa	9.05	9.30
Aberdeen, S. Dak	9.10	9.35
Dubuque, Iowa	7.15	7.40
Madison, Wis	7.35	7.60
St. Paul, Minn	8.35	8.60
Burlington, Iowa	7.35	7.60
Des Moines, Iowa	8.80	9.05
Davenport, Iowa	7.15	7.40
St. Joseph, Mo	9.05	9.30
Leavenworth, Kan	9.05	9.30
Omaha, Neb	9.05	9.30

Colorado Anthracite.

COLORADO FUEL & IRON COMPANY.

Denver	$8.00
Pueblo	8.00
Colorado Springs	8.00
Leadville	8.00
Cheyenne, Wyo	10.00
All points between Denver and Missouri River	8.55

THE BOSTON FILTER COMPANY, 21 Broadway, Chelsea, Mass., manufacturers of the Boston Water Purifier, sell their small Filters, but large ones, such as are used by hotels and restaurants, are put in at no original expense to the user, the company charging a nominal rent for the work of the Filter, and taking complete care of the apparatus. Although Boston has been noted as a great consumer of spring waters, the company advise us that they are successfully furnishing 90 per cent of the large hotels and restaurants in the city with their Filters.

A FEW months ago *The Metal Worker* made the statement that No. 27 gauge sheet iron for roofing purposes, which is called No. 27 standard, but really weighs $\frac{84}{100}$ pounds per superficial foot, was sold at $2.65 per 100 pounds, free on board mill. Exception was taken to the statement, although it was proved to be correct. We are now able to state positively that this same material is being sold at $2.50 per 100 pounds, free on board mill.

CONDITION OF THE

Hardware Trade.

THE last week of December is devoted more to preparations for closing the year's business than to active attention to trade, which, except in a few holiday and seasonable specialties, is decidedly light. The matter of making the annual inventory is now in hand with a view to closing the books and estimating the financial results of the year. It is expected that inventories will in most cases show a diminished stock, owing to the conservative policy which has been pursued for the last half of the year, and if the balancing of the books does not show diminished profits there will be reason for exceptional congratulation. Most merchants and manufacturers will, however, probably be confronted by the fact that business during the year was considerably less remunerative than usual, but if their losses were not especially heavy, and they are still in condition for the active prosecution of business in the more prosperous days which it is hoped are before the trade, they have good reason for contentment. The year which is ending will long be remembered as in many respects the most trying one in the experience of the present generation of business men. It, however, draws to a close with the promise of better things in the year to come, and as soon as tariff uncertainties are removed it is hoped that there will be a gradual if not a prompt resumption of normal business activity and profit. The reaction from the curtailment of industry must sooner or later come, and the economies which have been enforced during the hard times will be an excellent preparation for a more healthful and permanent prosperity in which we doubt not the Hardware trade will have full share.

Advices from Chicago.—The jobbing houses are now passing through their usual dull holiday season. Salesmen are either at home or on their way home, and mails are light. Most of the houses here are taking stock and are not specially anxious to be troubled with business at this time. Quite a number of salesmen for Eastern Hardware concerns are traveling through this section soliciting orders for the coming year, but they are not meeting with much encouragement. Jobbers will continue their policy of buying from hand to mouth, except when they are actually offered bargains, until they see some indications of prices hardening.

Notes on Prices.

Wire Nails.—During the past week the volume of business has been light, though it is understood that the low prices ruling have induced the placing of some good orders. The general de-

mand is, however, moderate, the trade not being confident that the lowest prices have yet been touched and deferring their purchases until the opening of the new year. There have been no further developments in the matter of prices, the market being represented as a week ago by the quotation of $1.10 for carload lots at mill, it being, however, understood that this figure is shaded on especially large and desirable assortments. Some of the mills are understood to be fairly well supplied with orders, but others have a good stock on hand and are stopping or curtailing production. In the present condition of the market large buyers will do well to watch it closely, as there is no doubt that for desirable quantities and assortments and for deliveries more or less prompt they can secure more advantageous prices and terms than a few months ago were deemed possible.

Advices from Chicago.—The Wire Nail trade is reported quiet by the manufacturers, and there are few large inquiries from buyers, who are holding off until they are convinced that prices are as low as they are likely to go at this time. Some factories are reported so well sold up that they will go into the new year with a smaller stock than ever before. Nevertheless prices are lower and factory lots are now selling at $1.18½ to $1.25, Chicago. Small lots from stock are sold at $1.30 to city trade and $1.35 to the country.

Cut Nails.—The Cut Nail market is inactive, and purchases are limited by the necessities of buyers. The market in the matter of price is in the same condition as for several weeks, being represented by the quotation of 90 cents for carload lots at mill, a figure which is slightly shaded in the presence of attractive specifications. It is not unlikely that orders especially desirable in the matter of assortment and terms of payment could be placed with some manufacturers at a somewhat lower figure. Small lots from store in New York are quoted at $1.20 to $1.25.

Advices from Chicago. — Cut Steel Nails are quiet, with prices nominally unchanged at $1.15 to $1.20, according to the character of the order. Small lots from stock are quoted at $1.25.

Barb Wire.—Barb Wire continues in substantially the same condition as at our last review, being represented by the quotation of $2.10 for Galvanized and $1.70 for Painted, with 5 cents off in carload lots. The demand is light.

Advices from Chicago.—The Barb Wire market here has weakened and quotations of Galvanized are now made by manufacturers at $2 15, Chicago. The break comes from the East and local manufacturers refuse to meet the cut, as they are selling most of their product direct to the retail trade in small lots, for which they are receiving from $2.30 to $2.35. Jobbers quote small lots from stock at $2.50.

Cordage.—In sympathy with reduced prices for raw material and in the presence of continued active competition among the manufacturers and a very light demand, there has been a decline of about ¼ cent per pound in the prices of Manila and Sisal Rope, Manila being obtainable in large lots at 7¼ cents, and Sisal at 5 cents, terms f.o.b. factory or New York, subject to a discount of 1½ per cent. for cash. New Zealand remains unchanged at 5 cents.

Glass.—There appears to be no encouragement in the way of improved prices or demand for factories to go into blast, or for factories already making Glass to continue in operation. This includes both the Sheet Window Glass and Plate Glass industries. Factories are not likely to be continued in operation unless they have orders to work on, as they see nothing to be gained in piling up stock. It is difficult to obtain reliable quotations, but taking the quotations given in our last issue as a basis, there are no indications of any advance, but if anything the market is weaker.

Old Metals.—The market for Old Metals is dull, with buyers' prices ruling the same as those quoted last week, namely, for New York delivery:

Heavy Copper	℔	7¢
Light and Tinned Copper	℔	6½¢
Heavy Brass	℔	5¢
Light Brass	℔	4½¢
Lead	℔	3¢
Tea Lead	℔	2¾¢
Zinc	℔	2½¢
No. 1 Pewter	℔	14¢
No. 2 Pewter	℔	6¢
Wrought Scrap Iron, ℔ gross ton	$7.00 @	$8.00
Heavy Cast Scrap, ℔ gross ton	8.00 @	9.00
Stove Plate Scrap, ℔ gross ton	4.00 @	5.00
Burnt Iron, ℔ gross ton	2.50 @	3.00

Old Rags, Paper, &c.—Business shows no signs of greater activity. Paper mills are fairly well stocked up, both East and West, and no contracts for Paper stock of any importance are being entered into at present. The market is likely to remain quiet until toward the middle of next month, when stock taking and the adjustment of accounts have been completed. Prices are practically unchanged, New York quotations being as follows:

No. 1 White Rags	℔	3¼ @ 3½¢
No. 2 White Rags	℔	2¼ @ 2½¢
Mixed Rags	℔	¾¢
Blues and 3ds	℔	1 @ 1¼¢
Hard Sized White Shavings	℔	2¼ @ 2⅝¢
No. 1 White Book Shavings	℔	2 @ 2⅛¢
No. 2 White Book Shavings	℔	1 @ 1⅛¢
Light Book Shavings	℔	¾¢
No. 1 Mixed Shavings	℔	¾ @ 1¢
No. 2 Mixed Shavings	℔	½ @ ¾¢
No. 1 Printed Books	℔	1 @ 1¼¢
Ordinary Mixed Books	℔	⅛ @ ¾¢
Newspapers	℔	½ @ 3-5¢
No. 1 Manila Paper	℔	1 @ 1⅛¢
No. 2 Manila Paper	℔	⅝ @ ¾¢
Bogus Paper	℔	½¢
Common Paper	℔	@ ⅜¢
Straw Chips	℔	@ ½¢
Binders' Clippings	℔	½ @ ⅝¢
Jute Butts	℔	1⅞ @ 2 ¢
No. 1 Jute Bagging	℔	1 @ 1¼¢
Mixed Bagging	℔	¾ @ 1 ¢
No. 2 Bagging	℔	½ @ ¾¢
Hemp Twine	℔	2 @ 2¼¢
Manila Rope	℔	2¼ @ 2⅝¢
Jute Rope	℔	1½ @ 1⅝¢
Mixed Rope	℔	¾ @ ⅞¢

Old Rubber.—The market for this material is a very narrow one, and values continue low. The following are about the prices given for Old Rubber delivered in New York:

Car Springs, ton lots, ℔	@	$0.03¼
Rubber Shoes, carloads, delivered at factory, ℔	@	.03
Rubber shoes, less than carloads, ℔	@	.03⅛
Large Hose, ℔ ton	@	9.00
White Wringer Rolls, ℔	@	.04¼
White Syringes, ℔	@	.05

Trade Notes.

BAUGHMAN MFG. COMPANY of Orrville, Ohio, have been incorporated, with a capital of $75,000, for the manufacture of brass and copper goods.

THE TENDENCY of trade publications toward greater elaborateness and less conspicuous advertisement is well shown in a portfolio of engravings distributed by the Sickles, Preston & Nutting Company of Davenport, Iowa, as a Christmas greeting to their friends. The publication, which measures 14 x 11 inches in size, contains six very handsome half-tone engravings of paintings.

WE ARE INDEBTED to George B. Blizard, 108-110 Marion street, Philadelphia, Pa., for a pretty calendar for the year 1894. It is a card to hang up on the wall, with the calendar, consisting of monthly sheets, on the lower end. One side of the card is prettily decorated, while the blank space at the right contains the business announcement of Mr. Blizard, who does all kinds of Sheet Metal Work, besides erecting heaters and ranges.

THE ATTENTION of the trade is directed to the page advertisement of the Apollo Iron & Steel Company, Pittsburgh, Pa., which appears elsewhere in this issue. This advertisement is of decidedly unique character, and is composed of the six inside pages of the price-list recently issued by that firm, and to which attention has already been directed in these columns. The plant of this firm, located at Apollo, Pa., is now in operation to nearly full capacity, with the outlook for the new year decidedly promising.

THE STOVE AND TINWARE STORE of E. A. Fisher, Manchester Centre, Vt., was destroyed in an extensive fire which visited that town on December 22. The loss was partly covered by insurance.

THE JOSEPH LE COMTE MFG COMPANY were incorporated at Albany, N. Y., on December 22, to manufacture Plate, Tinware, Sheet Iron, Metal and Stamped Ware in Brooklyn, N.Y., with a capital of $100,000. The directors are Joseph Le Comte and John Brunnemer of Brooklyn, and Victor S. Le Comte of New York City.

THE LUDLOW-SAYLOR WIRE COMPANY, St. Louis, are closing the year with a full order book in their Art Metal department. They are making a number of Directory Frames for the new 14-story Union Trust Building, St. Louis, and also a number for the Realty Building; also a lot of artistic Stair Rails for the residence of Fred. T. Lock, Birmingham, Ala., and a Stair and Floor Rail for the Eddy office building, Bloomington, Ill.

THE PLANT of Randolph & Clowes, Brass manufacturers, at Waterbury,

Conn., closed down on the 23d for one week for the purpose of taking inventory and making minor repairs. The works will reopen January 2 with a prospect for steady work.

The Cambridge Roofing Company Cambridge, Ohio, are adding new machinery and making improvements, notwithstanding hard times. They have recently placed an order with Geo. C. Keene & Co., Cincinnati, for a stand of Corrugating Rolls. A Corrugating and Forming Press made by the same company has just been placed in position in the works of the Cambridge Company.

The New York Asbestos Mfg. Company were recently incorporated, with a capital of $50,000, to manufacture Non-Conducting Boiler and Pipe Covering, Packing and Cement of all suitable materials, especially asbestos. The factory will be located in the city of New York. The directors are Albert Lantzke of Brooklyn, and Adolph Juenger and Henry Schreiter of New York City.

The Enterprise Mfg. Company of Pennsylvania, Philadelphia, advise us that their stock of parts for Great American Meat Cutters is rapidly becoming exhausted, and that in future they can only supply such parts as they may have on hand at time of order, having decided not to continue the manufacture of the Great American Meat Cutters or the parts thereof.

The Illinois Pure Aluminum Company, Lemont, Ill., are manufacturing an Aluminum Sanitary Pail. This article weighs 2½ pounds and is designed for use in hospitals, asylums and public institutions of any description. It is recommended for these uses because of its lightness, perfect cleanliness and freedom from odor, and because it is proof against corrosion.

Knoll & Dorer are a new firm of metal spinners at 104 Centre street, New York, who make a specialty of Brass and Copper Cuspidors, Tea Kettles, Measures, Urns and Trays.

The Griswold Mfg. Company, Erie, Pa., send out a pretty souvenir for New Year's Day, which includes a two-page circular prettily printed in red and blue. On the outside is an advertisement of the concern, while within are a half dozen verses entitled "Seasonable Sauce," which begins with a general greeting, reference to their ware and the commendation it received at Chicago, followed with a reference to their enameled covering; further mention of their Erie griddles, and a final verse mentioning a little griddle that is sent with the announcement. This is a *fac-simile* in cast iron of the larger article reduced to 3 inches in diameter.

On December 26 the Stove and Tinware store of Wm. R. Kine, at Van Wert, Ohio, was destroyed by fire. The loss, which is estimated at $3000, is stated to be fully covered by insurance.

An interesting patent decision has recently been rendered by Judge Putnam in the case of Edmund Converse against Ambrose T. Matthews, both of Worcester, Mass., for the alleged infringement of a patent relating to stove knobs, in which the base is made from a blank with wings or leaves, instead of from a circular piece of sheet metal, as has heretofore been the case. We understand that the decision of Judge Putnam broadly sustains the patent, and cannot fail to interest all manufacturers and dealers in stoves. The patent is owned by the Worcester Ferrule & Mfg. Company of 17 Herman street, Worcester, Mass.

HEATING NOTES.

The Philadelphia office of Jenkins Bros. is now at 117 North Fourth street, where the arrangement of their line of valves in the new quarters makes a busy scene. After the first of the year they will be prepared to furnish standard flanges as provided for by the resolution of the National Association of Steam and Hot Water Fitters.

From C. F. Bachler of the Philadelphia office of the Monitor Steam Generator Mfg. Company, Landisville, Pa., we learn that the trade in their steam and hot water boilers has been so satisfactory during the past year that steps are being taken to double the producing capacity of their plant in time for next year's business.

The popularity of small hot water heating plants for residences in the vicinity of Philadelphia is noted by the H. B. Smith Company, 510 Arch street, by the sale of 40 Cottage boilers in the month of December from that office alone.

SCRAP.

Another tin plate works is projected at Elwood, Ind. The promoters are I. L. Morris of Chicago, Edwin Stevens of Cincinnati and E. Levy of Elwood. Mr. Morris was formerly superintendent of the sheet mills of the Corning Steel Company. They have organized a company with a capital stock of $300,000, and propose to erect a rolling mill to roll black plates and to manufacture 2500 boxes per week. They announce that work on the buildings will begin at once.

A London dispatch of December 25 intimates that the tin plate workers of Neath, Wales, have accepted their employers' ultimatum of a 10 per cent. reduction of wages. Their action is considered important, as it is expected to lead to a change in the scale of wages fixed in 1874.

J. Foerster & Son, 806 East Fifth street, New York, have recently secured the following contracts: Copper cornice, dormers, finials, tin and slate roofing and copper cable lightning rod on the Drew Seminary, Madison, N. J.; copper work on the passageways in the German Hospital, Seventy-seventh street and Lexington avenue, New York; copper and galvanized iron cornice and finial work for convent in Bleecker street, near Central avenue, Brooklyn; ornamental trimmings on the stage front to the theatre of the Staten Island Turn Verein, Stapleton, S. I.

Coal fishing is a curious industry prevailing at the town of Northumberland, on the Susquehanna River. The bed of the stream in this vicinity is thickly lined with coal, washed down from various colliery centers and prevented from going beyond Northumberland by a large dam. The fuel thus recovered from the river last year amounted to 4000 tons, which was sold at an average price of $2.20 per ton.

Tramps are flocking into Kansas in great numbers in consequence of a circular recently issued by Governor Lewelling instructing the police not to molest them and declaring the vagrant law unconstitutional. The Governor has a fellow feeling for the vagabond fraternity, as he confesses to having been a member of it in his early years.

The Lansdale Foundry of the Abram Cox Stove Company, Philadelphia, has shut down for the usual stock taking after a run without any stoppage whatever since February 4 last.

We learn from J. Woodruff & Sons, Salem, Ohio, that the season just closed has been a remarkably satisfactory one to them, and that their business shows a flattering increase over past seasons. They close down December 30, to take inventory and make necessary repairs, but will resume with full force January 15, 1894. The works of the company have run continuously every working day during the year 1893, in spite of hard times and the panic.

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Metal and Miscellaneous Prices.

CHICAGO, DECEMBER 28, 1893.

Tin—

Straits pigs.....23¢

Imported Tin Plates—

Charcoal Plates.—Bright.

Guaranteed Plates command special prices, according to quality.

		Per box.
Calland and Melyn Grade	IC, 10 x 14	@ $6.75
	IC, 12 x 12	@ 6.75
	IC, 14 x 20	@ 6.75
	IC, 20 x 28	@ 13.50
	IX, 10 x 14	@ 8.75
	IX, 12 x 12	@ 8.75
	IX, 14 x 20	@ 8.75
	IX, 20 x 28	@ 17.50
	DC, 12½ x 17	@ 6.50
	DX, 12½ x 17	@ 8.50
Allaway Grade,	IC, 10 x 14	@ 6.50
"	IC, 12 x 12	@ 6.50
"	IC, 14 x 20	@ 6.50
"	IC, 20 x 28	@ 13.00
"	IX, 14 x 20	@ 8.00
"	IX, 20 x 28	@ 16.00

Coke Plates—Bright.

	Per box.
Steel Coke—IC, 10x14.14x20.	$5.65 @$5.75
IC, 14x20.90 ℔	@ 5.25
IC, 14x20, 100℔	5.50 @ 5.65
10 x 20	@ 8.50
20 x 28	11.30 @11.50
IX, 10x14, 14 x 20	@ 7.25
B.V. Grade. IC,10x14, 14x20.	5.75@ 5.85

Charcoal Plates.—Terne.

Guaranteed Plates command special prices, according to quality.

Hansel and Dean Grades.—	
IC. 14 x 20	@ $5.62½
20 x 28	@ 11.25
IX. 20 x 28	@ 14.25
Worcester Brand and equal.—	
IC, 14 x 20..	6.12½@ .....
IC, 20 x 28.	12.25 @ .....
IX, 14 x 20..	7.62½@ .....
20 x 28.	15.25 @ .....

American Tin Plates.

Charcoal Plates.—Bright.

Irondale, A. A.—IC, 14 x 20	$7.00
" " IX, 14 x 20	9.00
" " IXX, 14 x 20	11.00
" " IC, 20 x 28	14.00
" " IX, 20 x 28	18.00
" " IXX, 20 x 28	22 00
Florence.—	
IC, 10 x 14, 12 x 12, 14 x 20..	$6.75
IX, 10 x 14, 12 x 12, 14 x 20..	8.50
Palma.—	
IC, 10 x 14, 12 x 12, 14 x 20..	$7.25
IX, 10 x 14, 12 x 12, 14 x 20..	9.25

Each extra cross $2.00 and 20 x 28 double these prices.

Brilliant, Tissue Packed, IC, 14 x 20.	$9.25
Royal, extra, IC, 14 x 20	7.25
Merion, IC, 14 x 20	7.00
Almond, IC, 14 x 20	6.50
Mint, IC, 14 x 20	6.25

Coke Plates.—Bright.

Elwood.—IC, 14 x 20	$6.00
" IC, 20 x 28	12.50

Roofing Plates.

Arch, IC, 20 x 28	@$11.75
Crescent, IC, 20 x 28	@ 12.25
Crescent, IX, 20 x 28	@ 15.25
Empire, IC, 20 x 28	@12.50
Empire, IX, 20 x 28	@15.50
Hickory, IC, 20 x 28	@ 12.75
" IX, 20 x 28	@ 15.75
Alaska (heavily coated), IC, 20x28	@$14.50
Alaska IX, 20 x 28	@ 17.75
Special, IC, 20 x 28	@ 15.50
" IX, 20 x 28	@ 18.50
Merchant's Roofing (extra coated), IC, 20 x 28	@$17.75
Merchant's Roofing (extra coated), IX, 20 x 28	@$21.50
Merchant's Old Method, (extra heavily coated), IC, 20 x 28	@$19.75
Merchant's Old Method (extra heavily coated), IX, 20 x 28	$23.60
Irondale A:	
IC, 14 x 20	$6.25
IX, 14 x 20	7.75
IC, 20 x 28	12.50
IX, 20 x 28	15.50
Westmoreland:	
IC, 14 x 20	$6.25
IC, 20 x 28	12.50
Elwood:	
IC, 20 x 28	$12.00
Juno:	
IC, 14 x 20	$5.75
IC, 20 x 28	11.50
Illinois, Old Method:	
IC, 20 x 28	$17.00
E. L.:	
IC, 20 x 28	$12.50
Jessie:	
IC, 20 x 28	$12.00
Scott's Extra Coated, Stamped and Resqured, IC, 14 x 20	$9.50
Scott's Extra Coated, Stamped and Resqured, IX, 14 x 20	11.00
Scott's Extra Coated, Stamped and Resqured, IC, 20 x 28	19.00
Scott's Extra Coated, Stamped and Resqured, IX, 20 x 28	22.00
Neville, Stamped, IC, 14 x 20	6.25
" " IX, 14 x 20	7.50
" " IC, 20 x 28	12.50
" " IX, 20 x 28	15.00
Taylor's Old Style, IC, 14 x 20 (Stamped and Resqured)	$9.50
Taylor's Old Style, IC, 20 x 28 (Stamped and Resqured)	19.00
Taylor's Roofing, IC, 14 x 20 (Stamped and Resqured)	8.25
Taylor's Roofing, IC, 20 x 28 (Stamped and Resqured)	16.50
Columbia, IC, 14 x 20 (Stamped)	7.25
" IC, 20 x 28 (Stamped)	14.50
Maple, IC, 14 x 20 (Stamped)	6.75
" IC, 20 x 28 (Stamped)	13.50
Willow, IC, 14 x 20	6.50
" IC, 20 x 28	13.00
Knoxall, IC, 14 x 20	6.25
" IC, 20 x 28	12.50
Globe, IC, 14 x 20	6.00
" IC, 20 x 28	12.00
Miami, IC, 14 x 20	6.00
" IC, 20 x 28	12.00
" IX, 20 x 28	15.00
" (Redipped), IC, 20 x 28	17.00

Tin Boiler Plates.

	Per box of 100 sheets.	Per box of 112 sheets.
X, 14 x 28	$13.00	$13.00
XX, 14 x 28	14.50	14.50
X, 14 x 31	14.50	15.80
XX, 14 x 31	16.50	17.50
X, 14 x 56	29.50	16.50
XX, 14 x 56	32.50	18.20
X, 14 x 60	31.50	17.65
XX, 14 x 60	35.50	20.90

Sheet Iron—

Black.

Nos.	Common American	Refined.
Nos. 10 to 16	℔ 2 6-10¢	3 2-10¢
17 to 20	℔ 2 7-10¢	3 3-10¢
21 to 24	℔ 2 8-10¢	3 4-10¢
25 and 26	℔ 2 9-10¢	3 5-10¢
27	℔ 3¢	3 6-10¢

Russia, Planished, &c.

Genuine Russia, all numbers....13¢ net.
Patent Planished....℔ D A, 10½¢; B, 9½¢
dis. 5%
Craig's Polished Sheet Steel.....8½¢

Galvanized.

Juniata or first quality..dis.70&7½@10%

Copper—

Ingot.

Lake.....12¢ @ 12½¢
Casting Brands.....11¢ @ 11½¢

Sheet and Bolt.

Discount, 25%.

Copper Bottoms.

Discount, 25%.

Seamless Brass and Copper Tubes.

Base price, 17½¢, Chicago, with extras according to size.

Copper, Bronze and Gilding Tube, 3¢ ℔ D additional.

Brazed Brass Tubing.
(To No. 20 inclusive.)

Add freight from New York to Chicago to these prices, or 50¢ ℔ 100 ℔.

Above 5-16 inch to 3 inch inclu...35¢
Plain, above 3 inch.....45¢
Plain, 5-16 inch.....45¢
Plain, ¼ inch.....60¢
Plain, 3-16 inch.....$1.00
Plain, ⅛ inch.....$1.50
Fancy Tubing, Brass, to No. 20 incl.....43¢ ℔ D
Bronze Tubing, 3¢ ℔ ℔ more than Brass.....

40 @ 45%

Roll and Sheet Brass.

Discount, 35 @ 40%.

Slab Spelter—

Western Spelter.....5

Sheet Zinc—

600 ℔ casks.....5
300 ℔ casks.....5¼
Loose sheets.....5½¢

Lead—

Soft Pig Lead.....3¾¢
Bar.....4¼¢
Pipe.....5½¢, dis. 10¢
Block Tin Pipe.....35¢
Sheet.....6¢, dis. 10%

Solder—

½&⅝.....12¾¢@13¼¢
Extra Wiping.....11½¢

The prices of the many other qualities of Solder in the market indicated by private brands vary according to composition.

Antimony—

Cookson.....12¢@12½¢
Hallett's.....11¼¢@11½¢

Wrought-Iron Pipe—

List on following page.

1¼ and under, Plain	57½&10%
1¼ and under, Galv	50½&10%
1½ and over, Plain	67½&10%
1½ and over, Galv	67½&10%
Boiler Tubes, list Oct. 24, 1892	67½&10%
Casing, list Nov. 16, 1892	65@67½%
Inserted Joints Casing, list Nov. 16, 1892	52½%
Steel Boiler Tubes	47½%
Cold Drawn Seamless Steel Tubing	50%

Cast-Iron Soil Pipe—

Cast-Iron Soil Pipe, Tarred; sizes 2 to 6 inches, inclusive.....dis 70&10%
Other sizes.....dis 60%

Leader Pipes—

Abendroth's Galv. Spiral Riveted	60%
Austin's Corrugated	60%
Gordon & Gilbert's Corrugated	60%
Ritchie's (Galv. Iron only) Cor'd	60%
Ritchie's Spiral Lock Seam, Galv'd	55%
Austin's Spiral Ribbed Pipe	60%
Plain Adjustable Elbows	60%
James A. Miller Bros. (Galv'd Iron only) Corrugated	60%

Furnace Fittings—

Discount from Excelsior Steel Furnace Co.'s list.....50%

Steel Roofing—

Perfection	$3.75 square
Climax	3.50 square
The Lloyd Spanish Tiling	4.50 square

Metallic Shingles—

Cushman's	$1.25 square
Merchant & Co.'s Spanish Tiles:	
Copper, 14 oz	$36.00 square
Tin	$9.75@$14.25 square
Steel, painted	$9.00 square

Drain Pipe—*Tile.*

Discount from list.....70%

Paints, Oils, &c.—

Deodorized Benzine	7½@8 ¢
Iron Paint, Bright Red	℔ D, 2 ¢
" " Brown	℔ D, 1½ ¢
" " Purple	℔ D, 2½ ¢
" Ground in oil, B. Red	℔ D, 6½ ¢
" Ground in oil, Red	℔ D, 6½ ¢
" Ground in oil, Brown	℔ D, 5½ ¢
" Ground in oil, Purple	℔ D, 6 ¢
Linseed Oil, Boiled, in bbls	48¢
Linseed Oil, Raw, in bbls	45¢
Mineral Paints	2@4¢
Orange Mineral	10¾¢
Pure White Lead in Oil	6¾@7¼¢
Dry White Lead in bbls	6¼@6¾¢
Red Lead, American	7@7½¢
Red Venetian, English, dry	$1.65@$1.70
Red Venetian in oil; asst'd cans, 8¼¢	
kegs	7¼¢
Sipe's Japan Oil, in bbls, ℔ gal	34¢
Spirits Turpentine, in bbls., ℔ gal	35½¢
Asphaltum, Trinidad Refined, ℔ ton	$45
Tarred Felt, 1 Ply, ℔ 100 ℔	$1.60
Tarred Felt, 2 Ply, ℔ roll 108 sq. feet	$1.25
Tarred Felt, 3 Ply, ℔ roll of 108 sq. feet	$1.70
Roofing Pitch, ℔ bbl. of 300 ℔	$3.00

NEW YORK, DECEMBER 29, 1893.

The following quotations are for small lots.

Aluminum—

No. 2 Grade Metal (guaranteed over 94% pure Aluminum), in ton lots.....
℔ D, $0.70

No 1 (guaranteed to be 98 % pure and over), in ton lots .....℔ D .75
Lots less than 1 ton, 10¢ ℔ D additional.

Antimony—

Cookson.....℔ D, 10¾¢@11¢
Hallett's.....℔ D, 10¼¢@10½¢

Brass—

Planished.....net
Roll and Sheet.....35@40%

Brass and Copper Tubes

Brazed Brass Tubing—

List May 20, 1889.

	Per D.
Plain, to No. 20 inclusive, above 5-16 inch to 3 inch inclusive	$0.35
Plain, to No. 20, above 3 inch	45
Plain, 5-16 inch to No. 20	45
Plain, ¼ inch	60
Plain, 3-16 inch	1.00
Plain, ⅛ inch	1.50
Fancy Tubing to No. 20, inclu...	43

35@40%

Copper and Bronze Tubing—

8¢ ℔ D more than brass.

Bronze, Tobin—

Drawn Rods for Bolts, Forgings, &c

Over ¼ to 3½ inches inclusive....17¢ ℔ D
Over 3½ to 5 inches inclusive.....18¢ ℔ D

Piston Rods, Finished True, Smooth and Straight.

Over ¼ to 3½ inches inclusive....18¢ ℔ D
Over 3½ to 5 inches inclusive.....19¢ ℔ D

Clips—

Buffalo Damper: Nos. 1, $1.25; 2, 2.50 per doz.....40&10%

Conductors—

Corrugated. *Round or Square—*

Galvanized.....60%
Galvanized, Locked Joints.....60%
Tin.....60%

Spiral Riveted—

Galvanized.....50%

See also *Elbows and Shoes; Eave-Trough Miters; Strainers, Conductor.*

Conductor Strainers—See *Strainers, Conductor.*

Copper—

Bottoms, Pits and Flats....25@25&5%

Ingot.

Lake.....11¢
Ansonia Grade Arizona.....10¾¢
Ansonia Grade Casting.....10¢
Planished......net
Sheet and Bolt.....25&25&5%

Tubes—See *Seamless Brass Tubes.*

Coppers, Soldering—

See *Irons, Soldering,* in Current Hardware Prices.

Damper Clips Buffalo—

See Clips, Buffalo Damper.

Eave Troughs—

Lap or Slip Joint, Galvanised.....60&10%
Lap or Slip Joint Terne.....60%

Eave-Trough Mitres—

Lap or Slip Joint.....list, net

Elbows—

Plain Adjustable—

Tin.....70%
Galvanized.....70%

Crimped Tubing—

Re-Tinned or Galvanized.....35%

Stove-Pipe—

Buffalo Four-Piece.

4½	5	5½	6	7 inch,
$0.78	.87	.90	.99	1.20 per doz..20 %

Elbows and Shoes—

Flat Crimp.

Tin.....35%
Galvanized.....35%

Corrugated.
Flat Crimp.

Galvanized.....60%

Round or Square.

Tin.....60%
Galvanized.....60%

Iron, Sheet—

Black.

	Common American.	R. G. Cleaned American.
Nos. 10 to 16	℔ D, 2.70	3 ¢
Nos. 17 to 20	℔ D. 2.80	3.10¢
Nos. 21 to 24	℔ D, 2.90	3.20¢
Nos. 25 and 26	℔ D, 3	3.30¢
No. 27	℔ D, 3.10	3.40¢
No. 28	℔ D, 3.15	3.50¢
American B. B.	℔ D, 4¢@4½¢	

Russia, Planished, &c.

Genuine Russia, according to assortment.....℔ D, 11¾@12½¢
Patent Planished....℔ D, A, 10¢; B, 9¢, 5%
Craig Polished Sheet Steel.....℔ D, 8½¢

Galvanized.

	B. B.
Nos. 10 to 16	70%@70& 5%
Nos. 17 to 22	
Nos. 23 to 24	
Nos. 25 to 26	
No. 27	
No. 28	
Nos. 29 and 30	

Filter Joints—

Lee's.....33⅓

Lead—

American Pig	4¢@4¼¢
Bar	
Pipe	4½¢
Tin Lined Pipe	6½¢, 20%
Block Tin Pipe	15¢, 20%
Sheet	37½¢, 20%
Old Lead in exchange, 3½¢ ℔ D.	7¢, 20%

Metal Expanded—

Manufacturers' list No. 5.

Lathing	10%
Fencing, Painted Sheets	20%
Netting, Painted Sheets	20%
Door Mats, Galvanized	20%
Window Guards, Paneled	25%
Tree Guards, Paneled	15%

Mitres Eave-Trough—See *Eave-Trough Mitres.*

Paints Oils &c.—

Lead, Amn. White, in oil	6¾ @ 7¼
Lead, Red, bbls. and ⅛ bbls	6½ @ 7
Lead, Red, kegs	6¾ @ 7
Ocher, American	1 @ 1¼
Red, Venetian, American	1½ @ 2½

Linseed Oil:
Raw, ₩ gal..... @ .40
Boiled..... @ .43

Spirits Turpentine:
In bbls..... @ .32

Putty:
In barrels and ½ bbls..... .01⅝ @ .01¾
In tubs..... .01⅝ @ .01¾
In tin cans..... .01½ @ .02¼
In bladders..... .01⅞ @ .02¼

Roofing Material, &c.:
Asphaltum, Trinidad Refined, ₩ ton..... $30.00@$35.00
Asphaltum, Rock, ₩ ton..... $14.00
Coal Tar Felt, 1 Ply, ₩ ℔..... 2¢
Coal Tar Felt, 2 Ply, ₩ roll 108 sq. ft. $1.42½
Coal Tar Felt, 3 Ply, ₩ roll 108 sq. ft. $1.85
Roofing Pitch, ₩ bbl..... $2.26

Pipe, Drain 50%

Pipe and Fittings, Cast Iron Soil—

Cast-Iron Soil Pipe, Tarred, sizes 2 to 6 Inches, inclusive..... 60@60&10%
Other sizes..... 55@55&10%
Cast-Iron Fittings, Tarred, sizes 2 to 6 Inches..... 60@60&10%
Other sizes..... 55@55&10%

Pipe, Spiral—

Galvanized..... 60%
Tin..... 60%

Rock and Slag Wool—

	₩ ℔	₩ cub. foot
Slag Wool, ordinary	1¼	16¢
Slag Wool, extra	4½	38½¢
Rock Wool, ordinary	2½	27¢
Rock Wool, extra	7¼	43½¢

Rosin—

Cmonom and Good—Strained,
Rosin, C. & D..... ₩ bbl. $1.32@$1.34
Rosin, E. & F..... ₩ bbl. $1.35@$1.45
Rosin, G. & H..... ₩ bbl. $1.55@$1.85
Rosin, I. & K..... ₩ bbl. $1.85@$2.25
Rosin, M. & N..... ₩ bbl $2.80@$3.50

Seamless Brass Tubes..ne

Shoes and Elbows—See *Elbows and Shoes.*

Slate Roofing—

According to size, f.o.b. cars, Quarry Station.

Pennsylvania:
Best Bangor, ₩ sqr..... $3.25@$4.50
Pen Argyle, ₩ sqr..... 3.50@ 4.25
Peach Bottom, ₩ sqr..... 5.00@ 6.25
No. 1 Chapman, ₩ sqr..... 4.00@ 4.65
Lehigh Slates, ₩ sqr..... 3.00@ 4.50
Vermont:
Sea Green, ₩ sqr..... 2.70@ 3.20
Purple, ₩ sqr..... 3.50@ 4.50
Unfading Green, ₩ sqr..... 3.50@ 4.00
Red, ₩ sqr..... 9.75@12.00

Solder and Soldering Fluids—

Solder—

½ & ½..... 13½@14½¢
No. 1..... 11¾@12 ¢
Prices of Solder indicated by private brands vary according to composition.

Soldering Fluids—

Concentrated Soldering Flux.
f.o.b. New York.
In barrels, ₩ ℔..... 4¢
Smaller quantities, ₩ ℔..... 5¢

Gedney's Soldering Fluid.
In carboys or barrels, ₩ ℔..... 2¢
$1.50 for carboy or barrel; money refunded when returned.

Perfection Soldering Flux.
No charge for package.
8lbs., about 500 ℔, ₩ ℔..... 3½¢
½ bbls., about 300 ℔, ₩ ℔..... 4¢
Kegs, about 110 ℔, ₩ ℔..... 4¢ } 5% dis.
75¢ extra for keg.
Kegs, about 55 ℔, ₩ ℔..... 4¢

Yager's Soldering Salts.
½-℔ bottles, each..... 30¢
Large quantities, per ℔..... 40¢

Spelter—

Western Spelter..... 4¼¢
Bertha..... 8¼¢@9¢

Spiral Pipe—See *Pipe, Spiral.*

Stove-Pipe Elbows—*See Elbows, Stove Pipe.*

Stove Polish—See *Polish, Stove.*

Stove Trucks—See *Trucks, Stove.*

Strainers Conductor—

Galvanized..... 60%

Tin, Pigs and Bars—

Banca, pigs, ₩ ℔..... 22¢@22½¢
Straits, pigs, ₩ ℔..... 21½¢@22¢
Straits in bars, ₩ ℔..... 22½¢@23¢

Tin Plates—

American Terne Plates—

Alaska (re-squared) IC, 14 x 20..... $7.00
Alderly, extra quality, IC, 14 x 20..6.37½
Allegheny, IC, 14 x 20..... 6.12
" IX, 14 x 20..... 6.38
Apollo Roofing, IC, 14 x 20..... 6.25
" " IX, 14 x 20..... 7.25
Bonus, Extra Coated, IC, 14 x 20... 6.75
" " IX, 14 x 20.... 8.25
Buckeye, IC, 14 x 20..... 7.00
" IX, 14 x 20..... 8.25
Chicago, IC, 20 x 28..... 11.50
Central, IC, 14 x 20..... 5.37½
Climax, IC, 14 x 20..... 5.70
Columbia, IC, 14 x 20..... 7.00
Crescent, IC, 14 x 20..... 6.00
DeMilt's First New York, IC, 14 x 20. 5.75
" First New Jersey, IC, 14 x 20 5.50
" Mohawk, IC, 14 x 20..... 5.50
Dunlap's Double Dipped, IC, 14 x 20 8.25
" " " IX, 14 x 20 9.50
" Domestic, IC, 20 x 28 ... 12.00
" " IX, 20 x 28 ... 15.00
Empire, IC, 14 x 20..... 6.12½
Extra Central, IC, 14 x 20..... 5.62½
Flag, IC, 14 x 20..... 5.50
Fort Pitt, IC, 20 x 28..... 11.00
Globe, IC, 14 x 20..... 5.75
Hamilton's Best Redipped, IC, 14x20 9.25
" " " IX, 14x20 10.75
Hickory (Resquared), IC, 14 x 20..6.37½
Juno, IC, 14 x 20..... 5.75
Kensington, IC, 14 x 20..... 6.75
" IX, 14 x 20..... 8.00
Knoxall, IC, 14 x 20..... 6.00
Laufman's Apollo (Resquared), IC, 14 x 20..... 8.12
Laufman's Apollo (Resquared), IX, 14 x 20..... 9.37
Leominster, Extra Coated, IC, 14x20 7.75
Lion (Stamped), IC, 14 x 20..... 6.25
Lula, Best Charcoal, IC, 20 x 28 ...12.50
" " IX, 20 x 28....16.00
Manhattan, IC, 14 x 20..... 7.00
Maple, IC, 14 x 20..... 6.50
Merchant's Old Method (Resquared), IC, 14 x 20..... 9.50
Merchant's Roofing (Resquared), IC, 14 x 20..... 8.50
McKinley, IC, 20 x 28..... 12.00
" IX, 20 x 28..... 15.00
Neville, IC, 14 x 20..... 6.00
" IX, 14 x 20..... 7.25
N. F. Old Style, IC, 14 x 20..... 7.50
" " IX, 14 x 20..... 9.00
Old Colony, IC, 14 x 20..... 8.00
Optimus, Best Redipped, IC, 14 x 20 8.25
" " " IX, 14 x 20 9.50
Osceola, Hand Coated, IC, 14 x 20.. 8.25
" " " IX, 14 x 20.. 9.75
Palacio, IC, 14 x 20..... 5.55
Pennsylvania Old Method (Treble Coated), IC, 14 x 20..... 8.50
Phœnix, IC, 14 x 20..... 5.80
Scott's Extra Coated (Resquared), IC, 14 x 20..... 9.25
Scott's Extra Coated (Resquared), IX, 14 x 20..... 10.75
Taylor Old Style (Resquared), IC, 14 x 20..... 9.25
Taylor Roofing, IC, 14 x 20..... 8.00
Thomson's Puritan, IC, 14 x 20.....5.75
Tip Top, IC (Resquared), 14 x 20.... 6.62
" IX " 14 x 20.... 7.88
U. S. Monongahela, IC, 14 x 20..... 6.50
U. S. Redipped, IC, 14 x 20..... 9.25
Venux, IC, 14 x 20..... 5.60
Waldo Redipped, IC, 14 x 20..... 7.25
Westmoreland, IC, 14 x 20..... 6.25
Wilkinsburg Redipped, IC, 20 x 28.16.00
" " IX, 20 x 28.19.00
Willow, IC, 14 x 20..... 6.25

American Bright Plates—

Almond, IC, 14 x 20..... $6.25
Brilliant (Tissue Packed), IC, 14x20. 9.00
Climax, IC, 14 x 20..... 6.50
" IX, 14 x 20..... 8.00
Florence, IC, 14x20..... 6.75
Hazel, IC, 14x20..... 5.80
Linden, IC, 14x20..... 6.50
Merchant's Dipped, IC, 14x20..... 11.00
Merlon, IC, 14x20..... 6.75
Mint, IC, 14x20..... 6.00
Palma Xtra, IC, 14x20..... 7.25
Phœnix, IC, 14x20..... 6.25
" IX, 14x20..... 7.75
Royal, Extra, IC, 14x20..... 7.00
U. S., IC, 14x20..... 7.25

Imported Terne Plates—

Charcoal.
Dean Grade.—IC, 14 x 20.....@$5.50
20 x 28.....@11.00
IX, 14 x 20.....@ 6.75
20 x 28.....@13.50
Abercarne Grade.—IC, 14 x 20...@ 5.40
20 x 28.....@10.80
IX, 14 x 20...@ 6.62½
20 x 28.....@13.25

Imported Bright Plates—

Charcoal.
Duty: 2.2¢ ₩ ℔.
Melyn and Caland Grade. IC, 10 x 14.....@$6.50
" " IC, 12 x 12.....@ 6.75
" " IC, 14 x 20.....@ 6.50
" " IC, 20 x 28.....@13.00
" " IX, 10 x 14.....@ 8.50
" " IX, 12 x 12.....@ 8.75
" " IX, 14 x 20.....@ 8.50
" " IX, 20 x 28.....@17.00
" " DC, 12½ x 17.....@ 6.00
" " DX, 12½ x 17.....@ 8.00
Allaway Grade. IC, 10 x 14.....@ 6.00
" " IC, 12 x 12.....@ 6.25
" " IC, 14 x 20.....@ 6.00
" " IC, 20 x 28.....@12.00
" " IX, 10 x 14.....@ 7.50
" " IX, 12 x 12.....@ 7.75
" " IX, 14 x 20.....@ 7.50
" IX, 20 x 28.....@15.00
" DC, 12½ x 17.....@ 5.50
" " DX, 12½ x 17.....@ 7.00
Coke.
Steel Coke.—IC, 10x14, 14x20.....@$5.50
10x20.....@ 8.50
20x28.11.50@12.00
IX, 10x14, 14x20.....@ 6.75
B. V. Grade.—IC, 10x14, 14x20....@ 5.55

Imported Boiler Plates.—

IXX, 14x26..(112 sheets)..... ..@$13.50
IXX, 14x28..(112 sheets)..... ..@ 14.50
IXX, 14x31..(112 sheets)..... ..@ 16.00

Tinning—

Brass and Copper.....net

Tubing—

Tin..... 55%
Galvanized..... 55%

Brass and Copper.—

Standard List..... 35@40%

Troughs, Eave—See *Eave Troughs*

Trucks, Stove—

Improved Lock Frame, per doz....$15.00
Steel Lock Frame, per doz..... 18.00
Daisy Improved Pattern, ₩ doz..... 18.00

Zinc—

600 ℔ casks..... ₩ ℔ 5½¢
Per ℔..... 6¢@6½¢

It Is Reported—

That Geo. W. Redman's Hardware and Furniture store at Green's Landing, Maine, was considerably damaged by fire on the 9th inst. The damage to the building was $300 and to the goods $500. The former was insured, but there is no insurance on the latter.

That the Stewart & Sox Hardware Company, Albany, Ore., have been incorporated. The capital stock is $35,000, divided into 350 shares. About January 1 the company will move into their new quarters. The members of the company are E. F. Sox, C. H. Stewart and E. Redeker.

That the Tompkins Hardware Company and the Cary Hardware Company of Leadville, Col., have consolidated their interests, and will hereafter conduct business as one establishment. The capital stock of the new company has been placed at $100,000. The officers are as follows: H. H. Tompkins, president; John Harvey, vice-president; D. La Salle, treasurer; I. J. Cary, manager. The directors are H. H. Tompkins, John Harvey, L. H. Tompkins, D. La Salle and I. J. Cary.

That W. C. Grier has sold his Hardware store at Blunt, S. D., to N. E. Westover. Mr. Grier has removed to Plymouth, Wis., where he has purchased a Hardware stock and will continue the business.

That A. F. Anderson has purchased the Hardware business of H. L. Rich at Red Wing, Minn.

That M. A. Simpson has bought the stock of Hardware of H. Fishman, Mt. Ayr, Ill.

That J. H. Barlow and Chas. Turk of Woodward, Iowa, have bought the Hardware stock of E. M. Jones. They will hereafter conduct the business under the style of Barlow & Turk.

That Chas. B. Payne of Knox County has purchased the stock of Hardware of W. B. Keller, Brashear, Mo.

That the second and third stories of the building of the Fones Hardware Company, Little Rock, Ark., were burned out on the 20th inst. The loss, which was heavy, is fully covered by insurance.

That Harrington & Knight, Hardware dealers, who were burned out in the great fire at Fargo, N. D., some months since, have taken possession of their new quarters.

That a new Hardware and Tinware store will soon be opened at Wayne, Mich., by Drew & Doolittle.

That Mitchell's Hardware store at Packwood, Iowa, was destroyed by fire on the 21st inst.

That E. N. Falke, formerly of Massillon, Ohio, has opened up a Hardware store at 811 Monroe street, Toledo.

That J. W. Smith and P. J. Alexander have bought the Hardware store of J. S. Smith & Son, Farber, Mo.

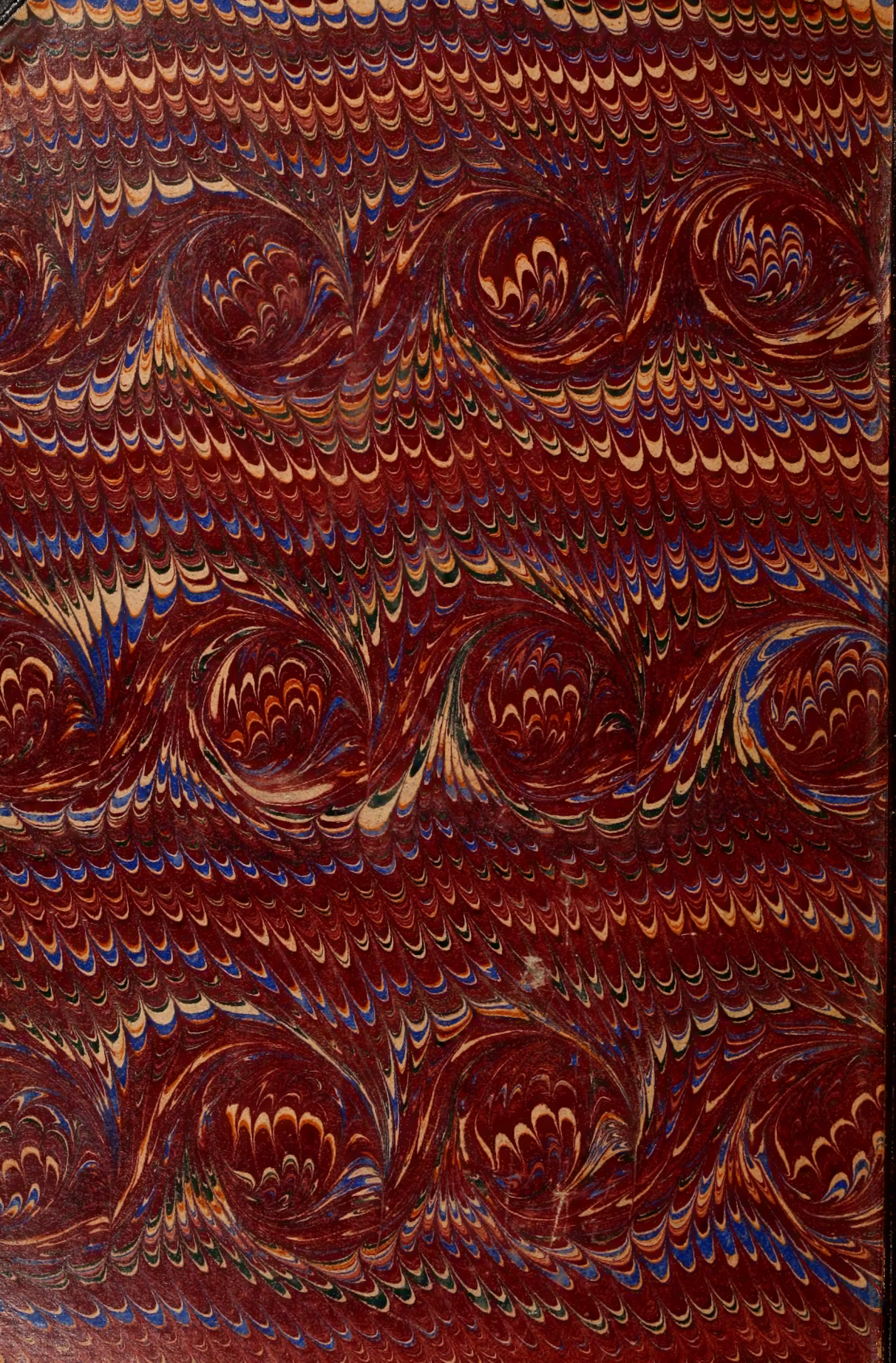
That Emerson & Fehlman, Steele City, Neb., have bought out the Hardware stock of F. Maw.

That J. P. Siner's Hardware store, at Shelburn, Ind., was destroyed by fire on the 19th inst.

That C. H. Cure, Pipestone, Minn., has sold his stock of Hardware to H. A. Marsh of Mason City, Iowa. Mr. Cure will continue with Mr. Marsh for the present.

That the Hardware store of Sires & Tulley, Trenton, Mo., was robbed on the 18th inst.

Price-Lists, Circulars, &c.

M. A. WOODBURY, Bradford, Pa.: Woodbury's Automatic Dry Chain Lubricator. The part resting on the chain is a small sack 1 x 5¼ inches in size, which is doubled over where it is held by a spring clamp, the long upper end of the clamp keeping the loose ends of the sack in place. The sack is filled with fine dry lubricant; the jar of the machine sifts the lubricant on to and into the chain, while the sack dusts the wearing parts of the chain.

THE ALASKA REFRIGERATOR COMPANY, Muskegon, Mich.: Alaska Refrigerators. The 1894 catalogue of the company is well printed on a fine quality of paper, and handsomely illustrated. At the front of the book is a full page view of their works, showing buildings of large extent, in connection with which are their lumber yards. The buildings, which are of brick and stone, include a main factory, three stories high, 340 feet long by 60 feet wide; main warehouse, two stories high, 400 x 60 feet, and another warehouse 100 x 200 feet, besides several smaller buildings. Illustrations are given of soft and hard wood Refrigerators, Apartment House Refrigerators, Sideboards, Butchers', Grocers' and Florists' Refrigerators, Double Coolers, &c.